ATOMIC DATA AND SPECTRAL LINE INTENSITIES FOR CA IX

E. Landi

Department of Atmospheric, Oceanic and Space Sciences, University of Michigan
Ann Arbor, Michigan 48109 USA

A. K. Bhatia

NASA/Goddard Space Flight Center
Greenbelt, Maryland 20771 USA

ABSTRACT

Electron impact collision strengths, energy levels, oscillator strengths and spontaneous radiative decay rates are calculated for Ca IX. We include in the calculations the 33 lowest configurations in the $n = 3, 4, 5$ complexes, corresponding to 283 fine structure levels in the $3l3l'$, $3l4l''$ and $3l4l'''$ configurations, where $l, l' = s, p, d$, $l'' = s, p, d, f$ and $l''' = s, p, d, f, g$. Collision strengths are calculated at five incident energies for all transitions: 5.8, 13.6, 24.2, 38.6 and 57.9 Ry above the threshold of each transition. An additional energy, very close to the transition threshold, has been added, whose value is between 0.0055 Ry and 0.23 Ry depending on the levels involved. Calculations have been carried out using the Flexible Atomic Code and the distorted wave approximation. Excitation rate coefficients are calculated as a function of electron temperature by assuming a Maxwellian electron velocity distribution. Using the excitation rate coefficients and the radiative transition rates calculated in the present work, statistical equilibrium equations for level populations are solved at electron densities covering the 10^8-10^{14} cm^{-3} range and at an electron temperature of $\log T_e$(K)=5.8, corresponding to the maximum abundance of Ca IX. Spectral line intensities are calculated, and their diagnostic relevance is discussed.

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Introduction

In recent years, we have been pursuing a program to calculate atomic data and transition rates for ions whose lines have been observed in astrophysical spectra, and yet have been neglected in the literature. There are two types of such ions: those for which a large number of calculations are available for low-energy configurations, but whose high-energy configurations have not been considered (i.e. C-like, N-like, O-like systems to name a few); or ions that have never or only seldom been studied. In the present work we focus Mg-like Ca, or Ca IX, which belongs to the second class of ions. This ion emits a number of allowed transitions in the EUV and soft X-ray ranges, some of which have been observed over the years in Extreme Ultraviolet solar spectra from quiet and active solar plasmas (Behring et al. [1], Dere [2], Vernazza & Reeves [3], Feldman et al. [4], Curdt et al. [5,6,7], Parenti et al. [8]). Laboratory measurements of Ca IX lifetimes were carried out by Träbert et al. [9], while energy levels were determined in several laboratory experiments by Parker & Phillips [10], Fawcett [11], Ekberg [12], Litzen & Redfors [13], Redfors [14] and Churilov et al. [15].

Some of the Ca IX can be used to form strongly density and temperature sensitive intensity ratios that can be applied to the measurement of the plasma parameters of solar and stellar plasmas. The strongest line in the Ca IX spectrum can also be used for emission measure and element abundance studies. Configurations with principal quantum number $n = 4, 5$ emit a number of lines in the soft X-rays between 45 and 80 Å that can also be used for plasma diagnostics.

Calculations of wavefunctions, level energies and radiative decay rates of Ca IX are relatively abundant in the literature, both as part of larger-scope calculations of data along the Mg-like sequence, or specifically dedicated to Ca IX. These calculations have been carried out by a number of authors using different techniques and atomic model (Fawcett [16], Kastner et al. [17], Christensen et al. [18], Tayal [19], Godefroid [20], Froese Fischer et al. [21], Stanek et al. [22], Zou & Froese Fischer [23], Tayal [24], Safronova et al. [25], Aashamar [26], Karpuskiene et al. [27]). Most of the calculations provided data only for levels in the $n = 3$ complex, but a few of them also included some $n = 4$ levels (Kastner et al. [17], Christensen et al. [18], Froese Fischer et al. [21], Aashamar [26], Karpuskiene et al. [27] and Tayal [24]). None of these authors provided data for $n = 5$ configurations.

Considerable attention has also been paid to the hyperfine-induced transitions from the $3s3p\ ^3\mathrm{P}_{0,2}$, and several calculations have been devoted to determine their A values (Marques et al. [28], Brage et al. [29], Kang et al. [30,31] and Andersson et al. [32]). One-photon radiative decays from the metastable $^3\mathrm{P}_0$ level can have consequences for the overall Ca IX level population and provide excellent density diagnostic intensity ratios.

Contrarily to radiative rates, the available datasets of electron impact excitation rate coefficients for Ca IX are surprisingly scarce. To our knowledge, the only complete dataset of collision strengths for 16 fine structure levels has been published by Christensen et al. [18]. No collision data have ever been published for the entire $n = 4$ complex, and none for any of the $n = 5$ levels. Furthermore, the available collision rate coefficients for the $n = 3$ complex are not complete.

The aim of the present work is to provide a complete dataset of energy levels, A-values and electron collisional excitation rates for Ca IX that allows to predict the spectrum of this ion and use it for plasma diagnostic purposes. We include all levels in the $n = 3, 4, 5$ complexes. While the present results are redundant for most of $n = 3, 4$ A values, they provide the first complete and up-to-date dataset that allows the calculation of spectral line intensities for all lines within the entire $n = 3, 4, 5$ complexes. We also discuss the diagnostic relevance of the strongest Ca IX lines.

Atomic data

To calculate a complete set of atomic data and transition rates and to assess its accuracy, we have used two suite of codes: the Flexible Atomic Code (FAC) by Gu [33] and the University College London (UCL) suite of codes (Eissner et al. [34]).

Acronym	Source
PP40	Parker & Phillips [10]
F70	Fawcett [11]
E71	Ekberg [12]
EB76	Edlen & Boden [35]
F76	Fawcett [36]
LR87	Litzen & Redfors [13]
R88	Redfors [14]
C89	Churilov et al. [15]
C04	Curdt et al. [7]

Table A. Literature sources where measured level energies are taken.

Lower	Upper levels			
Level	E'=0.0055	E'=0.022	E'=0.10	E'=0.23
1		2-4	5-45	46-283
2	3-4	5	6-64	65-283
3	4	5	6-64	65-283
4		5	6-64	65-283

Table B. Values of the energy E' used for the FAC electron-ion scattering calculations (in Ry).

FAC is a relativistic configuration interaction program. The radial wavefunctions for single-electron orbitals are obtained with a self-consistent field method based on Dirac formulation. The Dirac-Coulomb Hamiltonian is diagonalized to obtain energy levels and atomic state wavefunctions. The atomic model we used included all 33 configurations for the $n = 3, 4, 5$ complexes, for a total of 283 fine-structure levels. We did not attempt to calculate hyperfine transitions between the ground and the $3s3p\ ^3\mathrm{P}_{0,2}$ levels. We will refer to these results as the "FAC" dataset.

Energy values and radiative decay rates have also been calculated using the SUPERSTRUCTURE program, a part of the UCL suite, with the same atomic model used with FAC. In SUPERSTRUCTURE, wavefunctions are of configuration interaction type and each configuration is expanded in terms of Slater orbitals. The radial functions are calculated in a scaled Thomas-Fermi-Amaldi potential, which depends upon parameters λ which are determined variationally by optimizing the weighted sum of the term energies. The relativistic corrections are included by using the Breit-Pauli Hamiltonian as a perturbation to the nonrelativistic Hamiltonian. Energy levels, oscillator strengths, and radiative transition rates are calculated in intermediate coupling. We will refer to this dataset as the "SST" dataset. Both the FAC and SST energies are given in Table I, together with the observed values, where available. Table A lists the literature sources where the observed values are taken from.

The FAC code solves the scattering problem in the distorted wave approximation, as described in Gu ([33]). FAC calculations were carried out at six incident electron energies. The five highest energies were chosen to be 5.8, 13.6, 24.2,38.6 and 57.9 Ry above the threshold of each transition. The lowest energy was chosen to have a very small value E' above threshold in order to capture the near-threshold behavior of the collision strengths: the selected E' values change from transition to transition and are listed in Table B. Memory limitations prevented us from using the UCL code also to calculate the collision strengths.

The Ca IX collision strengths Ω_{ij}, the transition rates A_{ji}, and $g_i f_{ij}$, the absorption oscillator strengths multiplied by the statistical weight g_i of the lower level, are given in Table II for all transitions involving the

lowest 4 levels. Transition rates A_{ji} and $g_i f_{ij}$ values for all other transitions are given in Table III; collision strengths for these transitions are also available upon request.

The electron impact excitation rate coefficients (in $\mathrm{cm^3 s^{-1}}$) are obtained by averaging the collision strengths over the Maxwellian electron velocity distribution

$$C^e_{ij} = \frac{8.63 \times 10^{-6}}{g_i T_e^{1/2}} e^{-\frac{\Delta E_{ij}}{kT}} \int_0^\infty \Omega_{ij}(E_j)\ e^{-\frac{E_j}{kT_e}} d\left(\frac{E_j}{kT_e}\right) \tag{1}$$

where T_e is the electron temperature in K, ΔE_{ij} is the transition energy of the $i \rightarrow j$ transition, E_j is the incident energy with respect to the level j, and k is the Boltzmann constant. The de-excitation rates are given by the principle of detailed balance:

$$C^d_{ji} = \frac{g_i}{g_j}\ e^{\frac{\Delta E_{ij}}{kT_e}} C^e_{ij} \tag{2}$$

In order to carry out the integration in Eq. (1), it is necessary to know the collision strengths Ω across the whole energy range, from threshold to infinity. However, the present theoretical calculations only provide collision strengths at a few energy values, so that some interpolation/extrapolation technique is required in order to properly take into account the energy dependence of collision strengths. In the present work we have adopted the method described by Burgess and Tully [37] to extrapolate collision strengths to the high- and low-energy limit. This method has been used by Bhatia et al. [38] and details are given there.

Assessment of results

Table I reports the level energies calculated by both FAC and SST together with the experimental values. Theoretical energies obtained with the two calculations differ by less than 0.3% for all configurations except a few levels in the $3s3d$, $3p3d$ and $3d^2$ where differences rise up to 0.7%, with the FAC calculations being closer to observations than the SST ones. Table A reports the literature sources where the experimental energies have been taken from. A comparison between the two theoretical calculations shows that results are rather similar, except in a few cases where the FAC results are usually closer to the observations. Comparison of the FAC energies with the observed values shows that $n = 3$ singlet levels are within 1% of the measured values, whereas predicted triplet energies reproduce the latter to better than 0.2%. The only exception is the lowest excited configuration ($3s3p$) where differences rise to 0.75% and for the ^{3}P energies. FAC energies for the $n = 4$ and $n = 5$ levels are within 0.2% of the observed values. The $n = 5$ predicted energies reproduce the observed ones to better than 0.15%, with only one exception at 0.25%.

The only other possible direct comparisons of our calculations with observations are level lifetimes, which were measured by Träbert et al. [9]. The comparison with our results is shown in Table C, along with with several other calculations. With the only exception of levels 6 and 15, the present results agree with those of the most recent calculations. The first thing to notice is that the lifetime of level 5, giving rise to the strong resonance line at 466 Å, is within experimental uncertainties for all calculations. Measured lifetimes for all levels of the $3p^2$ and $3s3d$ configurations (levels 6 to 14) are larger than predicted by all calculations, which provide very similar results. The only exception is $3p^2\ ^1\mathrm{D}_2$ (level 6), for which only our SST calculation, Karpuskiene et al. [27] and Froese Fischer et al. [21] provide results in agreement with observations. The $3p3d\ ^3$F triplet (levels 15-17) provides mixed results, with some levels and some calculations giving better agreement. The FAC and SST results are largely the same, with the only exception of level 6 for which SST is superior to FAC.

Table D compares A values for the $n = 3$ levels from different calculations. We have compared results for the forbidden transitions from metastable levels in the $3s3p$ configuration, and allowed transitions giving rise to the strongest lines in the Ca IX spectrum. The forbidden transitions from the $3s3p$ calculation to the ground level show very good agreement (within 20%, mostly down to 5%) amongst all calculations, with the only

Level	T86	FAC	SST	F83	C86	S00	FF06	K04	T05
5	95±10	87.8	91.4	89.7	87.7	101	94.9	94.0	92.1
6	840±60	1013	893	1332	972.9	1060	848	872	
9	134±8	105	107.2	108.2	103.8	107	112.3	112.2	106.1
10	150±8	103.1	103.8	110.2	101.4	112	109.2	109.6	105.2
12	100±15	74.5	75.5	74.7	71.8	78.7	76.1	76.5	74.2
13	117±9	76.3	77.3	76.9	73.0	80.6	77.9	78.1	76.0
14	72±3	40.8	41.9	43.0	39.8	45.4	43.0	43.1	40.5
15	653±63	425	409	346		431	425	505	593
16	473±21	460	443	303		476	469	468	523
17	513±18	444	428	284		459	452	452	433

Table C. Comparison of observed and calculated lifetimes. T96: Träbert et al. [9] (observed); F83: Fawcett [16]; C86: Christensen et al. [18]; S00: Safronova et al. [25]; FF06: Froese Fischer et al. [21]; K04: Karpuskiene et al. [27]; T05: Tayal [24].

Transition	FAC	SST	F83	C86	T86	T05	ZFF01	A10	T98	FF06	K04	K10
3-4	4.380-1	4.564-1					4.539-1		4.570-1	4.564-1		4.539-1
5-6	6.475+8	7.360+8	7.315+8	9.890+7	7.160+8					7.168+8	7.250+8	
1-3	2.449+6	2.636+6		6.050+5			2.819+6	2.805+6	2.840+6	2.903+6		
1-4	4.834-1	5.059-1					5.055-1	5.060-1	5.100-1	4.965-1		4.902-1
4-6	2.287+8	2.600+8		2.500+8						3.139+8	2.880+8	
3-6	1.108+8	1.242+8		9.890+7						1.493+8	1.340+8	
4-8	3.839+9	3.775+9	3.946+9	3.910+9	4.030+9	3.795+9				3.635+9	3.640+9	
3-8	2.431+9	2.389+9	2.420+9	2.430+9	2.520+9	2.400+9				2.302+9	2.300+9	
4-9	7.045+9	6.899+9	6.870+9	7.150+9	7.350+9	7.001+9				6.582+9	6.590+9	
2-8	3.315+9	3.262+9	3.334+9	3.310+9	3.430+9	3.277+9				3.144+9	3.130+9	
3-9	2.434+9	2.386+9	2.366+9	2.450+9	2.530+9	2.428+9				2.268+9	2.270+9	
1-5	1.138+10	1.094+10	1.114+10	1.140+10	1.170+10	1.086+10	1.060+10	1.061+10		1.053+10		
5-14	2.448+10	2.382+10	2.324+10	2.510+10	2.690+10	2.468+10				2.325+10	2.320+10	
4-13	1.310+10	1.294+10	1.299+10	1.370+10	1.460+10	1.316+10				1.284+10	1.280+10	
3-11	5.622+9	5.557+9	5.561+9	5.840+9	6.250+9	5.653+9				5.507+9	5.480+9	
3-12	1.015+10	1.002+10	1.012+10	1.012+10	1.050+10	1.130+10	1.019+10			9.937+9	9.880+9	
2-11	7.639+9	7.534+9	7.552+9	7.890+9	8.460+9	7.665+9				7.481+9	7.420+9	

Table D. Comparison of A values for transitions within the $n = 3$ complex giving rise to observable lines. FAC: this work, FAC calculation; SST: this work, SUPERSTRUCTURE calculation; F83: Fawcett [16]; C86: Christensen et al. [18]; T86: Tayal [19]; T05: Tayal [24]; ZFF01: Zou & Froese Fischer [23]; A10: Andersson et al. [32]; FF06: Froese Fischer et al. [21]; K04: Karpuskiene et al. [27]; K10: Kang et al. [31].

Transition	FAC	SST	A88	C86	K04	T05	FF06
4-27	3.840+10	3.607+10	3.720+10	3.490+10	3.720+10	3.673+10	3.801+10
5-28	4.400+10	4.258+10	4.139+10	4.100+10	4.180+10	4.233+10	4.245+10
1-35	3.701+10	3.394+10	3.433+10		3.750+10	3.385+10	3.536+10
6-35	1.081+10	9.785+9	9.679+9		9.080+9	1.037+10	8.866+9
13-33	1.190+10	1.117+10	1.094+10		1.090+10	1.072+10	1.103+10
4-44	4.759+10	4.304+10			4.630+10	4.453+10	4.571+10
5-45	2.202+10	2.040+10			2.170+10	2.261+10	2.153+10
11-49	1.055+11	1.034+11			1.020+11		1.002+11
12-50	1.117+11	1.094+11			1.080+11		1.061+11
13-51	1.257+11	1.232+11			1.210+11		1.193+11
6-53	2.724+10	2.509+10			2.350+10	2.885+10	2.459+10
14-53	9.092+10	9.180+10			8.960+10	9.007+10	8.669+10

Table E. Comparison of A values for transitions within the $n = 4$ complex giving rise to the strongest lines. FAC: this work, FAC calculation; SST: this work, SUPERSTRUCTURE calculation; A88: Aashamar [26]; C86: Christensen et al. [18]; K04: Karpuskiene et al. [27]; T05: Tayal [24]; FF06: Froese Fischer et al. [21]

exception of Christensen et al. [18] which provide significant differences from all other calculations; such differences are likely to affect level population calculations. Differences in A values for allowed transitions are within 10% for all calculations, except in a few cases where our FAC calculations are lower than Froese Fischer et al. [21] and Karpuskiene et al. [27] by 20-30%, while the SST results agree better with the more recent earlier calculations. It is worth noting that Christensen et al. [18] underestimate by a factor 7 the A value for transition 5-6, giving rise to the line at 821 Å observed by SUMER in the solar spectrum (Curdt et al. [7]); a factor 4 difference also separates the Christensen et al. [18] A value for the important 1-3 transition (giving rise to the observed 691 Å spectral line) from all other results. These differences seem to indicate some problem in this data set. Table E reports the comparison between the A values for $n = 4 \rightarrow n = 3$ transitions giving rise to the strongest lines, and shows that all calculations agree to within 10%.

The only calculations of collision strengths we are aware of were made by Christensen et al. ([18] – C85), and Maxwellian-averaged collision strengths were provided by Pradhan [39]. They used the Distorted Wave approximation but tried to compensate in an approximate way for resonance excitation, while in the present work no effort has been made to account for resonances. The comparison shows very good agreement for all the allowed transitions within the C85 model, as well as for several intercombination and forbidden transitions. However, most of the forbidden transitions show significant differences from the present results: sometimes the differences consist of larger C85 collision strengths at the lowest incident electron energies, as expected from the neglect of resonances in the present calculation, but in many cases differences consist in constant shifts at all energies. In many other cases C85 collision strengths are lower than ours. Differences are particularly important for the 1-3 intercombination transition, giving rise to the observed 691.4 Å line, and for all transitions between the ground and the $3p^2$ transitions. These differences are likely to have significant effects on the overall level population and line intensity calculations.

Level Populations and Relative Line Intensities

In the absence of absorption of solar blackbody radiation and proton excitation, the level populations are obtained by solving the equations

$$\frac{dN_i}{dt} = -N_e N_i (\sum_{j>i} C^e_{ij} + \sum_{j<i} C^d_{ij}) + \sum_{j>i} N_j A_{ji} - N_i \sum_{j<i} A_{ij} + N_e (\sum_{j>i} N_j C^d_{ji} + \sum_{j<i} N_j C^e_{ji}) \qquad (3)$$

$$\frac{dN_i}{dt} = 0 \quad \text{for steady state} \tag{4}$$

where N_j is the number density of level j, N_e is the electron density, and A_{ji} (s^{-1}) is the spontaneous radiative transition rate from level j to level i. The equations have been solved at electron densities of logN_e(cm^{-3})=8, 9, 10, 11, 12, 13, and 14. Level populations and line intensities of various lines at log T$_e$=5.8, the temperature of maximum abundance of Ca IX (Bryans et al. [40]), are given in Tables IV and V, respectively. The intensity of an optically thin line for a radiative transition from level j to level i is given by $I_{ji} = n_j A_{ji}$ in photon units. Line intensities have been calculated and the values for the brightest lines are listed in Table V as a function of density.

Photoexcitation from background black-body radiation has negligible effects on Ca IX level populations at densities larger than logN_e(cm^{-3})=8, for black-body temperatures of 6000 K, typical of the Sun and solar-type stars, with a dilution factor of 0.35, typical of the innermost regions of stellar coronae. Below that density, the $3s3p$ ^{3}P level populations are affected by photoexcitation and this in turn alters the populations of many excited levels that provide lines useful for plasma diagnostics. In Tables IV and V we have omitted photoexcitation at all densities, but recommend the inclusion of photoexcitation in the analysis of Ca IX lines emitted by low density plasmas.

Comparison with observations

Ca IX lines can be used in several ways to measure the physical properties of the emitting plasma. Electron density measurements at densities typical of the lower corona or upper transition region (e.g. $\log N_e \simeq 8.0$ at around $\log T \simeq 5.7 - 6.0$) or more are possible only with the intensity ratio between the forbidden and the intercombination lines from the first excited configuration to the ground configuration: 676.29Å/691.42Å, or ^{3}P$_2$→^{1}S$_0$/^{3}P$_1$→^{1}S$_0$. Such dependence is due to the metastable nature of the ^{3}P$_2$ level which remains populated at higher densities than the ^{3}P$_1$ level, which has a larger A value to the ground. Comparison of the predicted ratio with the SUMER off-limb observations of Curdt et al. [7] yields a density of $\log N_e = 8.20 \pm 0.10$ and 7.80 ± 0.10 in quiet Sun and coronal hole areas, respectively, after taking into account the effects of photoexcitation. These values are consistent with earlier estimates. Several other intensity ratios are sensitive to the electron densities for $\log N_e < 8.0$.

Temperature-sensitive line intensity ratios can be formed using lines emitted by configurations with different n, because the excitation energies of the levels are different. However, the observable $n = 3$ lines are emitted at wavelengths longer than 200 Å so that they are far from $n = 4, 5$ lines: this makes it difficult for a single instrument to combine one $n = 3$ line with one $n = 4, 5$ line into a temperature-sensitive line intensity ratio. On the contrary, several line pairs emitted by $n = 4$ and $n = 5$ levels can be found at around 200 Å (e.g. 14-53/5-28: 178.57Å/201.85Å, potentially observable by the Hinode/EIS spectrometer, Culhane et al. [41]), as well as in the soft X-ray (e.g. 1-35/6-101: 121.33Å/120.15Å, 14-101/4-27: 133.34Å/163.23Å).

The Ca IX spectrum is dominated by the strong singlet $3s^2$ ^{1}S$_0$-$3s3p$ ^{1}P$_1$ at 466.24 Å. This line is very close to the even brighter Ne VII line at 465.22 Å, which is formed at similar temperatures (Bryans et al. [40]). Both lines are sensitive to the electron density in a similar way, so that their ratio can be used to determine the relative Ca/Ne abundance in solar coronal holes and quiet Sun. Such a ratio is important to invesigate the abundance anomaly in the solar corona known as the FIP effect (Feldman & Laming [42] and references therein). Also, the 466.24 Å line can be used to estimate the total amount of emitting plasma and in Differential Emission Measure studies.

Conclusions

In the present work we have calculated a complete set of energy levels, oscillator strengths, A values and collision strengths for 33 configurations of Ca IX, corresponding to all 283 fine structure levels in the $n = 3, 4, 5$ complexes. Energy levels and radiative data were also calculated using SUPERSTRUCTURE. We compared the radiative rates and level lifetimes we obtained with results from other calculations for a few key transitions, and with laboratory measurements, where available. To our knowledge, this is the first complete dataset that allows to calculate level populations and line intensities for $n = 4, 5$ and many $n = 3$ configurations. Our results allow the calculation of line emissivities of lines in the visible, UV and soft X-ray range, many of which for the first time, and to measure plasma parameters using line intensities and intensity ratios. We discuss the diagnostic applications of our calculations. The main limitation of the present calculations is the neglect of resonant excitation in the collision strengths; this process is expected to provide significant contributions and thus we recommend that future calculations be carried out to include it.

The present results will be distributed in the next release of the CHIANTI database (Dere et al. [43], Landi et al. [44]). We hope that the present results will be useful for the analysis of laboratory and astrophysical spectra.

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EXPLANATION OF TABLES

Table I. Calculated and Experimental Energy Levels for Ca IX

Level	A number assigned to each level
Configuration	The configuration, with $1s^2 2s^2 2p^6$ truncated
Term	The term designation of the level within the configuration
E_{obs}	Measured energies, from laboratory and solar spectra (see Table A).
E_{calc}	Calculated energy from FAC and SST, in cm^{-1}
Source	Literature sources used to determine the observed energy (following Table A).

Table II. Ca IX Oscillator Strengths, Radiative Decay Rates, and Collision Strengths for transitions involving the lowest four levels

Lower and Upper Level	The lower and upper levels, where the numbers refer to the Level listed in Table I
Oscillator Strength	gf, the (dimensionless) product of the statistical weight g of the lower level and the absorption oscillator strength f
Radiative Decay Rate	The spontaneous radiative decay rate A_{ji} in units of s^{-1}
Collision Strength	The dimensionless electron impact collision strength Ω at the energy above threshold (in Ry) given in the table heading. The lowest energy (E') changes depending on the lower level, as listed in Table B.

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions from all other levels

Lower and Upper Level	The lower and upper levels, where the numbers refer to the Level listed in Table I
Oscillator Strength	gf, the (dimensionless) product of the statistical weight g of the lower level and the absorption oscillator strength f
Radiative Decay Rate	The spontaneous radiative decay rate A_{ji} in units of s^{-1}

Table IV. Ca IX Fractional Level Populations

Den.	The electron density in cm^{-3}, in log values
Key	A number assigned to each level as given in Table I
Population	The fractional level population n_j as a function of electron density for an electron temperature of log T_e(K)=5.8: the sum of all fractional level populations is defined as unity.

Table V. Intensities of selected bright Ca IX lines

Den.	The electron density in cm^{-3}, in log values
j and i	The upper and lower levels, where numbers refer to the Level listed in Table I
Wavelength	The wavelengths in units of Å calculated from observed energies (when available) or theoretical energies.
Intensity	The intensity ($n_j A_{ji}$ in units of photon/s) for the indicated density given in the table heading and for an electron temperature of log T_e(K)=5.8.

Table I. Ca IX experimental and theoretical energy levels.

Level	Configuration	Term	E_{obs}	E_{FAC}	E_{SST}	Source
1	$3s^2$	$^1S_0$	0	0	0	
2	$3s3p$	$^3P_0$	143127	142044	141897	PP40, E71, LR87
3	$3s3p$	$^3P_1$	144630	143529	143420	C04
4	$3s3p$	$^3P_2$	147866	146721	146692	C04
5	$3s3p$	$^1P_1$	214482	217647	217812	E71, LR87
6	$3p^2$	$^1D_2$	336253	335364	336180	C04, E71, LR87
7	$3p^2$	$^3P_0$	339923	340352	340761	PP40, E71, LR87
8	$3p^2$	$^3P_1$	341827	342319	342660	PP40, E71, LR87
9	$3p^2$	$^3P_2$	345429	345772	346237	PP40, E71, LR87
10	$3p^2$	$^1S_0$	398895	402771	403589	F70, LR87
11	$3s3d$	$^3D_1$	412020	412268	414706	PP40, E71, LR87
12	$3s3d$	$^3D_2$	412154	412382	414905	PP40, E71, LR87
13	$3s3d$	$^3D_3$	412356	412565	415219	PP40, E71, LR87
14	$3s3d$	$^1D_2$	467633	472704	475158	E71, LR87
15	$3p3d$	$^3F_2$	563657	562509	565218	F70, LR87
16	$3p3d$	$^3F_3$	565705	564474	567309	F70, LR87
17	$3p3d$	$^3F_4$	568146	566911	569813	F70, LR87
18	$3p3d$	$^1D_2$	571899	570907	573715	F70, LR87
19	$3p3d$	$^3P_2$	598281	598952	601812	LR87
20	$3p3d$	$^3P_1$	599315	600049	602735	LR87
21	$3p3d$	$^3P_0$	601096	601764	604466	LR87
22	$3p3d$	$^3D_1$	602058	602748	605445	LR87
23	$3p3d$	$^3D_2$	602613	603272	606043	LR87
24	$3p3d$	$^3D_3$	602657	603354	606222	F70, LR87
25	$3p3d$	$^1F_3$	644812	650100	653146	LR87
26	$3p3d$	$^1P_1$	654169	660181	663284	LR87
27	$3s4s$	$^3S_1$	760494	758754	759002	PP40, E71, EB76
28	$3s4s$	$^1S_0$	774473	774337	774010	E71, EB76
29	$3s4p$	$^3P_0$		829142	828745	
30	$3s4p$	$^3P_1$		829426	829011	
31	$3d^2$	$^3F_2$	831162	830359	835666	LR87, C89
32	$3d^2$	$^3F_3$	831385	830485	835985	LR87, R88, C89
33	$3s4p$	$^3P_2$		830741	830263	
34	$3d^2$	$^3F_4$	831636	830772	836389	LR87, R88, C89
35	$3s4p$	$^1P_1$	832314	831823	831256	E71, EB76
36	$3d^2$	$^1G_4$	848606	850656	856244	R88, C89
37	$3d^2$	$^1D_2$	849262	850815	856244	R88, C89
38	$3d^2$	$^3P_1$	853097	853692	859105	C89
39	$3d^2$	$^3P_0$	853028	853698	858988	C89
40	$3d^2$	$^3P_2$	853229	853834	859105	C89
41	$3d^2$	$^1S_0$	900061	908334	913820	C89
42	$3s4d$	$^3D_1$	917157	916261	916286	PP40, E71, EB76
43	$3s4d$	$^3D_2$	917264	916388	916438	PP40, E71, EB76
44	$3s4d$	$^3D_3$	917481	916578	916666	E71, EB76
45	$3s4d$	$^1D_2$	921914	918207	918272	E71, EB76
46	$3p4s$	$^3P_0$	941430	941132	940500	E71, EB76
47	$3p4s$	$^3P_1$	942617	942369	941714	E71, EB76
48	$3p4s$	$^3P_2$	946336	945943	945235	E71, EB76

Table I. Ca IX experimental and theoretical energy levels.

Level	Configuration	Term	E_{obs}	E_{calc}	E_{SST}	Source
49	$3s4f$	$^3F_2$	954508	954150	953687	PP40, E71, EB76
50	$3s4f$	$^3F_3$	954531	954175	953724	PP40, E71, EB76
51	$3s4f$	$^3F_4$	954563	954213	953774	PP40, E71, EB76
52	$3p4s$	$^1P_1$		955767	954659	
53	$3s4f$	$^1F_3$	963058	964762	964248	E71, EB76
54	$3p4p$	$^1P_1$		997630	996913	
55	$3p4p$	$^3D_1$		1003558	1002857	
56	$3p4p$	$^3D_2$		1004842	1004154	
57	$3p4p$	$^3D_3$		1008148	1007366	
58	$3p4p$	$^3P_0$	1010847	1012260	1010432	PP40, E71
59	$3p4p$	$^3P_1$	1011980	1012962	1011405	PP40, E71
60	$3p4p$	$^3S_1$	1015597	1015457	1014617	PP40, E71
61	$3p4p$	$^3P_2$	1014350	1015620	1013775	PP40, E71
62	$3p4p$	$^1D_2$		1027107	1025219	
63	$3p4p$	$^1S_0$		1042482	1041137	
64	$3s5s$	$^3S_1$	1068775	1066981	1067544	PP40, E71
65	$3s5s$	$^1S_0$	1075141	1077817	1076503	PP40
66	$3p4d$	$^3D_1$		1090515	1090093	
67	$3p4d$	$^3D_2$		1090536	1090127	
68	$3p4d$	$^1D_2$		1091499	1090959	
69	$3p4d$	$^3D_3$		1091744	1091326	
70	$3s5p$	$^3P_1$		1095263	1095609	
71	$3s5p$	$^3P_0$		1095350	1095761	
72	$3s5p$	$^3P_2$		1095618	1096511	
73	$3s5p$	$^1P_1$	1097580	1096249	1096402	E71, EB76
74	$3p4d$	$^3F_2$		1097086	1096402	
75	$3p4d$	$^3F_3$		1097505	1096935	
76	$3p4d$	$^3F_4$		1100116	1099419	
77	$3p4d$	$^1F_3$		1100553	1100038	
78	$3p4d$	$^3P_2$		1109709	1108520	
79	$3p4d$	$^3P_1$		1110381	1109084	
80	$3p4d$	$^3P_0$		1110931	1109598	
81	$3p4d$	$^1P_1$		1116248	1114914	
82	$3p4f$	$^3G_3$		1122638	1121719	
83	$3p4f$	$^3G_4$	1124517	1124842	1123786	F76
84	$3p4f$	$^1F_3$	1125621	1125547	1124456	F76
85	$3p4f$	$^3G_5$	1126958	1127168	1126205	F76
86	$3p4f$	$^3F_2$		1128676	1127649	
87	$3p4f$	$^3F_3$		1129774	1128620	
88	$3p4f$	$^3F_4$	1130442	1130495	1129394	F76
89	$3p4f$	$^3D_3$		1135437	1135093	
90	$3p4f$	$^3D_2$	1135141	1135982	1135696	PP40
91	$3p4f$	$^3D_1$	1136718	1136360	1136109	PP40
92	$3s5d$	$^1D_2$	1139804	1138834	1139124	PP40, E71
93	$3p4f$	$^1G_4$	1139005	1141048	1140337	F76
94	$3s5d$	$^3D_3$	1145711	1145367	1144806	E71, EB76
95	$3s5d$	$^3D_2$	1145220	1145924	1145263	E71, EB76
96	$3s5d$	$^3D_1$	1145181	1146491	1145711	E71

Table I. Ca IX experimental and theoretical energy levels.

Level	Configuration	Term	E_{obs}	E_{calc}	E_{SST}	Source
97	$3p4f$	$^1D_2$		1154812	1153745	
98	$3s5f$	$^3F_2$	1159591	1158017	1158415	E71, EB76
99	$3s5f$	$^3F_3$	1159633	1158031	1158433	E71, EB76
100	$3s5f$	$^3F_4$	1159628	1158050	1158458	E71, EB76
101	$3s5f$	$^1F_3$	1160425	1162188	1162356	E71
102	$3s5g$	$^3G_3$		1166171	1166589	
103	$3s5g$	$^3G_4$		1166346	1166744	
104	$3s5g$	$^3G_5$		1166569	1166962	
105	$3s5g$	$^1G_4$		1174348	1174492	
106	$3d4s$	$^3D_1$		1188245	1189040	
107	$3d4s$	$^3D_2$		1188381	1189261	
108	$3d4s$	$^3D_3$		1188602	1189618	
109	$3d4s$	$^1D_2$		1196690	1197469	
110	$3p5s$	$^3P_0$		1242001	1242011	
111	$3p5s$	$^3P_1$		1242374	1242365	
112	$3d4p$	$^1D_2$		1245646	1246690	
113	$3p5s$	$^3P_2$		1246316	1246147	
114	$3p5s$	$^1P_1$		1247609	1247428	
115	$3d4p$	$^3D_1$		1249493	1250005	
116	$3d4p$	$^3D_2$		1249706	1250324	
117	$3d4p$	$^3D_3$		1250103	1250832	
118	$3d4p$	$^3F_2$		1251557	1252275	
119	$3d4p$	$^3F_3$		1252172	1252958	
120	$3d4p$	$^3F_4$		1252992	1253873	
121	$3d4p$	$^3P_0$		1262128	1262259	
122	$3d4p$	$^3P_1$		1262151	1262297	
123	$3d4p$	$^3P_2$		1262380	1262555	
124	$3d4p$	$^1F_3$		1265416	1265937	
125	$3p5p$	$^1P_1$		1271833	1271658	
126	$3p5p$	$^3D_1$		1274626	1274077	
127	$3d4p$	$^1P_1$		1274833	1274748	
128	$3p5p$	$^3D_2$		1275269	1274735	
129	$3p5p$	$^3P_0$		1276692	1275334	
130	$3p5p$	$^3P_1$		1278295	1277286	
131	$3p5p$	$^3D_3$		1278756	1278246	
132	$3p5p$	$^3P_2$		1280161	1278882	
133	$3p5p$	$^3S_1$		1281654	1280982	
134	$3p5p$	$^1D_2$		1286498	1284416	
135	$3p5p$	$^1S_0$		1291888	1289460	
136	$3p5d$	$^1D_2$		1315361	1314771	
137	$3p5d$	$^3D_2$		1316322	1315574	
138	$3p5d$	$^3D_1$		1316811	1315987	
139	$3p5d$	$^3D_3$		1317061	1316290	
140	$3p5d$	$^3F_2$		1319896	1319123	
141	$3p5d$	$^3F_3$		1320603	1319781	
142	$3p5d$	$^3F_4$		1321658	1320817	
143	$3p5d$	$^3P_2$		1323554	1322299	
144	$3d4d$	$^1F_3$		1324414	1326293	

Table I. Ca IX experimental and theoretical energy levels.

Level	Configuration	Term	E_{obs}	E_{calc}	E_{SST}	Source
145	$3p5d$	$^3P_1$		1324456	1323083	
146	$3p5d$	$^3P_0$		1325046	1323637	
147	$3p5d$	$^1F_3$		1326871	1325158	
148	$3d4d$	$^3D_1$		1328477	1330214	
149	$3d4d$	$^3D_2$		1328538	1330408	
150	$3d4d$	$^3D_3$		1328745	1330663	
151	$3d4d$	$^3G_3$		1329606	1330259	
152	$3d4d$	$^3G_4$		1329982	1331128	
153	$3d4d$	$^3G_5$		1330488	1332172	
154	$3d4d$	$^1P_1$		1330929	1332764	
155	$3p5f$	$^1F_3$		1331924	1332026	
156	$3p5d$	$^1P_1$		1332129	1329428	
157	$3p5g$	$^3H_4$		1332631	1332539	
158	$3p5f$	$^3F_3$		1332653	1333012	
159	$3p5f$	$^3F_2$		1333075	1332800	
160	$3p5g$	$^3H_5$		1333102	1332933	
161	$3p5f$	$^3F_4$		1333204	1333504	
162	$3p5g$	$^3G_4$		1334590	1334359	
163	$3p5g$	$^3G_3$		1334741	1334521	
164	$3p5f$	$^3G_3$		1336067	1335940	
165	$3p5f$	$^3G_4$		1336606	1336501	
166	$3p5g$	$^3H_6$		1336838	1336682	
167	$3p5g$	$^1G_4$		1337242	1336934	
168	$3p5g$	$^3G_5$		1337286	1336998	
169	$3p5f$	$^3G_5$		1337465	1337417	
170	$3p5g$	$^1H_5$		1338187	1337886	
171	$3d4d$	$^3S_1$		1339507	1341153	
172	$3p5f$	$^3D_3$		1339655	1339120	
173	$3p5f$	$^3D_2$		1340537	1339958	
174	$3p5f$	$^3D_1$		1341477	1340840	
175	$3p5g$	$^3F_4$		1341551	1341382	
176	$3p5g$	$^3F_3$		1341832	1341639	
177	$3p5g$	$^3F_2$		1343392	1343175	
178	$3p5g$	$^1F_3$		1343700	1343481	
179	$3p5f$	$^1G_4$		1343815	1343308	
180	$3d4d$	$^3F_2$		1344910	1345059	
181	$3d4d$	$^3F_3$		1345070	1345543	
182	$3d4d$	$^3F_4$		1345298	1345912	
183	$3p5f$	$^1D_2$		1346113	1345607	
184	$3d4d$	$^3P_1$		1357254	1357370	
185	$3d4d$	$^3P_0$		1357276	1357275	
186	$3d4d$	$^3P_2$		1357329	1357426	
187	$3d4d$	$^1D_2$		1358147	1358015	
188	$3d4d$	$^1G_4$		1360352	1360215	
189	$3d4f$	$^1G_4$		1361724	1362240	
190	$3d4f$	$^3H_4$		1366667	1367097	
191	$3d4f$	$^3F_2$		1366795	1367355	
192	$3d4f$	$^3F_4$		1366874	1367406	

Table I. Ca IX experimental and theoretical energy levels.

Level	Configuration	Term	E_{obs}	E_{calc}	E_{SST}	Source
193	$3d4f$	$^3F_3$		1367007	1367479	
194	$3d4f$	$^3H_5$		1367325	1367550	
195	$3d4f$	$^3H_6$		1367588	1368120	
196	$3d4f$	$^1D_2$		1371021	1371756	
197	$3d4f$	$^3G_3$		1379366	1380391	
198	$3d4f$	$^3G_5$		1379707	1380804	
199	$3d4f$	$^3G_4$		1379766	1380585	
200	$3d4f$	$^3D_1$		1381370	1382328	
201	$3d4f$	$^3D_3$		1381483	1382345	
202	$3d4f$	$^3D_2$		1381558	1382385	
203	$3d4f$	$^3P_2$		1384454	1385057	
204	$3d4f$	$^3P_1$		1384563	1385248	
205	$3d4f$	$^3P_0$		1384776	1385344	
206	$3d4f$	$^1F_3$		1387675	1388873	
207	$3d4d$	$^1S_0$		1388836	1387510	
208	$3d4f$	$^1P_1$		1399796	1401146	
209	$3d4f$	$^1H_5$		1403400	1404783	
210	$3d5s$	$^3D_1$		1487714	1488918	
211	$3d5s$	$^3D_2$		1487839	1489111	
212	$3d5s$	$^3D_3$		1488053	1489472	
213	$3d5s$	$^1D_2$		1490778	1491725	
214	$3d5p$	$^1D_2$		1515712	1516927	
215	$3d5p$	$^3D_1$		1516987	1517807	
216	$3d5p$	$^3D_2$		1517173	1518099	
217	$3d5p$	$^3D_3$		1517456	1518467	
218	$3d5p$	$^3F_2$		1518474	1519423	
219	$3d5p$	$^3F_3$		1518825	1519842	
220	$3d5p$	$^3F_4$		1519323	1520444	
221	$3d5p$	$^3P_2$		1522395	1523077	
222	$3d5p$	$^3P_1$		1522401	1522937	
223	$3d5p$	$^3P_0$		1522433	1522927	
224	$3d5p$	$^1F_3$		1525184	1525040	
225	$3d5p$	$^1P_1$		1528409	1527952	
226	$3d5d$	$^1F_3$		1553867	1555960	
227	$3d5d$	$^3D_1$		1555529	1557356	
228	$3d5d$	$^3D_2$		1555607	1557521	
229	$3d5d$	$^3D_3$		1555751	1557735	
230	$3d5d$	$^3G_3$		1556540	1558290	
231	$3d5d$	$^3G_4$		1556678	1558534	
232	$3d5d$	$^3G_5$		1556905	1558864	
233	$3d5d$	$^1P_1$		1556975	1558830	
234	$3d5d$	$^3S_1$		1560642	1562101	
235	$3d5d$	$^3F_2$		1561432	1561749	
236	$3d5d$	$^3F_3$		1561527	1561963	
237	$3d5d$	$^3F_4$		1561682	1562216	
238	$3d5d$	$^1D_2$		1567602	1566995	
239	$3d5d$	$^3P_0$		1567928	1567347	
240	$3d5d$	$^3P_1$		1567945	1567431	

Table I. Ca IX experimental and theoretical energy levels.

Level	Configuration	Term	E_{obs}	E_{calc}	E_{SST}	Source
241	$3d5d$	$^3P_2$		1568042	1567630	
242	$3d5d$	$^1G_4$		1568999	1568386	
243	$3d5f$	$^1G_4$		1570694	1572511	
244	$3d5f$	$^3H_4$		1571608	1573419	
245	$3d5f$	$^3H_5$		1571764	1573627	
246	$3d5f$	$^3H_6$		1571920	1573911	
247	$3d5f$	$^3F_2$		1572555	1574224	
248	$3d5f$	$^3F_3$		1572633	1574329	
249	$3d5f$	$^3F_4$		1572705	1574473	
250	$3d5f$	$^1D_2$		1575112	1576725	
251	$3d5g$	$^1H_5$		1577239	1578892	
252	$3d5f$	$^3G_3$		1577762	1579012	
253	$3d5g$	$^3H_4$		1577853	1579536	
254	$3d5f$	$^3G_4$		1577893	1579195	
255	$3d5g$	$^3H_5$		1577986	1579723	
256	$3d5f$	$^3G_5$		1578001	1579391	
257	$3d5g$	$^3H_6$		1578102	1579934	
258	$3d5g$	$^3G_3$		1578149	1579838	
259	$3d5g$	$^3G_4$		1578251	1579988	
260	$3d5g$	$^3G_5$		1578319	1580142	
261	$3d5g$	$^1F_3$		1579462	1581257	
262	$3d5f$	$^3D_1$		1579575	1580846	
263	$3d5f$	$^3D_2$		1579592	1580846	
264	$3d5f$	$^3D_3$		1579600	1580883	
265	$3d5g$	$^1G_4$		1579651	1581444	
266	$3d5g$	$^3I_5$		1579858	1581542	
267	$3d5g$	$^3F_2$		1579910	1581731	
268	$3d5g$	$^3F_3$		1579915	1581733	
269	$3d5g$	$^3F_4$		1579944	1581830	
270	$3d5g$	$^3I_6$		1580014	1581744	
271	$3d5g$	$^3I_7$		1580163	1582016	
272	$3d5f$	$^3P_2$		1580616	1581895	
273	$3d5f$	$^3P_1$		1580738	1582068	
274	$3d5f$	$^3P_0$		1580813	1582153	
275	$3d5f$	$^1F_3$		1581431	1582571	
276	$3d5g$	$^1I_6$		1582484	1584516	
277	$3d5g$	$^3D_3$		1583222	1585112	
278	$3d5g$	$^3D_2$		1583336	1585291	
279	$3d5g$	$^3D_1$		1583452	1585446	
280	$3d5g$	$^1D_2$		1584749	1586821	
281	$3d5d$	$^1S_0$		1585494	1581886	
282	$3d5f$	$^1H_5$		1588382	1589105	
283	$3d5f$	$^1P_1$		1589032	1589756	

Table II. Ca IX Oscillator Strengths, Radiative Decay Rates, and Collision Strengths for transitions involving the lowest 4 levels.

Low. Lev.	Upp. Lev.		Osc. Str.	Rad. Dec. Rate	Collision Strength Impact Electron Energy - Eo (Ry)				
i	j	Eo	gf	(1/s)	E	5.8	13.6	24.2	38.6	57.9
1	2	1.294+00	0.000+00	0.000+00	9.917-03	5.784-03	3.120-03	1.670-03	9.002-04	4.843-04
1	3	1.308+00	5.347-04	2.449+06	3.429-02	2.295-02	1.590-02	1.237-02	1.084-02	1.029-02
1	4	1.337+00	0.000+00	4.834-01	4.922-02	2.867-02	1.546-02	8.278-03	4.463-03	2.401-03
1	5	1.983+00	1.081+00	1.138+10	5.056+00	6.193+00	7.232+00	8.202+00	9.125+00	9.995+00
1	6	3.056+00	0.000+00	8.125+04	2.103-01	2.447-01	2.678-01	2.837-01	2.947-01	3.021-01
1	7	3.102+00	0.000+00	0.000+00	8.780-05	4.258-05	2.217-05	1.298-05	8.972-06	7.344-06
1	8	3.119+00	0.000+00	0.000+00	2.494-04	1.136-04	5.267-05	2.500-05	1.235-05	6.754-06
1	9	3.151+00	0.000+00	3.980+03	9.093-03	1.034-02	1.123-02	1.187-02	1.232-02	1.263-02
1	10	3.670+00	0.000+00	0.000+00	2.046-04	1.984-04	1.944-04	1.901-04	1.808-04	1.793-04
1	11	3.757+00	0.000+00	0.000+00	1.988-02	1.164-02	6.562-03	3.587-03	1.929-03	1.026-03
1	12	3.758+00	0.000+00	0.000+00	3.315-02	1.938-02	1.093-02	5.981-03	3.207-03	1.709-03
1	13	3.760+00	0.000+00	0.000+00	4.638-02	2.717-02	1.531-02	8.372-03	4.501-03	2.394-03
1	14	4.308+00	0.000+00	8.622+05	3.336-01	4.061-01	4.586-01	4.969-01	5.242-01	5.424-01
1	15	5.126+00	0.000+00	0.000+00	4.600-04	2.516-04	1.342-04	7.082-05	3.724-05	1.941-05
1	16	5.144+00	0.000+00	0.000+00	6.503-04	3.606-04	1.947-04	1.053-04	5.818-05	3.348-05
1	17	5.166+00	0.000+00	0.000+00	8.156-04	4.469-04	2.386-04	1.260-04	6.636-05	3.457-05
1	18	5.202+00	0.000+00	0.000+00	1.355-04	6.552-05	3.017-05	1.358-05	6.105-06	2.886-06
1	19	5.458+00	0.000+00	0.000+00	2.759-04	1.480-04	7.656-05	3.921-05	2.029-05	1.091-05
1	20	5.468+00	0.000+00	0.000+00	1.473-04	7.845-05	4.021-05	2.083-05	1.109-05	6.452-06
1	21	5.484+00	0.000+00	0.000+00	5.794-05	3.145-05	1.646-05	8.528-06	4.460-06	2.416-06
1	22	5.493+00	0.000+00	0.000+00	1.182-04	6.084-05	2.989-05	1.465-05	7.273-06	3.914-06
1	23	5.497+00	0.000+00	0.000+00	1.715-04	8.562-05	4.079-05	1.908-05	9.038-06	4.560-06
1	24	5.498+00	0.000+00	0.000+00	2.100-04	1.047-04	5.181-05	2.746-05	1.697-05	1.301-05
1	25	5.924+00	0.000+00	0.000+00	7.263-03	8.714-03	9.790-03	1.058-02	1.120-02	1.170-02
1	26	6.016+00	2.834-03	2.747+08	6.088-04	1.023-03	1.505-03	2.046-03	2.597-03	3.175-03
1	27	6.914+00	0.000+00	0.000+00	7.888-03	3.994-03	2.157-03	1.188-03	6.340-04	3.269-04
1	28	7.056+00	0.000+00	0.000+00	2.169-01	2.357-01	2.476-01	2.547-01	2.587-01	2.606-01
1	29	7.556+00	0.000+00	0.000+00	1.606-03	9.125-04	4.710-04	2.350-04	1.158-04	5.856-05
1	30	7.558+00	2.943-02	4.501+09	6.583-03	6.606-03	8.237-03	1.111-02	1.467-02	1.869-02
1	31	7.567+00	0.000+00	0.000+00	6.188-06	3.034-06	1.562-06	9.364-07	6.904-07	6.075-07
1	32	7.568+00	0.000+00	0.000+00	8.409-06	3.848-06	1.670-06	7.026-07	2.899-07	1.223-07
1	33	7.570+00	0.000+00	0.000+00	7.958-03	4.519-03	2.332-03	1.165-03	5.754-04	2.923-04
1	34	7.571+00	0.000+00	0.000+00	1.088-05	4.980-06	2.163-06	9.107-07	3.780-07	1.591-07
1	35	7.580+00	2.405-01	3.701+10	2.112-02	3.543-02	5.786-02	8.602-02	1.175-01	1.513-01
1	36	7.752+00	0.000+00	0.000+00	5.298-06	2.381-06	1.777-06	2.190-06	2.913-06	3.495-06
1	37	7.753+00	0.000+00	2.435+05	1.552-03	2.270-03	2.881-03	3.385-03	3.773-03	4.085-03
1	38	7.779+00	0.000+00	0.000+00	1.446-05	7.753-06	3.874-06	1.856-06	8.812-07	4.353-07
1	39	7.779+00	0.000+00	0.000+00	4.948-06	2.692-06	1.417-06	7.625-07	4.615-07	3.389-07
1	40	7.781+00	0.000+00	0.000+00	3.233-05	2.502-05	2.185-05	2.121-05	2.166-05	2.260-05
1	41	8.277+00	0.000+00	0.000+00	2.745-04	3.135-04	3.419-04	3.618-04	3.760-04	3.853-04
1	42	8.350+00	0.000+00	0.000+00	4.595-03	2.293-03	1.206-03	6.312-04	3.241-04	1.614-04
1	43	8.351+00	0.000+00	0.000+00	7.637-03	3.819-03	2.025-03	1.065-03	5.476-04	2.836-04
1	44	8.352+00	0.000+00	0.000+00	1.071-02	5.346-03	2.813-03	1.473-03	7.564-04	3.767-04
1	45	8.367+00	0.000+00	1.161+07	2.512-02	4.021-02	5.466-02	6.685-02	7.721-02	8.607-02
1	46	8.576+00	0.000+00	0.000+00	7.280-06	3.627-06	1.700-06	8.056-07	3.957-07	1.849-07

Table II. Ca IX Oscillator Strengths, Radiative Decay Rates, and Collision Strengths for transitions involving the lowest 4 levels.

Low. Lev.	Upp. Lev.		Osc. Str.	Rad. Dec. Rate	Collision Strength Impact Electron Energy - Eo (Ry)					
i	j	Eo	gf	(1/s)	E	5.8	13.6	24.2	38.6	57.9
1	47	8.587+00	4.111-05	8.118+06	4.588-05	3.432-05	2.970-05	2.920-05	3.173-05	3.552-05
1	48	8.620+00	0.000+00	0.000+00	3.416-05	1.704-05	7.995-06	3.796-06	1.866-06	8.683-07
1	49	8.695+00	0.000+00	0.000+00	1.118-02	5.755-03	2.880-03	1.418-03	6.813-04	3.146-04
1	50	8.695+00	0.000+00	0.000+00	1.551-02	8.066-03	4.020-03	1.982-03	9.534-04	4.407-04
1	51	8.695+00	0.000+00	0.000+00	2.012-02	1.036-02	5.183-03	2.553-03	1.226-03	5.663-04
1	52	8.710+00	7.766-04	1.577+08	6.259-04	5.977-04	6.076-04	6.356-04	7.025-04	7.808-04
1	53	8.792+00	0.000+00	0.000+00	7.551-02	9.977-02	1.177-01	1.298-01	1.374-01	1.419-01
1	54	9.091+00	0.000+00	0.000+00	3.419-05	1.543-05	7.374-06	3.817-06	2.044-06	1.020-06
1	55	9.145+00	0.000+00	0.000+00	4.472-05	2.210-05	1.171-05	6.590-06	3.893-06	2.129-06
1	56	9.157+00	0.000+00	0.000+00	7.463-05	3.766-05	2.082-05	1.268-05	8.120-06	5.354-06
1	57	9.187+00	0.000+00	0.000+00	9.309-05	4.638-05	2.482-05	1.418-05	8.478-06	4.684-06
1	58	9.224+00	0.000+00	0.000+00	3.977-05	3.525-05	3.382-05	3.346-05	3.331-05	3.321-05
1	59	9.231+00	0.000+00	0.000+00	6.157-05	2.959-05	1.487-05	7.708-06	3.966-06	2.039-06
1	60	9.254+00	0.000+00	0.000+00	9.897-05	4.897-05	2.543-05	1.343-05	6.942-06	3.663-06
1	61	9.255+00	0.000+00	0.000+00	6.488-05	3.094-05	1.624-05	9.690-06	6.896-06	5.429-06
1	62	9.360+00	0.000+00	1.560+04	1.294-04	1.129-04	1.171-04	1.203-04	1.373-04	1.446-04
1	63	9.500+00	0.000+00	0.000+00	8.002-03	8.848-03	9.436-03	9.826-03	1.006-02	1.020-02
1	64	9.723+00	0.000+00	0.000+00	2.867-03	1.436-03	7.734-04	4.300-04	2.330-04	1.197-04
1	65	9.822+00	0.000+00	0.000+00	3.843-02	4.271-02	4.575-02	4.783-02	4.917-02	5.003-02
1	66	9.938+00	3.625-03	9.586+08	1.833-04	2.983-04	4.900-04	7.568-04	1.071-03	1.411-03
1	67	9.938+00	0.000+00	0.000+00	1.427-04	8.244-05	4.311-05	2.167-05	1.064-05	5.094-06
1	68	9.946+00	0.000+00	0.000+00	5.199-05	2.815-05	1.472-05	7.559-06	3.901-06	2.004-06
1	69	9.949+00	0.000+00	0.000+00	7.711-05	5.545-05	4.477-05	4.071-05	3.989-05	4.044-05
1	70	9.981+00	1.747-02	4.658+09	1.924-03	2.054-03	2.694-03	3.824-03	5.254-03	6.843-03
1	71	9.982+00	0.000+00	0.000+00	5.480-04	3.196-04	1.672-04	8.441-05	4.149-05	1.995-05
1	72	9.984+00	0.000+00	0.000+00	2.376-03	1.387-03	7.259-04	3.669-04	1.806-04	8.703-05
1	73	9.990+00	7.554-02	2.019+10	3.478-03	5.997-03	1.004-02	1.559-02	2.212-02	2.912-02
1	74	9.997+00	0.000+00	0.000+00	1.429-04	8.216-05	4.566-05	2.493-05	1.340-05	7.144-06
1	75	1.000+01	0.000+00	0.000+00	2.427-04	2.009-04	1.811-04	1.753-04	1.763-04	1.810-04
1	76	1.002+01	0.000+00	0.000+00	2.885-04	1.667-04	9.299-05	5.092-05	2.744-05	1.464-05
1	77	1.003+01	0.000+00	0.000+00	3.467-04	3.905-04	4.306-04	4.702-04	5.049-04	5.358-04
1	78	1.011+01	0.000+00	0.000+00	9.897-04	5.428-04	2.720-04	1.355-04	6.805-05	3.448-05
1	79	1.012+01	9.922-04	2.720+08	5.473-04	3.544-04	2.732-04	2.791-04	3.311-04	4.061-04
1	80	1.012+01	0.000+00	0.000+00	1.549-04	8.422-05	4.199-05	2.087-05	1.051-05	5.350-06
1	81	1.017+01	2.447-02	6.780+09	1.716-03	2.371-03	3.580-03	5.322-03	7.391-03	9.595-03
1	82	1.023+01	0.000+00	0.000+00	4.683-04	2.075-04	9.656-05	4.679-05	2.208-05	1.000-05
1	83	1.025+01	0.000+00	0.000+00	8.298-04	3.867-04	2.029-04	1.221-04	8.315-05	6.591-05
1	84	1.026+01	0.000+00	0.000+00	2.262-04	9.876-05	4.497-05	2.148-05	1.020-05	4.837-06
1	85	1.027+01	0.000+00	0.000+00	1.135-03	4.994-04	2.319-04	1.123-04	5.251-05	2.346-05
1	86	1.029+01	0.000+00	4.410+04	1.037-04	9.573-05	1.047-04	1.215-04	1.370-04	1.513-04
1	87	1.030+01	0.000+00	0.000+00	1.438-04	6.226-05	2.801-05	1.321-05	6.435-06	3.204-06
1	88	1.030+01	0.000+00	0.000+00	1.486-04	7.258-05	4.182-05	3.005-05	2.606-05	2.477-05
1	89	1.035+01	0.000+00	0.000+00	2.585-03	1.207-03	6.022-04	3.031-04	1.502-04	7.135-05
1	90	1.035+01	0.000+00	6.656+04	2.142-03	1.081-03	6.160-04	4.103-04	3.083-04	2.675-04
1	91	1.036+01	0.000+00	0.000+00	1.390-03	6.534-04	3.284-04	1.665-04	8.308-05	3.983-05

Table II. Ca IX Oscillator Strengths, Radiative Decay Rates, and Collision Strengths for transitions involving the lowest 4 levels.

Low. Lev.	Upp. Lev.		Osc. Str.	Rad. Dec. Rate	Collision Strength Impact Electron Energy - Eo (Ry)				
i	j	Eo	gf	(1/s)	E	5.8	13.6	24.2	38.6	57.9
1	92	1.038+01	0.000+00	1.224+07	1.114-02	1.719-02	2.280-02	2.822-02	3.272-02	3.658-02
1	93	1.040+01	0.000+00	0.000+00	2.794-03	4.397-03	5.210-03	5.754-03	6.467-03	6.953-03
1	94	1.044+01	0.000+00	0.000+00	2.750-03	1.391-03	7.479-04	4.017-04	2.121-04	1.086-04
1	95	1.044+01	0.000+00	2.721+04	1.741-03	9.120-04	5.193-04	3.134-04	2.007-04	1.450-04
1	96	1.045+01	0.000+00	0.000+00	9.291-04	4.748-04	2.571-04	1.389-04	7.375-05	3.800-05
1	97	1.052+01	0.000+00	2.550+05	3.078-04	4.011-04	4.990-04	6.025-04	6.944-04	7.638-04
1	98	1.055+01	0.000+00	0.000+00	4.665-03	2.560-03	1.340-03	6.835-04	3.430-04	1.675-04
1	99	1.055+01	0.000+00	0.000+00	6.486-03	3.529-03	1.873-03	9.553-04	4.760-04	2.341-04
1	100	1.055+01	0.000+00	0.000+00	8.388-03	4.603-03	2.409-03	1.229-03	6.168-04	3.012-04
1	101	1.059+01	0.000+00	0.000+00	2.287-02	3.033-02	3.573-02	3.981-02	4.285-02	4.514-02
1	102	1.063+01	0.000+00	0.000+00	1.751-03	6.636-04	2.772-04	1.254-04	5.388-05	2.270-05
1	103	1.063+01	0.000+00	0.000+00	2.225-03	8.471-04	3.679-04	1.695-04	8.477-05	4.758-05
1	104	1.063+01	0.000+00	0.000+00	2.670-03	1.010-03	4.212-04	1.903-04	8.169-05	3.440-05
1	105	1.070+01	0.000+00	0.000+00	2.171-03	3.419-03	3.932-03	4.256-03	4.745-03	5.032-03
1	106	1.083+01	0.000+00	0.000+00	2.329-05	1.179-05	6.189-06	3.202-06	1.608-06	7.823-07
1	107	1.083+01	0.000+00	0.000+00	3.861-05	1.995-05	1.079-05	6.071-06	3.497-06	2.301-06
1	108	1.083+01	0.000+00	0.000+00	5.314-05	2.694-05	1.415-05	7.326-06	3.676-06	1.789-06
1	109	1.091+01	0.000+00	8.143+05	4.317-04	6.900-04	9.541-04	1.210-03	1.434-03	1.632-03
1	110	1.132+01	0.000+00	0.000+00	3.237-06	1.682-06	8.184-07	4.039-07	2.090-07	1.042-07
1	111	1.132+01	0.000+00	0.000+00	1.329-05	9.394-06	7.352-06	6.231-06	5.748-06	5.636-06
1	112	1.135+01	0.000+00	0.000+00	2.800-06	1.427-06	6.873-07	3.380-07	1.745-07	8.627-08
1	113	1.136+01	0.000+00	0.000+00	1.095-05	5.673-06	2.754-06	1.363-06	7.097-07	3.548-07
1	114	1.137+01	0.000+00	0.000+00	1.928-05	1.831-05	1.839-05	1.808-05	1.821-05	1.871-05
1	115	1.139+01	0.000+00	0.000+00	1.486-06	9.309-07	6.483-07	5.124-07	4.687-07	4.970-07
1	116	1.139+01	0.000+00	0.000+00	1.930-06	9.645-07	4.623-07	2.179-07	1.012-07	4.662-08
1	117	1.139+01	0.000+00	0.000+00	2.644-06	1.355-06	6.999-07	3.810-07	2.309-07	1.646-07
1	118	1.141+01	0.000+00	0.000+00	6.344-06	3.498-06	1.865-06	9.849-07	5.180-07	2.646-07
1	119	1.141+01	0.000+00	0.000+00	8.887-06	4.881-06	2.626-06	1.394-06	7.375-07	3.903-07
1	120	1.142+01	0.000+00	0.000+00	1.197-05	6.613-06	3.531-06	1.868-06	9.844-07	5.031-07
1	121	1.150+01	0.000+00	0.000+00	1.546-06	8.235-07	4.102-07	1.982-07	9.459-08	4.425-08
1	122	1.150+01	0.000+00	0.000+00	5.041-06	2.753-06	1.485-06	8.933-07	6.685-07	6.239-07
1	123	1.150+01	0.000+00	0.000+00	9.298-06	4.943-06	2.455-06	1.187-06	5.694-07	2.667-07
1	124	1.153+01	0.000+00	0.000+00	3.836-05	5.296-05	6.537-05	7.503-05	8.179-05	8.619-05
1	125	1.159+01	0.000+00	0.000+00	1.438-05	6.671-06	3.255-06	1.702-06	9.465-07	5.100-07
1	126	1.162+01	0.000+00	0.000+00	1.482-05	7.139-06	3.617-06	1.927-06	1.083-06	6.019-07
1	127	1.162+01	6.308-04	2.280+08	6.598-05	6.152-05	6.962-05	9.127-05	1.224-04	1.612-04
1	128	1.162+01	0.000+00	0.000+00	2.285-05	1.150-05	6.135-06	3.495-06	2.196-06	1.475-06
1	129	1.163+01	0.000+00	0.000+00	7.890-06	5.144-06	4.030-06	3.583-06	3.368-06	3.228-06
1	130	1.165+01	0.000+00	0.000+00	1.637-05	7.504-06	3.600-06	1.836-06	9.845-07	5.019-07
1	131	1.165+01	0.000+00	0.000+00	2.925-05	1.494-05	7.983-06	4.445-06	2.596-06	1.537-06
1	132	1.167+01	0.000+00	0.000+00	2.603-05	1.183-05	5.647-06	2.912-06	1.585-06	9.138-07
1	133	1.168+01	0.000+00	0.000+00	2.297-05	1.111-05	5.553-06	2.826-06	1.425-06	7.449-07
1	134	1.172+01	0.000+00	2.614+04	2.278-05	1.106-05	6.887-06	5.597-06	6.294-06	8.220-06
1	135	1.177+01	0.000+00	0.000+00	5.088-05	5.630-05	5.970-05	6.145-05	6.166-05	6.107-05
1	136	1.199+01	0.000+00	0.000+00	2.243-05	1.206-05	6.334-06	3.265-06	1.707-06	9.064-07

Table II. Ca IX Oscillator Strengths, Radiative Decay Rates, and Collision Strengths for transitions involving the lowest 4 levels.

Low. Lev.	Upp. Lev.		Osc. Str.	Rad. Dec. Rate	Collision Strength Impact Electron Energy - Eo (Ry)				
i	j	Eo	gf	(1/s)	E	5.8	13.6	24.2	38.6	57.9
1	137	1.200+01	0.000+00	0.000+00	2.474-05	1.340-05	7.092-06	3.717-06	1.956-06	1.042-06
1	138	1.200+01	1.535-05	5.916+06	1.195-05	7.906-06	6.343-06	6.207-06	6.892-06	7.981-06
1	139	1.200+01	0.000+00	0.000+00	3.788-05	2.159-05	1.273-05	8.272-06	6.141-06	5.152-06
1	140	1.203+01	0.000+00	0.000+00	2.688-05	1.477-05	7.973-06	4.262-06	2.277-06	1.210-06
1	141	1.203+01	0.000+00	0.000+00	4.024-05	2.244-05	1.229-05	6.790-06	3.897-06	2.320-06
1	142	1.204+01	0.000+00	0.000+00	7.002-05	3.956-05	2.217-05	1.229-05	6.735-06	3.610-06
1	143	1.206+01	0.000+00	0.000+00	2.850-05	1.604-05	8.852-06	4.871-06	2.736-06	1.546-06
1	144	1.207+01	0.000+00	0.000+00	1.860-06	7.547-07	2.981-07	1.229-07	6.107-08	3.409-08
1	145	1.207+01	0.000+00	0.000+00	1.825-05	1.084-05	6.851-06	4.864-06	4.104-06	3.815-06
1	146	1.207+01	0.000+00	0.000+00	5.939-06	3.351-06	1.859-06	1.030-06	5.815-07	3.304-07
1	147	1.209+01	0.000+00	0.000+00	4.054-05	3.507-05	3.766-05	4.363-05	4.959-05	5.515-05
1	148	1.211+01	0.000+00	0.000+00	1.567-06	7.760-07	4.026-07	2.170-07	1.228-07	6.763-08
1	149	1.211+01	0.000+00	0.000+00	2.614-06	1.295-06	6.763-07	3.691-07	2.128-07	1.227-07
1	150	1.211+01	0.000+00	0.000+00	3.695-06	1.821-06	9.422-07	5.095-07	2.893-07	1.600-07
1	151	1.212+01	0.000+00	0.000+00	2.017-05	1.019-05	5.076-06	2.573-06	1.302-06	6.211-07
1	152	1.212+01	0.000+00	0.000+00	1.530-05	7.831-06	4.187-06	2.536-06	1.710-06	1.363-06
1	153	1.212+01	0.000+00	0.000+00	9.798-06	4.708-06	2.259-06	1.110-06	5.382-07	2.456-07
1	154	1.213+01	0.000+00	0.000+00	2.769-06	1.306-06	6.013-07	2.792-07	1.311-07	5.946-08
1	155	1.214+01	0.000+00	0.000+00	3.116-05	1.508-05	7.168-06	3.477-06	1.777-06	9.416-07
1	156	1.214+01	6.938-04	2.738+08	1.008-04	1.396-04	1.937-04	2.555-04	3.225-04	3.930-04
1	157	1.214+01	0.000+00	0.000+00	1.605-05	7.199-06	3.198-06	1.364-06	6.091-07	2.717-07
1	158	1.214+01	0.000+00	0.000+00	3.732-05	1.811-05	8.651-06	4.232-06	2.152-06	1.130-06
1	159	1.215+01	0.000+00	0.000+00	2.775-05	2.183-05	2.159-05	2.342-05	2.608-05	2.826-05
1	160	1.215+01	0.000+00	0.000+00	1.921-05	1.300-05	1.146-05	1.238-05	1.315-05	1.357-05
1	161	1.215+01	0.000+00	0.000+00	4.791-05	2.668-05	1.678-05	1.273-05	1.115-05	1.100-05
1	162	1.216+01	0.000+00	0.000+00	8.201-06	2.938-06	1.039-06	4.032-07	1.878-07	1.028-07
1	163	1.216+01	0.000+00	0.000+00	6.945-06	5.253-06	5.764-06	6.665-06	7.453-06	8.003-06
1	164	1.218+01	0.000+00	0.000+00	4.305-05	2.191-05	1.093-05	5.539-06	2.876-06	1.475-06
1	165	1.218+01	0.000+00	0.000+00	6.152-05	3.204-05	1.658-05	9.094-06	5.102-06	3.173-06
1	166	1.218+01	0.000+00	0.000+00	2.411-05	1.103-05	4.966-06	2.125-06	9.380-07	4.087-07
1	167	1.219+01	0.000+00	0.000+00	8.286-06	3.272-06	1.300-06	5.281-07	2.499-07	1.296-07
1	168	1.219+01	0.000+00	0.000+00	1.354-05	6.675-06	3.910-06	3.113-06	2.869-06	2.762-06
1	169	1.219+01	0.000+00	0.000+00	1.060-04	5.738-05	3.010-05	1.586-05	8.321-06	4.108-06
1	170	1.219+01	0.000+00	0.000+00	1.868-05	2.096-05	2.606-05	3.284-05	3.685-05	3.894-05
1	171	1.221+01	0.000+00	0.000+00	4.090-06	2.139-06	1.101-06	5.602-07	2.851-07	1.479-07
1	172	1.221+01	0.000+00	0.000+00	9.223-05	4.676-05	2.316-05	1.169-05	5.799-06	2.793-06
1	173	1.222+01	0.000+00	0.000+00	7.449-05	4.517-05	3.256-05	2.694-05	2.569-05	2.559-05
1	174	1.222+01	0.000+00	0.000+00	4.326-05	2.204-05	1.096-05	5.548-06	2.751-06	1.316-06
1	175	1.223+01	0.000+00	0.000+00	1.860-05	7.270-06	2.776-06	1.117-06	4.374-07	1.605-07
1	176	1.223+01	0.000+00	0.000+00	1.680-05	1.914-05	2.497-05	3.009-05	3.402-05	3.669-05
1	177	1.224+01	0.000+00	0.000+00	1.106-05	4.346-06	1.664-06	6.720-07	2.610-07	9.102-08
1	178	1.224+01	0.000+00	0.000+00	1.902-05	2.654-05	3.681-05	4.511-05	5.128-05	5.544-05
1	179	1.225+01	0.000+00	0.000+00	6.524-05	9.204-05	1.244-04	1.518-04	1.760-04	2.004-04
1	180	1.226+01	0.000+00	1.057+04	1.684-05	2.270-05	2.868-05	3.422-05	3.927-05	4.293-05
1	181	1.226+01	0.000+00	0.000+00	3.678-06	1.764-06	8.042-07	3.581-07	1.583-07	7.270-08

Table II. Ca IX Oscillator Strengths, Radiative Decay Rates, and Collision Strengths for transitions involving the lowest 4 levels.

Low. Lev.	Upp. Lev.		Osc. Str.	Rad. Dec. Rate	Collision Strength Impact Electron Energy - Eo (Ry)				
i	j	Eo	gf	(1/s)	E	5.8	13.6	24.2	38.6	57.9
1	182	1.226+01	0.000+00	0.000+00	5.400-06	3.680-06	3.187-06	3.192-06	3.412-06	3.774-06
1	183	1.227+01	0.000+00	1.597+05	2.306-04	3.509-04	4.604-04	5.563-04	6.409-04	7.010-04
1	184	1.237+01	0.000+00	0.000+00	4.584-06	2.284-06	1.098-06	5.213-07	2.442-07	1.111-07
1	185	1.237+01	0.000+00	0.000+00	1.541-06	7.786-07	3.895-07	2.055-07	1.251-07	9.435-08
1	186	1.237+01	0.000+00	0.000+00	8.095-06	4.606-06	3.005-06	2.427-06	2.299-06	2.426-06
1	187	1.238+01	0.000+00	5.509+04	1.878-05	2.298-05	2.999-05	3.822-05	4.580-05	5.409-05
1	188	1.240+01	0.000+00	0.000+00	8.501-06	1.206-05	1.669-05	2.119-05	2.510-05	2.916-05
1	189	1.241+01	0.000+00	0.000+00	2.277-06	9.407-07	3.791-07	1.609-07	8.167-08	4.536-08
1	190	1.245+01	0.000+00	0.000+00	1.205-05	6.159-06	3.025-06	1.398-06	6.371-07	2.867-07
1	191	1.246+01	0.000+00	0.000+00	1.491-06	8.534-07	4.687-07	2.535-07	1.450-07	9.043-08
1	192	1.246+01	0.000+00	0.000+00	3.243-06	1.830-06	9.919-07	5.234-07	2.906-07	1.728-07
1	193	1.246+01	0.000+00	0.000+00	2.036-06	1.135-06	6.634-07	3.597-07	2.122-07	1.458-07
1	194	1.246+01	0.000+00	0.000+00	1.578-05	8.174-06	3.935-06	1.821-06	8.378-07	3.805-07
1	195	1.246+01	0.000+00	0.000+00	1.958-05	9.958-06	4.882-06	2.245-06	1.016-06	4.510-07
1	196	1.249+01	0.000+00	0.000+00	1.535-06	7.520-07	3.441-07	1.583-07	8.219-08	4.917-08
1	197	1.257+01	0.000+00	0.000+00	1.439-06	7.387-07	4.440-07	3.500-07	3.249-07	3.185-07
1	198	1.257+01	0.000+00	0.000+00	2.080-06	8.954-07	3.526-07	1.540-07	8.038-08	4.432-08
1	199	1.257+01	0.000+00	0.000+00	1.701-06	7.128-07	2.895-07	1.245-07	6.360-08	3.507-08
1	200	1.259+01	0.000+00	0.000+00	1.037-06	5.140-07	2.378-07	1.123-07	6.177-08	4.062-08
1	201	1.259+01	0.000+00	0.000+00	2.352-06	1.169-06	5.288-07	2.443-07	1.290-07	7.892-08
1	202	1.259+01	0.000+00	0.000+00	1.681-06	8.309-07	3.808-07	1.747-07	8.961-08	5.317-08
1	203	1.262+01	0.000+00	0.000+00	5.082-06	3.059-06	1.719-06	9.350-07	5.000-07	2.705-07
1	204	1.262+01	0.000+00	0.000+00	3.070-06	1.831-06	1.036-06	5.600-07	3.104-07	1.738-07
1	205	1.262+01	0.000+00	0.000+00	1.020-06	6.133-07	3.443-07	1.874-07	1.002-07	5.415-08
1	206	1.265+01	0.000+00	0.000+00	7.916-05	1.068-04	1.280-04	1.445-04	1.572-04	1.663-04
1	207	1.266+01	0.000+00	0.000+00	3.691-06	3.238-06	3.322-06	3.738-06	4.311-06	4.900-06
1	208	1.276+01	4.034-05	1.758+07	4.470-06	3.521-06	3.352-06	4.135-06	5.978-06	6.901-06
1	209	1.279+01	0.000+00	0.000+00	6.649-06	9.118-06	1.200-05	1.555-05	1.805-05	1.939-05
1	210	1.356+01	0.000+00	0.000+00	1.298-06	7.293-07	4.032-07	2.146-07	1.091-07	5.388-08
1	211	1.356+01	0.000+00	0.000+00	2.163-06	1.227-06	6.939-07	3.912-07	2.180-07	1.390-07
1	212	1.356+01	0.000+00	0.000+00	3.010-06	1.691-06	9.344-07	4.969-07	2.525-07	1.245-07
1	213	1.358+01	0.000+00	2.109+04	4.733-06	5.613-06	7.751-06	1.001-05	1.219-05	1.466-05
1	214	1.381+01	0.000+00	0.000+00	2.655-07	1.241-07	5.668-08	2.637-08	1.257-08	5.488-09
1	215	1.382+01	0.000+00	0.000+00	3.535-07	1.784-07	8.975-08	4.857-08	3.036-08	2.348-08
1	216	1.383+01	0.000+00	0.000+00	5.821-07	2.867-07	1.354-07	6.310-08	2.924-08	1.256-08
1	217	1.383+01	0.000+00	0.000+00	8.213-07	4.067-07	1.950-07	9.458-08	4.864-08	2.667-08
1	218	1.384+01	0.000+00	0.000+00	8.492-07	4.723-07	2.585-07	1.414-07	7.702-08	4.180-08
1	219	1.384+01	0.000+00	0.000+00	1.196-06	6.684-07	3.662-07	1.987-07	1.097-07	6.076-08
1	220	1.385+01	0.000+00	0.000+00	1.555-06	8.671-07	4.757-07	2.604-07	1.421-07	7.706-08
1	221	1.387+01	0.000+00	0.000+00	1.336-06	7.221-07	3.717-07	1.843-07	8.806-08	4.125-08
1	222	1.387+01	0.000+00	0.000+00	8.151-07	4.482-07	2.404-07	1.299-07	7.448-08	4.845-08
1	223	1.387+01	0.000+00	0.000+00	2.674-07	1.445-07	7.438-08	3.687-08	1.763-08	8.295-09
1	224	1.390+01	0.000+00	0.000+00	2.266-06	2.651-06	3.476-06	4.475-06	5.332-06	6.062-06
1	225	1.393+01	0.000+00	0.000+00	5.402-06	5.477-06	5.769-06	6.157-06	6.607-06	7.109-06
1	226	1.416+01	0.000+00	0.000+00	7.840-07	3.415-07	1.434-07	5.974-08	2.617-08	1.216-08

Table II. Ca IX Oscillator Strengths, Radiative Decay Rates, and Collision Strengths for transitions involving the lowest 4 levels.

Low. Lev.	Upp. Lev.		Osc. Str.	Rad. Dec. Rate	Collision Strength Impact Electron Energy - Eo (Ry)				
i	j	Eo	gf	(1/s)	E	5.8	13.6	24.2	38.6	57.9
1	227	1.418+01	0.000+00	0.000+00	7.354-07	3.571-07	1.740-07	8.583-08	4.303-08	2.178-08
1	228	1.418+01	0.000+00	0.000+00	1.219-06	5.919-07	2.886-07	1.425-07	7.148-08	3.607-08
1	229	1.418+01	0.000+00	0.000+00	1.703-06	8.261-07	4.022-07	1.984-07	9.932-08	5.024-08
1	230	1.418+01	0.000+00	0.000+00	1.634-06	7.878-07	3.784-07	1.833-07	8.733-08	4.062-08
1	231	1.419+01	0.000+00	0.000+00	2.115-06	1.020-06	4.885-07	2.350-07	1.129-07	5.288-08
1	232	1.419+01	0.000+00	0.000+00	2.585-06	1.247-06	5.991-07	2.905-07	1.383-07	6.445-08
1	233	1.419+01	0.000+00	0.000+00	1.160-06	5.544-07	2.571-07	1.189-07	5.567-08	2.558-08
1	234	1.422+01	0.000+00	0.000+00	2.048-06	1.095-06	5.805-07	3.051-07	1.593-07	8.476-08
1	235	1.423+01	0.000+00	0.000+00	6.683-07	2.953-07	1.260-07	5.410-08	2.518-08	1.268-08
1	236	1.423+01	0.000+00	0.000+00	9.393-07	4.138-07	1.754-07	7.344-08	3.216-08	1.459-08
1	237	1.423+01	0.000+00	0.000+00	1.211-06	5.354-07	2.271-07	9.515-08	4.217-08	1.943-08
1	238	1.429+01	0.000+00	0.000+00	3.273-06	2.604-06	2.439-06	2.406-06	2.520-06	2.682-06
1	239	1.429+01	0.000+00	0.000+00	5.646-07	2.832-07	1.432-07	7.985-08	5.619-08	5.151-08
1	240	1.429+01	0.000+00	0.000+00	1.667-06	8.168-07	3.860-07	1.807-07	8.472-08	3.864-08
1	241	1.429+01	0.000+00	0.000+00	2.809-06	1.449-06	7.708-07	4.521-07	3.110-07	2.532-07
1	242	1.430+01	0.000+00	0.000+00	1.452-06	1.248-06	1.430-06	1.602-06	1.792-06	1.985-06
1	243	1.431+01	0.000+00	0.000+00	5.442-07	2.308-07	9.260-08	3.742-08	1.690-08	9.168-09
1	244	1.432+01	0.000+00	0.000+00	1.320-06	6.695-07	3.319-07	1.613-07	7.680-08	3.580-08
1	245	1.432+01	0.000+00	0.000+00	1.633-06	8.263-07	4.139-07	2.016-07	9.459-08	4.434-08
1	246	1.432+01	0.000+00	0.000+00	1.949-06	9.885-07	4.904-07	2.387-07	1.137-07	5.320-08
1	247	1.433+01	0.000+00	0.000+00	3.540-07	1.515-07	6.004-08	2.406-08	1.057-08	5.807-09
1	248	1.433+01	0.000+00	0.000+00	4.920-07	2.108-07	8.611-08	3.484-08	1.579-08	9.467-09
1	249	1.433+01	0.000+00	0.000+00	6.364-07	2.698-07	1.091-07	4.410-08	1.905-08	1.054-08
1	250	1.435+01	0.000+00	0.000+00	9.042-07	4.311-07	1.921-07	8.374-08	3.883-08	2.056-08
1	251	1.437+01	0.000+00	0.000+00	1.279-07	4.610-08	1.665-08	7.120-09	3.590-09	1.814-09
1	252	1.438+01	0.000+00	0.000+00	4.857-07	2.205-07	1.049-07	6.046-08	4.576-08	4.050-08
1	253	1.438+01	0.000+00	0.000+00	1.149-07	4.709-08	2.077-08	1.225-08	9.190-09	8.146-09
1	254	1.438+01	0.000+00	0.000+00	6.139-07	2.607-07	1.046-07	4.233-08	1.925-08	1.046-08
1	255	1.438+01	0.000+00	0.000+00	1.429-07	5.454-08	2.069-08	8.952-09	4.406-09	2.167-09
1	256	1.438+01	0.000+00	0.000+00	7.527-07	3.178-07	1.287-07	5.185-08	2.389-08	1.289-08
1	257	1.438+01	0.000+00	0.000+00	1.489-07	5.454-08	1.961-08	8.757-09	4.831-09	2.464-09
1	258	1.438+01	0.000+00	0.000+00	2.119-07	9.960-08	4.573-08	2.020-08	8.653-09	3.587-09
1	259	1.438+01	0.000+00	0.000+00	2.617-07	1.261-07	5.859-08	2.932-08	1.584-08	1.067-08
1	260	1.438+01	0.000+00	0.000+00	3.134-07	1.438-07	6.596-08	2.927-08	1.254-08	5.318-09
1	261	1.439+01	0.000+00	0.000+00	2.501-07	1.086-07	4.443-08	1.891-08	9.481-09	4.918-09
1	262	1.439+01	0.000+00	0.000+00	6.943-07	3.360-07	1.524-07	6.742-08	3.181-08	1.752-08
1	263	1.439+01	0.000+00	0.000+00	1.162-06	5.635-07	2.556-07	1.132-07	5.278-08	2.785-08
1	264	1.439+01	0.000+00	0.000+00	1.620-06	8.170-07	4.081-07	2.247-07	1.519-07	1.240-07
1	265	1.439+01	0.000+00	0.000+00	7.141-07	8.744-07	1.123-06	1.273-06	1.394-06	1.529-06
1	266	1.440+01	0.000+00	0.000+00	4.546-07	1.781-07	7.829-08	3.589-08	1.594-08	6.650-09
1	267	1.440+01	0.000+00	0.000+00	2.033-07	8.805-08	3.829-08	1.954-08	1.334-08	1.062-08
1	268	1.440+01	0.000+00	0.000+00	2.801-07	1.211-07	4.897-08	2.115-08	1.071-08	5.701-09
1	269	1.440+01	0.000+00	0.000+00	4.239-07	2.936-07	2.612-07	2.607-07	2.727-07	2.923-07
1	270	1.440+01	0.000+00	0.000+00	5.404-07	2.101-07	9.440-08	4.497-08	1.993-08	9.475-09
1	271	1.440+01	0.000+00	0.000+00	6.301-07	2.466-07	1.085-07	4.970-08	2.200-08	9.119-09

Table II. Ca IX Oscillator Strengths, Radiative Decay Rates, and Collision Strengths for transitions involving the lowest 4 levels.

Low. Lev.	Upp. Lev.		Osc. Str.	Rad. Dec. Rate	Collision Strength Impact Electron Energy - Eo (Ry)				
i	j	Eo	gf	(1/s)	E	5.8	13.6	24.2	38.6	57.9
1	272	1.440+01	0.000+00	0.000+00	2.770-06	1.601-06	8.711-07	4.559-07	2.321-07	1.165-07
1	273	1.440+01	0.000+00	0.000+00	1.676-06	9.700-07	5.258-07	2.786-07	1.397-07	7.213-08
1	274	1.441+01	0.000+00	0.000+00	5.635-07	3.260-07	1.776-07	9.297-08	4.738-08	2.378-08
1	275	1.441+01	0.000+00	0.000+00	9.153-06	1.342-05	1.727-05	2.032-05	2.244-05	2.389-05
1	276	1.442+01	0.000+00	0.000+00	1.501-07	2.508-07	3.376-07	4.047-07	4.473-07	5.077-07
1	277	1.443+01	0.000+00	0.000+00	8.881-07	4.884-07	2.574-07	1.263-07	5.875-08	2.723-08
1	278	1.443+01	0.000+00	0.000+00	6.397-07	3.592-07	2.052-07	1.210-07	8.374-08	6.409-08
1	279	1.443+01	0.000+00	0.000+00	3.799-07	2.086-07	1.100-07	5.390-08	2.502-08	1.159-08
1	280	1.444+01	0.000+00	0.000+00	9.772-07	2.055-06	3.192-06	4.718-06	5.638-06	6.613-06
1	281	1.445+01	0.000+00	0.000+00	2.842-06	3.055-06	3.386-06	3.802-06	4.284-06	4.788-06
1	282	1.447+01	0.000+00	0.000+00	6.157-07	7.894-07	1.060-06	1.399-06	1.776-06	2.064-06
1	283	1.448+01	2.781-05	1.562+07	4.418-06	3.602-06	3.117-06	2.706-06	2.820-06	2.653-06
2	3	1.353-02	0.000+00	0.000+00	8.447-02	4.400-02	2.368-02	1.291-02	7.024-03	3.785-03
2	4	4.262-02	0.000+00	3.336-05	2.820-01	2.508-01	2.433-01	2.415-01	2.414-01	2.422-01
2	5	6.889-01	0.000+00	0.000+00	1.398-02	7.016-03	3.591-03	1.855-03	9.641-04	5.033-04
2	6	1.762+00	0.000+00	0.000+00	2.873-02	1.650-02	8.887-03	4.743-03	2.535-03	1.351-03
2	7	1.807+00	0.000+00	0.000+00	5.572-03	3.220-03	1.733-03	9.269-04	4.997-04	2.698-04
2	8	1.825+00	3.717-01	3.315+09	1.992+00	2.429+00	2.826+00	3.196+00	3.547+00	3.876+00
2	9	1.857+00	0.000+00	0.000+00	2.732-03	1.558-03	8.307-04	4.428-04	2.394-04	1.303-04
2	10	2.376+00	0.000+00	0.000+00	1.405-03	8.081-04	4.344-04	2.314-04	1.237-04	6.602-05
2	11	2.462+00	4.705-01	7.639+09	1.526+00	1.895+00	2.238+00	2.560+00	2.868+00	3.162+00
2	12	2.463+00	0.000+00	0.000+00	2.205-02	1.187-02	6.195-03	3.213-03	1.670-03	8.728-04
2	13	2.465+00	0.000+00	0.000+00	3.662-02	3.463-02	3.535-02	3.718-02	3.949-02	4.166-02
2	14	3.013+00	0.000+00	0.000+00	1.031-02	5.359-03	2.747-03	1.411-03	7.312-04	3.839-04
2	15	3.832+00	0.000+00	2.177+05	1.690-01	1.974-01	2.177-01	2.325-01	2.431-01	2.502-01
2	16	3.849+00	0.000+00	0.000+00	1.355-02	7.912-03	4.445-03	2.425-03	1.301-03	6.891-04
2	17	3.872+00	0.000+00	0.000+00	1.699-04	1.214-04	1.114-04	1.154-04	1.238-04	1.324-04
2	18	3.908+00	0.000+00	1.391+04	1.295-02	1.330-02	1.368-02	1.408-02	1.443-02	1.471-02
2	19	4.164+00	0.000+00	1.953+05	1.001-01	1.180-01	1.310-01	1.407-01	1.477-01	1.524-01
2	20	4.174+00	0.000+00	0.000+00	5.172-03	3.046-03	1.724-03	9.453-04	5.096-04	2.724-04
2	21	4.189+00	0.000+00	0.000+00	1.925-04	1.969-04	1.981-04	1.975-04	1.959-04	1.948-04
2	22	4.198+00	0.000+00	0.000+00	7.989-04	4.742-04	2.701-04	1.487-04	8.039-05	4.304-05
2	23	4.203+00	0.000+00	4.580+04	2.084-02	2.505-02	2.810-02	3.032-02	3.191-02	3.298-02
2	24	4.204+00	0.000+00	0.000+00	4.094-03	2.416-03	1.370-03	7.515-04	4.053-04	2.166-04
2	25	4.630+00	0.000+00	0.000+00	7.989-03	4.616-03	2.570-03	1.394-03	7.454-04	3.939-04
2	26	4.722+00	0.000+00	0.000+00	1.960-03	1.151-03	6.506-04	3.571-04	1.933-04	1.048-04
2	27	5.620+00	8.978-02	7.592+09	1.708-02	3.164-02	4.865-02	6.734-02	8.635-02	1.059-01
2	28	5.762+00	0.000+00	0.000+00	1.180-03	6.531-04	3.270-04	1.596-04	7.635-05	3.625-05
2	29	6.261+00	0.000+00	0.000+00	1.568-01	1.677-01	1.739-01	1.770-01	1.783-01	1.787-01
2	30	6.264+00	0.000+00	0.000+00	4.425-03	2.135-03	1.090-03	5.613-04	2.848-04	1.467-04
2	31	6.272+00	0.000+00	0.000+00	6.584-05	3.452-05	1.756-05	8.824-06	4.420-06	2.213-06
2	32	6.274+00	0.000+00	0.000+00	2.440-04	2.796-04	3.077-04	3.292-04	3.467-04	3.608-04
2	33	6.276+00	0.000+00	9.995+05	1.664-02	2.009-02	2.445-02	2.810-02	3.097-02	3.308-02
2	34	6.276+00	0.000+00	0.000+00	4.932-05	2.676-05	1.412-05	7.348-06	3.792-06	1.923-06
2	35	6.286+00	0.000+00	0.000+00	5.691-03	2.747-03	1.410-03	7.374-04	3.805-04	1.985-04

Table II. Ca IX Oscillator Strengths, Radiative Decay Rates, and Collision Strengths for transitions involving the lowest 4 levels.

Low. Lev.	Upp. Lev.		Osc. Str.	Rad. Dec. Rate	Collision Strength Impact Electron Energy - Eo (Ry)				
i	j	Eo	gf	(1/s)	E	5.8	13.6	24.2	38.6	57.9
2	36	6.457+00	0.000+00	0.000+00	2.622-04	1.401-04	7.294-05	3.748-05	1.911-05	9.565-06
2	37	6.459+00	0.000+00	0.000+00	1.655-04	8.174-05	4.012-05	1.982-05	9.870-06	4.908-06
2	38	6.485+00	1.971-04	2.220+07	5.107-05	7.428-05	1.026-04	1.359-04	1.701-04	2.070-04
2	39	6.485+00	0.000+00	0.000+00	3.456-06	1.891-06	1.031-06	5.724-07	3.251-07	1.945-07
2	40	6.486+00	0.000+00	0.000+00	7.604-06	3.906-06	1.971-06	1.003-06	5.171-07	2.796-07
2	41	6.983+00	0.000+00	0.000+00	1.205-05	6.741-06	3.519-06	1.753-06	8.264-07	4.125-07
2	42	7.055+00	1.987-01	2.648+10	1.377-02	3.083-02	5.364-02	8.052-02	1.096-01	1.406-01
2	43	7.056+00	0.000+00	0.000+00	5.249-03	2.848-03	1.474-03	7.424-04	3.673-04	1.794-04
2	44	7.058+00	0.000+00	0.000+00	9.976-03	9.919-03	1.048-02	1.088-02	1.119-02	1.148-02
2	45	7.073+00	0.000+00	0.000+00	4.899-03	2.609-03	1.348-03	6.817-04	3.383-04	1.657-04
2	46	7.282+00	0.000+00	0.000+00	8.746-02	9.545-02	1.006-01	1.038-01	1.056-01	1.065-01
2	47	7.293+00	0.000+00	0.000+00	2.573-03	1.304-03	7.041-04	3.885-04	2.077-04	1.065-04
2	48	7.326+00	0.000+00	0.000+00	4.211-05	4.176-05	4.788-05	5.409-05	5.994-05	6.465-05
2	49	7.400+00	0.000+00	8.880+06	7.927-02	1.129-01	1.418-01	1.661-01	1.840-01	1.980-01
2	50	7.401+00	0.000+00	0.000+00	1.121-02	5.119-03	2.387-03	1.143-03	5.435-04	2.498-04
2	51	7.401+00	0.000+00	0.000+00	1.108-02	1.068-02	1.137-02	1.246-02	1.377-02	1.475-02
2	52	7.415+00	0.000+00	0.000+00	5.183-04	2.595-04	1.384-04	7.548-05	3.994-05	2.018-05
2	53	7.497+00	0.000+00	0.000+00	9.199-03	4.171-03	1.934-03	9.237-04	4.363-04	1.991-04
2	54	7.797+00	2.806-03	4.568+08	1.532-03	1.133-03	1.027-03	1.160-03	1.419-03	1.754-03
2	55	7.851+00	5.194-02	8.571+09	4.913-03	7.560-03	1.197-02	1.769-02	2.412-02	3.108-02
2	56	7.862+00	0.000+00	0.000+00	1.794-03	9.988-04	5.086-04	2.540-04	1.274-04	6.612-05
2	57	7.893+00	0.000+00	0.000+00	2.128-04	2.249-04	2.439-04	2.572-04	2.670-04	2.737-04
2	58	7.930+00	0.000+00	0.000+00	5.449-04	3.105-04	1.608-04	8.076-05	4.019-05	2.048-05
2	59	7.936+00	4.431-02	7.473+09	4.513-03	6.355-03	9.770-03	1.436-02	1.965-02	2.544-02
2	60	7.959+00	0.000+00	0.000+00	7.231-05	5.359-05	4.151-05	3.434-05	3.182-05	3.054-05
2	61	7.961+00	0.000+00	0.000+00	5.741-04	3.255-04	1.682-04	8.453-05	4.220-05	2.160-05
2	62	8.065+00	0.000+00	0.000+00	6.771-04	3.736-04	1.903-04	9.533-05	4.808-05	2.503-05
2	63	8.205+00	0.000+00	0.000+00	2.688-04	1.583-04	8.288-05	4.174-05	2.068-05	1.040-05
2	64	8.429+00	1.590-02	3.024+09	2.284-03	3.400-03	4.893-03	6.729-03	8.754-03	1.081-02
2	65	8.527+00	0.000+00	0.000+00	3.205-04	1.720-04	8.436-05	4.123-05	2.033-05	9.454-06
2	66	8.643+00	0.000+00	0.000+00	1.854-03	9.397-04	5.004-04	2.637-04	1.353-04	6.727-05
2	67	8.643+00	0.000+00	1.915+06	5.683-03	6.827-03	8.381-03	9.894-03	1.124-02	1.245-02
2	68	8.652+00	0.000+00	2.175+06	4.678-03	6.636-03	8.724-03	1.056-02	1.217-02	1.358-02
2	69	8.654+00	0.000+00	0.000+00	2.826-03	1.464-03	7.896-04	4.219-04	2.209-04	1.122-04
2	70	8.686+00	0.000+00	0.000+00	1.501-03	7.332-04	3.789-04	1.973-04	9.997-05	4.995-05
2	71	8.687+00	0.000+00	0.000+00	2.386-02	2.603-02	2.750-02	2.845-02	2.900-02	2.933-02
2	72	8.690+00	0.000+00	1.049+06	4.187-03	4.727-03	5.537-03	6.475-03	7.300-03	7.943-03
2	73	8.695+00	0.000+00	0.000+00	1.657-03	7.933-04	4.050-04	2.129-04	1.099-04	5.613-05
2	74	8.703+00	0.000+00	9.162+05	2.394-03	3.085-03	3.918-03	4.643-03	5.329-03	5.907-03
2	75	8.707+00	0.000+00	0.000+00	2.142-03	1.152-03	6.315-04	3.413-04	1.806-04	9.336-05
2	76	8.731+00	0.000+00	0.000+00	1.056-04	8.016-05	7.553-05	7.910-05	8.712-05	9.550-05
2	77	8.735+00	0.000+00	0.000+00	1.685-04	8.992-05	4.768-05	2.515-05	1.314-05	6.714-06
2	78	8.818+00	0.000+00	5.126+04	5.844-04	3.645-04	3.032-04	2.876-04	3.219-04	3.360-04
2	79	8.824+00	0.000+00	0.000+00	4.556-04	2.164-04	1.112-04	6.018-05	3.296-05	1.768-05
2	80	8.829+00	0.000+00	0.000+00	6.672-03	7.285-03	7.708-03	7.985-03	8.146-03	8.241-03

Table II. Ca IX Oscillator Strengths, Radiative Decay Rates, and Collision Strengths for transitions involving the lowest 4 levels.

Low. Lev.	Upp. Lev.		Osc. Str.	Rad. Dec. Rate	Collision Strength Impact Electron Energy - Eo (Ry)				
i	j	Eo	gf	(1/s)	E	5.8	13.6	24.2	38.6	57.9
2	81	8.878+00	0.000+00	0.000+00	4.962-04	2.352-04	1.202-04	6.503-05	3.575-05	1.917-05
2	82	8.936+00	0.000+00	0.000+00	2.334-02	2.667-02	2.971-02	3.196-02	3.345-02	3.434-02
2	83	8.956+00	0.000+00	0.000+00	8.342-03	4.211-03	2.080-03	1.015-03	4.830-04	2.201-04
2	84	8.962+00	0.000+00	0.000+00	1.627-02	2.131-02	2.509-02	2.764-02	2.926-02	3.021-02
2	85	8.977+00	0.000+00	0.000+00	3.474-04	2.532-04	2.526-04	2.774-04	2.952-04	3.055-04
2	86	8.991+00	0.000+00	0.000+00	3.330-03	1.716-03	8.585-04	4.225-04	2.029-04	9.321-05
2	87	9.001+00	0.000+00	0.000+00	7.244-03	8.866-03	1.015-02	1.110-02	1.173-02	1.212-02
2	88	9.007+00	0.000+00	0.000+00	8.260-04	4.333-04	2.198-04	1.097-04	5.369-05	2.539-05
2	89	9.052+00	0.000+00	0.000+00	7.323-03	7.996-03	8.792-03	9.482-03	9.982-03	1.025-02
2	90	9.057+00	0.000+00	0.000+00	1.743-03	8.849-04	4.378-04	2.124-04	1.008-04	4.560-05
2	91	9.061+00	5.225-02	1.149+10	3.011-03	6.056-03	1.003-02	1.486-02	2.017-02	2.581-02
2	92	9.083+00	0.000+00	0.000+00	2.257-03	1.170-03	5.910-04	2.936-04	1.434-04	6.765-05
2	93	9.104+00	0.000+00	0.000+00	3.223-03	1.522-03	7.158-04	3.361-04	1.547-04	6.785-05
2	94	9.143+00	0.000+00	0.000+00	1.977-03	1.516-03	1.340-03	1.291-03	1.283-03	1.323-03
2	95	9.148+00	0.000+00	0.000+00	1.237-03	6.962-04	3.756-04	1.979-04	1.031-04	5.327-05
2	96	9.153+00	3.198-02	7.175+09	1.728-03	3.402-03	5.667-03	8.471-03	1.159-02	1.497-02
2	97	9.229+00	0.000+00	0.000+00	8.416-04	4.570-04	2.384-04	1.220-04	6.115-05	3.031-05
2	98	9.258+00	0.000+00	4.193+06	2.131-02	2.809-02	3.414-02	3.946-02	4.394-02	4.732-02
2	99	9.258+00	0.000+00	0.000+00	4.513-03	2.211-03	1.079-03	5.362-04	2.685-04	1.309-04
2	100	9.259+00	0.000+00	0.000+00	3.391-03	2.678-03	2.674-03	2.892-03	3.189-03	3.531-03
2	101	9.296+00	0.000+00	0.000+00	4.366-03	2.137-03	1.042-03	5.177-04	2.585-04	1.256-04
2	102	9.333+00	0.000+00	0.000+00	1.257-03	1.584-03	1.993-03	2.278-03	2.475-03	2.562-03
2	103	9.334+00	0.000+00	0.000+00	1.080-03	3.945-04	1.514-04	6.094-05	2.557-05	1.112-05
2	104	9.336+00	0.000+00	0.000+00	1.484-03	1.084-03	1.097-03	1.213-03	1.283-03	1.323-03
2	105	9.407+00	0.000+00	0.000+00	7.610-04	3.177-04	1.386-04	6.274-05	2.943-05	1.420-05
2	106	9.534+00	4.223-04	1.028+08	3.269-05	3.461-05	4.777-05	7.141-05	1.020-04	1.392-04
2	107	9.535+00	0.000+00	0.000+00	2.450-05	1.294-05	6.586-06	3.261-06	1.596-06	7.664-07
2	108	9.537+00	0.000+00	0.000+00	8.779-05	9.832-05	1.113-04	1.217-04	1.286-04	1.326-04
2	109	9.611+00	0.000+00	0.000+00	1.493-04	8.308-05	4.458-05	2.344-05	1.211-05	6.068-06
2	110	1.002+01	0.000+00	0.000+00	1.729-02	1.925-02	2.066-02	2.162-02	2.223-02	2.262-02
2	111	1.003+01	0.000+00	0.000+00	1.194-03	5.998-04	3.227-04	1.790-04	9.701-05	4.993-05
2	112	1.006+01	0.000+00	0.000+00	5.343-06	4.349-06	4.184-06	4.397-06	4.670-06	4.877-06
2	113	1.006+01	0.000+00	0.000+00	4.092-06	3.697-06	3.824-06	4.111-06	4.355-06	4.571-06
2	114	1.007+01	0.000+00	0.000+00	2.440-05	1.211-05	6.418-06	3.510-06	1.891-06	9.642-07
2	115	1.009+01	0.000+00	0.000+00	9.537-06	4.664-06	2.428-06	1.316-06	7.022-07	3.548-07
2	116	1.009+01	0.000+00	0.000+00	9.719-06	9.389-06	9.717-06	1.017-05	1.092-05	1.116-05
2	117	1.010+01	0.000+00	0.000+00	1.137-06	5.740-07	2.932-07	1.523-07	7.630-08	4.019-08
2	118	1.011+01	0.000+00	1.842+04	4.172-05	5.485-05	6.754-05	8.047-05	9.128-05	9.848-05
2	119	1.012+01	0.000+00	0.000+00	1.101-05	5.316-06	2.612-06	1.326-06	6.661-07	3.234-07
2	120	1.012+01	0.000+00	0.000+00	6.809-06	6.017-06	6.186-06	6.693-06	7.451-06	8.150-06
2	121	1.021+01	0.000+00	0.000+00	1.777-03	1.986-03	2.136-03	2.242-03	2.311-03	2.356-03
2	122	1.021+01	0.000+00	0.000+00	1.065-04	5.355-05	2.891-05	1.614-05	8.818-06	4.460-06
2	123	1.021+01	0.000+00	0.000+00	6.438-06	6.566-06	7.080-06	7.624-06	8.133-06	8.605-06
2	124	1.024+01	0.000+00	0.000+00	9.420-06	4.447-06	2.250-06	1.185-06	6.103-07	3.178-07
2	125	1.030+01	4.854-03	1.378+09	9.149-04	7.843-04	8.561-04	1.112-03	1.477-03	1.892-03

Table II. Ca IX Oscillator Strengths, Radiative Decay Rates, and Collision Strengths for transitions involving the lowest 4 levels.

Low. Lev.	Upp. Lev.		Osc. Str.	Rad. Dec. Rate	Collision Strength Impact Electron Energy - Eo (Ry)					
i	j	Eo	gf	(1/s)	E	5.8	13.6	24.2	38.6	57.9
2	126	1.032+01	3.673-02	1.047+10	1.796-03	2.901-03	4.752-03	7.337-03	1.041-02	1.367-02
2	127	1.032+01	0.000+00	0.000+00	7.926-05	3.840-05	1.990-05	1.056-05	5.476-06	2.659-06
2	128	1.033+01	0.000+00	0.000+00	1.165-03	6.627-04	3.409-04	1.715-04	8.538-05	4.227-05
2	129	1.034+01	0.000+00	0.000+00	2.695-04	1.549-04	8.024-05	4.047-05	2.010-05	9.817-06
2	130	1.035+01	6.640-03	1.906+09	4.711-04	5.830-04	8.556-04	1.283-03	1.809-03	2.387-03
2	131	1.036+01	0.000+00	0.000+00	1.560-05	1.263-05	1.171-05	1.143-05	1.154-05	1.188-05
2	132	1.037+01	0.000+00	0.000+00	1.017-04	5.817-05	3.010-05	1.521-05	7.595-06	3.708-06
2	133	1.038+01	3.977-04	1.148+08	4.731-05	4.426-05	5.241-05	7.127-05	9.709-05	1.265-04
2	134	1.043+01	0.000+00	0.000+00	2.581-04	1.444-04	7.389-05	3.719-05	1.867-05	9.419-06
2	135	1.048+01	0.000+00	0.000+00	5.322-05	3.064-05	1.599-05	8.034-06	3.945-06	1.949-06
2	136	1.069+01	0.000+00	1.648+05	1.515-03	8.706-04	5.998-04	4.916-04	4.492-04	4.454-04
2	137	1.070+01	0.000+00	5.551+06	4.220-03	6.514-03	8.692-03	1.081-02	1.260-02	1.414-02
2	138	1.071+01	0.000+00	0.000+00	7.271-04	3.555-04	1.860-04	9.777-05	5.078-05	2.548-05
2	139	1.071+01	0.000+00	0.000+00	2.035-03	1.008-03	5.319-04	2.806-04	1.458-04	7.327-05
2	140	1.073+01	0.000+00	1.097+05	2.084-04	1.749-04	1.782-04	1.973-04	2.193-04	2.414-04
2	141	1.074+01	0.000+00	0.000+00	1.711-04	8.679-05	4.605-05	2.432-05	1.264-05	6.411-06
2	142	1.075+01	0.000+00	0.000+00	1.689-05	8.939-06	5.595-06	4.652-06	4.537-06	4.930-06
2	143	1.077+01	0.000+00	4.955+05	5.392-04	6.187-04	7.449-04	8.919-04	1.023-03	1.144-03
2	144	1.077+01	0.000+00	0.000+00	4.037-05	2.277-05	1.267-05	6.974-06	3.937-06	2.381-06
2	145	1.077+01	0.000+00	0.000+00	1.017-04	4.964-05	2.572-05	1.346-05	7.045-06	3.584-06
2	146	1.078+01	0.000+00	0.000+00	2.061-05	2.304-05	2.538-05	2.760-05	2.957-05	3.121-05
2	147	1.080+01	0.000+00	0.000+00	3.998-04	2.020-04	1.075-04	5.704-05	2.982-05	1.511-05
2	148	1.081+01	0.000+00	0.000+00	1.091-05	8.357-06	7.650-06	8.089-06	8.983-06	9.818-06
2	149	1.081+01	0.000+00	0.000+00	7.087-06	3.494-06	1.711-06	8.981-07	5.167-07	3.090-07
2	150	1.081+01	0.000+00	0.000+00	5.767-06	4.902-06	4.701-06	4.810-06	4.979-06	5.154-06
2	151	1.082+01	0.000+00	0.000+00	2.349-03	2.708-03	3.005-03	3.256-03	3.461-03	3.630-03
2	152	1.083+01	0.000+00	0.000+00	6.047-04	3.375-04	1.797-04	9.313-05	4.743-05	2.362-05
2	153	1.083+01	0.000+00	0.000+00	8.542-07	3.374-07	1.747-07	1.368-07	1.415-07	1.485-07
2	154	1.083+01	0.000+00	0.000+00	2.132-06	1.073-06	5.514-07	3.303-07	2.400-07	1.916-07
2	155	1.084+01	0.000+00	0.000+00	2.058-03	1.208-03	7.350-04	4.753-04	3.434-04	2.802-04
2	156	1.084+01	0.000+00	0.000+00	2.040-04	1.007-04	5.278-05	2.802-05	1.492-05	7.667-06
2	157	1.085+01	0.000+00	0.000+00	1.777-03	2.055-03	2.227-03	2.359-03	2.608-03	2.777-03
2	158	1.085+01	0.000+00	0.000+00	7.500-03	9.896-03	1.164-02	1.296-02	1.395-02	1.471-02
2	159	1.085+01	0.000+00	0.000+00	1.549-03	8.569-04	4.513-04	2.313-04	1.167-04	5.733-05
2	160	1.085+01	0.000+00	0.000+00	1.680-03	6.668-04	2.870-04	1.327-04	5.850-05	2.497-05
2	161	1.085+01	0.000+00	0.000+00	2.830-03	1.560-03	8.200-04	4.194-04	2.110-04	1.032-04
2	162	1.087+01	0.000+00	0.000+00	1.277-03	1.432-03	1.534-03	1.617-03	1.785-03	1.899-03
2	163	1.087+01	0.000+00	0.000+00	7.748-04	3.030-04	1.288-04	5.936-05	2.608-05	1.112-05
2	164	1.088+01	0.000+00	0.000+00	3.187-04	2.911-04	2.858-04	2.905-04	2.991-04	3.083-04
2	165	1.089+01	0.000+00	0.000+00	2.080-04	1.118-04	5.783-05	2.922-05	1.449-05	6.955-06
2	166	1.089+01	0.000+00	0.000+00	2.696-06	1.433-06	1.163-06	1.144-06	1.244-06	1.402-06
2	167	1.089+01	0.000+00	0.000+00	1.021-05	1.185-05	1.258-05	1.322-05	1.458-05	1.553-05
2	168	1.089+01	0.000+00	0.000+00	1.089-05	3.932-06	1.575-06	7.298-07	3.307-07	1.472-07
2	169	1.089+01	0.000+00	0.000+00	1.241-05	6.767-06	4.931-06	4.685-06	5.108-06	5.604-06
2	170	1.090+01	0.000+00	0.000+00	3.088-05	1.228-05	5.308-06	2.427-06	1.058-06	4.498-07

Table II. Ca IX Oscillator Strengths, Radiative Decay Rates, and Collision Strengths for transitions involving the lowest 4 levels.

Low. Lev.	Upp. Lev.		Osc. Str.	Rad. Dec. Rate	Collision Strength Impact Electron Energy - Eo (Ry)				
i	j	Eo	gf	(1/s)	E	5.8	13.6	24.2	38.6	57.9
2	171	1.091+01	4.273-05	1.362+07	9.242-06	7.050-06	7.179-06	9.039-06	1.187-05	1.510-05
2	172	1.091+01	0.000+00	0.000+00	1.458-03	1.595-03	1.733-03	1.860-03	1.968-03	2.060-03
2	173	1.092+01	0.000+00	0.000+00	3.868-04	2.112-04	1.103-04	5.610-05	2.798-05	1.357-05
2	174	1.093+01	4.200-04	1.343+08	3.169-05	5.189-05	7.609-05	1.036-04	1.346-04	1.681-04
2	175	1.093+01	0.000+00	0.000+00	3.660-04	3.799-04	3.965-04	4.132-04	4.544-04	4.810-04
2	176	1.093+01	0.000+00	0.000+00	2.276-04	8.717-05	3.641-05	1.644-05	7.033-06	2.939-06
2	177	1.095+01	0.000+00	0.000+00	1.431-06	2.438-06	4.043-06	5.314-06	6.698-06	7.477-06
2	178	1.095+01	0.000+00	0.000+00	1.201-05	5.303-06	2.460-06	1.189-06	5.685-07	2.640-07
2	179	1.095+01	0.000+00	0.000+00	7.985-04	4.394-04	2.310-04	1.182-04	5.939-05	2.900-05
2	180	1.096+01	0.000+00	0.000+00	7.313-05	3.967-05	2.048-05	1.027-05	5.064-06	2.413-06
2	181	1.096+01	0.000+00	0.000+00	5.055-05	6.469-05	7.546-05	8.360-05	8.961-05	9.416-05
2	182	1.096+01	0.000+00	0.000+00	2.223-06	1.081-06	5.187-07	2.514-07	1.247-07	6.037-08
2	183	1.097+01	0.000+00	0.000+00	3.312-04	1.812-04	9.478-05	4.829-05	2.411-05	1.171-05
2	184	1.107+01	2.127-05	6.984+06	2.707-05	2.424-05	2.333-05	2.383-05	2.500-05	2.637-05
2	185	1.107+01	0.000+00	0.000+00	3.359-06	1.729-06	8.492-07	4.366-07	2.403-07	1.371-07
2	186	1.107+01	0.000+00	0.000+00	8.871-06	4.515-06	2.212-06	1.130-06	6.168-07	3.460-07
2	187	1.108+01	0.000+00	0.000+00	4.011-05	2.034-05	1.004-05	4.977-06	2.516-06	1.245-06
2	188	1.110+01	0.000+00	0.000+00	1.009-04	5.378-05	2.743-05	1.362-05	6.634-06	3.083-06
2	189	1.111+01	0.000+00	0.000+00	1.908-05	7.339-06	3.585-06	2.121-06	1.720-06	1.568-06
2	190	1.116+01	0.000+00	0.000+00	1.139-04	1.237-04	1.306-04	1.362-04	1.500-04	1.581-04
2	191	1.116+01	0.000+00	0.000+00	3.766-05	4.254-05	4.864-05	5.431-05	6.031-05	6.266-05
2	192	1.116+01	0.000+00	0.000+00	3.331-05	4.902-05	5.460-05	5.791-05	6.409-05	6.700-05
2	193	1.116+01	0.000+00	0.000+00	2.118-05	1.081-05	5.704-06	3.087-06	1.628-06	8.496-07
2	194	1.117+01	0.000+00	0.000+00	6.500-05	2.324-05	9.233-06	4.064-06	1.684-06	6.997-07
2	195	1.117+01	0.000+00	0.000+00	1.265-06	8.751-07	8.460-07	8.699-07	9.517-07	1.074-06
2	196	1.120+01	0.000+00	0.000+00	3.816-06	2.164-06	1.339-06	8.247-07	5.781-07	4.194-07
2	197	1.128+01	0.000+00	0.000+00	8.518-06	3.042-06	1.166-06	5.106-07	2.317-07	1.206-07
2	198	1.128+01	0.000+00	0.000+00	5.949-06	1.972-06	7.296-07	3.186-07	1.302-07	5.518-08
2	199	1.128+01	0.000+00	0.000+00	8.512-06	1.066-05	1.127-05	1.189-05	1.317-05	1.373-05
2	200	1.129+01	0.000+00	0.000+00	1.904-06	1.055-06	5.773-07	3.174-07	1.697-07	9.278-08
2	201	1.129+01	0.000+00	0.000+00	2.282-06	1.157-06	5.828-07	3.031-07	1.607-07	9.255-08
2	202	1.130+01	0.000+00	0.000+00	3.219-06	3.998-06	4.581-06	6.005-06	6.355-06	7.058-06
2	203	1.132+01	0.000+00	0.000+00	8.718-06	7.066-06	6.716-06	6.935-06	7.456-06	7.462-06
2	204	1.132+01	0.000+00	0.000+00	1.667-06	9.217-07	5.152-07	2.930-07	1.655-07	9.184-08
2	205	1.132+01	0.000+00	0.000+00	3.223-06	3.995-06	4.534-06	4.905-06	5.016-06	5.188-06
2	206	1.135+01	0.000+00	0.000+00	1.875-05	9.285-06	4.636-06	2.418-06	1.234-06	6.264-07
2	207	1.136+01	0.000+00	0.000+00	7.060-06	3.709-06	1.838-06	9.106-07	4.674-07	2.489-07
2	208	1.146+01	0.000+00	0.000+00	2.073-06	1.162-06	6.522-07	3.813-07	2.296-07	1.503-07
2	209	1.149+01	0.000+00	0.000+00	2.106-05	7.284-06	2.796-06	1.203-06	4.843-07	1.994-07
2	210	1.226+01	0.000+00	0.000+00	4.762-06	4.289-06	4.023-06	3.819-06	3.772-06	3.942-06
2	211	1.226+01	0.000+00	0.000+00	1.854-06	9.534-07	4.667-07	2.260-07	1.130-07	5.573-08
2	212	1.227+01	0.000+00	0.000+00	1.527-06	1.761-06	2.168-06	2.634-06	3.037-06	3.342-06
2	213	1.229+01	0.000+00	0.000+00	4.181-06	2.190-06	1.148-06	6.131-07	3.353-07	1.801-07
2	214	1.252+01	0.000+00	0.000+00	1.746-06	9.124-07	5.181-07	3.353-07	2.483-07	2.093-07
2	215	1.253+01	0.000+00	0.000+00	2.199-06	1.087-06	5.665-07	3.080-07	1.742-07	9.296-08

Table II. Ca IX Oscillator Strengths, Radiative Decay Rates, and Collision Strengths for transitions involving the lowest 4 levels.

Low. Lev.	Upp. Lev.		Osc. Str.	Rad. Dec. Rate	Collision Strength Impact Electron Energy - Eo (Ry)				
i	j	Eo	gf	(1/s)	E	5.8	13.6	24.2	38.6	57.9
2	216	1.253+01	0.000+00	0.000+00	2.630-06	2.644-06	3.228-06	3.918-06	4.518-06	5.157-06
2	217	1.253+01	0.000+00	0.000+00	1.267-06	6.739-07	3.723-07	2.067-07	1.153-07	6.158-08
2	218	1.254+01	0.000+00	0.000+00	3.976-06	4.549-06	5.513-06	6.769-06	7.943-06	8.602-06
2	219	1.255+01	0.000+00	0.000+00	2.470-06	1.268-06	6.683-07	3.590-07	1.961-07	1.077-07
2	220	1.255+01	0.000+00	0.000+00	2.069-07	1.427-07	1.440-07	1.842-07	2.329-07	2.823-07
2	221	1.258+01	0.000+00	0.000+00	1.082-06	9.631-07	9.941-07	1.028-06	1.059-06	1.084-06
2	222	1.258+01	0.000+00	0.000+00	1.249-06	6.113-07	3.023-07	1.519-07	7.762-08	3.801-08
2	223	1.258+01	0.000+00	0.000+00	2.119-06	2.212-06	2.312-06	2.381-06	2.406-06	2.397-06
2	224	1.260+01	0.000+00	0.000+00	9.172-06	5.083-06	2.875-06	1.624-06	9.221-07	5.051-07
2	225	1.263+01	0.000+00	0.000+00	3.191-06	1.688-06	9.202-07	5.140-07	2.976-07	1.655-07
2	226	1.287+01	0.000+00	0.000+00	1.635-06	9.117-07	4.900-07	2.609-07	1.408-07	7.608-08
2	227	1.288+01	0.000+00	0.000+00	1.583-06	1.850-06	2.740-06	4.061-06	5.521-06	7.103-06
2	228	1.288+01	0.000+00	0.000+00	1.443-06	7.772-07	4.195-07	2.311-07	1.323-07	7.751-08
2	229	1.288+01	0.000+00	0.000+00	1.252-06	1.006-06	9.268-07	9.751-07	1.081-06	1.209-06
2	230	1.289+01	0.000+00	0.000+00	6.270-06	5.416-06	5.213-06	5.334-06	5.607-06	5.982-06
2	231	1.289+01	0.000+00	0.000+00	4.912-06	2.847-06	1.615-06	9.038-07	4.983-07	2.699-07
2	232	1.289+01	0.000+00	0.000+00	8.822-08	1.005-07	1.325-07	1.674-07	2.155-07	2.303-07
2	233	1.289+01	0.000+00	0.000+00	5.361-07	3.117-07	2.108-07	1.753-07	1.768-07	1.902-07
2	234	1.293+01	0.000+00	0.000+00	9.587-07	9.961-07	1.368-06	1.864-06	2.275-06	2.566-06
2	235	1.293+01	0.000+00	0.000+00	2.026-06	1.112-06	5.902-07	3.088-07	1.623-07	8.650-08
2	236	1.294+01	0.000+00	0.000+00	1.600-06	1.174-06	1.035-06	1.048-06	1.134-06	1.259-06
2	237	1.294+01	0.000+00	0.000+00	1.002-06	5.772-07	3.262-07	1.825-07	1.009-07	5.482-08
2	238	1.299+01	0.000+00	0.000+00	3.763-06	2.011-06	1.091-06	6.113-07	3.548-07	2.067-07
2	239	1.299+01	0.000+00	0.000+00	4.610-07	2.336-07	1.219-07	6.797-08	4.115-08	2.600-08
2	240	1.299+01	9.515-05	4.302+07	4.512-06	5.645-06	7.302-06	9.435-06	1.213-05	1.552-05
2	241	1.299+01	0.000+00	0.000+00	5.030-07	2.636-07	1.367-07	7.159-08	3.848-08	2.159-08
2	242	1.300+01	0.000+00	0.000+00	4.738-06	2.750-06	1.560-06	8.734-07	4.814-07	2.608-07
2	243	1.302+01	0.000+00	0.000+00	2.854-06	1.458-06	7.452-07	4.113-07	2.396-07	1.596-07
2	244	1.303+01	0.000+00	0.000+00	6.698-06	7.212-06	8.375-06	9.466-06	1.058-05	1.185-05
2	245	1.303+01	0.000+00	0.000+00	5.538-06	2.926-06	1.501-06	7.807-07	4.044-07	1.952-07
2	246	1.303+01	0.000+00	0.000+00	3.200-08	3.768-08	5.339-08	6.527-08	7.704-08	7.435-08
2	247	1.304+01	0.000+00	0.000+00	1.016-05	1.399-05	1.798-05	2.153-05	2.474-05	2.700-05
2	248	1.304+01	0.000+00	0.000+00	3.408-06	1.723-06	8.456-07	4.241-07	2.116-07	1.037-07
2	249	1.304+01	0.000+00	0.000+00	1.702-06	1.500-06	1.524-06	1.632-06	1.805-06	2.024-06
2	250	1.306+01	0.000+00	0.000+00	1.683-06	8.767-07	4.957-07	2.950-07	2.129-07	1.744-07
2	251	1.308+01	0.000+00	0.000+00	1.042-06	4.891-07	2.256-07	1.124-07	6.553-08	4.364-08
2	252	1.308+01	0.000+00	0.000+00	3.303-06	1.643-06	8.020-07	3.964-07	2.040-07	1.086-07
2	253	1.308+01	0.000+00	0.000+00	1.152-06	5.137-07	2.237-07	9.535-08	4.411-08	2.149-08
2	254	1.308+01	0.000+00	0.000+00	2.495-06	2.534-06	3.048-06	3.577-06	4.071-06	4.596-06
2	255	1.309+01	0.000+00	0.000+00	1.013-06	1.096-06	1.327-06	1.665-06	1.888-06	2.000-06
2	256	1.309+01	0.000+00	0.000+00	1.721-06	9.403-07	4.994-07	2.655-07	1.396-07	6.918-08
2	257	1.309+01	0.000+00	0.000+00	7.572-07	3.709-07	1.744-07	7.652-08	3.404-08	1.496-08
2	258	1.309+01	0.000+00	0.000+00	4.936-07	2.688-07	2.309-07	2.713-07	3.527-07	3.972-07
2	259	1.309+01	0.000+00	0.000+00	4.154-07	1.801-07	7.995-08	3.860-08	1.901-08	1.034-08
2	260	1.309+01	0.000+00	0.000+00	1.640-07	7.801-08	4.795-08	3.691-08	4.327-08	4.181-08

Table II. Ca IX Oscillator Strengths, Radiative Decay Rates, and Collision Strengths for transitions involving the lowest 4 levels.

Low. Lev.	Upp. Lev.		Osc. Str.	Rad. Dec. Rate	Collision Strength Impact Electron Energy - Eo (Ry)				
i	j	Eo	gf	(1/s)	E	5.8	13.6	24.2	38.6	57.9
2	261	1.310+01	0.000+00	0.000+00	2.869-07	1.149-07	4.992-08	2.263-08	1.299-08	1.019-08
2	262	1.310+01	0.000+00	0.000+00	1.115-06	5.429-07	2.562-07	1.245-07	5.718-08	2.510-08
2	263	1.310+01	0.000+00	2.405+04	5.413-06	8.023-06	1.064-05	1.326-05	1.580-05	1.791-05
2	264	1.310+01	0.000+00	0.000+00	1.576-06	7.304-07	3.279-07	1.514-07	6.913-08	3.298-08
2	265	1.310+01	0.000+00	0.000+00	1.398-06	7.714-07	4.193-07	2.248-07	1.193-07	6.399-08
2	266	1.310+01	0.000+00	0.000+00	2.289-06	2.045-06	2.156-06	2.539-06	2.825-06	2.973-06
2	267	1.310+01	0.000+00	0.000+00	2.778-07	1.264-07	5.784-08	2.840-08	1.363-08	7.356-09
2	268	1.310+01	0.000+00	0.000+00	3.086-07	5.075-07	7.083-07	8.789-07	1.033-06	1.070-06
2	269	1.310+01	0.000+00	0.000+00	2.364-07	1.062-07	4.686-08	2.079-08	9.007-09	4.111-09
2	270	1.310+01	0.000+00	0.000+00	1.853-06	8.987-07	4.295-07	1.899-07	8.521-08	3.747-08
2	271	1.311+01	0.000+00	0.000+00	4.505-08	4.045-08	4.844-08	5.811-08	6.191-08	6.793-08
2	272	1.311+01	0.000+00	0.000+00	4.556-06	5.738-06	7.093-06	8.272-06	9.347-06	9.995-06
2	273	1.311+01	0.000+00	0.000+00	4.481-07	2.310-07	1.163-07	6.092-08	3.103-08	1.545-08
2	274	1.311+01	0.000+00	0.000+00	9.734-07	1.276-06	1.845-06	2.871-06	4.394-06	6.284-06
2	275	1.312+01	0.000+00	0.000+00	5.685-06	2.838-06	1.390-06	6.965-07	3.389-07	1.554-07
2	276	1.313+01	0.000+00	0.000+00	1.319-06	6.388-07	3.056-07	1.351-07	6.054-08	2.661-08
2	277	1.313+01	0.000+00	0.000+00	8.284-07	6.157-07	5.680-07	6.091-07	7.054-07	7.493-07
2	278	1.313+01	0.000+00	0.000+00	3.196-07	1.695-07	9.110-08	4.931-08	2.588-08	1.427-08
2	279	1.314+01	0.000+00	0.000+00	1.815-07	1.354-07	1.807-07	3.320-07	5.187-07	6.404-07
2	280	1.315+01	0.000+00	0.000+00	6.315-07	3.637-07	2.038-07	1.119-07	6.004-08	3.329-08
2	281	1.315+01	0.000+00	0.000+00	9.251-07	4.550-07	2.234-07	1.154-07	6.460-08	3.717-08
2	282	1.318+01	0.000+00	0.000+00	5.260-06	2.934-06	1.583-06	8.517-07	4.549-07	2.292-07
2	283	1.319+01	0.000+00	0.000+00	1.150-06	6.321-07	3.468-07	1.998-07	1.114-07	6.426-08
3	4	2.909-02	0.000+00	4.380-01	7.413-01	6.189-01	5.769-01	5.595-01	5.520-01	5.497-01
3	5	6.754-01	0.000+00	0.000+00	4.307-02	2.209-02	1.177-02	6.550-03	3.818-03	2.425-03
3	6	1.748+00	2.257-02	1.108+08	2.086-01	2.027-01	2.071-01	2.193-01	2.356-01	2.533-01
3	7	1.794+00	3.639-01	9.404+09	2.005+00	2.443+00	2.840+00	3.210+00	3.561+00	3.890+00
3	8	1.812+00	2.767-01	2.431+09	1.521+00	1.841+00	2.133+00	2.408+00	2.671+00	2.917+00
3	9	1.843+00	4.461-01	2.434+09	2.365+00	2.878+00	3.346+00	3.783+00	4.199+00	4.589+00
3	10	2.362+00	6.625-04	2.970+07	7.178-03	5.670-03	4.898-03	4.688-03	4.779-03	5.018-03
3	11	2.449+00	3.501-01	5.622+09	1.174+00	1.438+00	1.688+00	1.925+00	2.154+00	2.372+00
3	12	2.450+00	1.053+00	1.015+10	3.482+00	4.311+00	5.083+00	5.809+00	6.504+00	7.167+00
3	13	2.452+00	0.000+00	0.000+00	1.048-01	8.629-02	7.958-02	7.899-02	8.138-02	8.458-02
3	14	3.000+00	2.271-03	3.283+07	3.626-02	2.280-02	1.625-02	1.345-02	1.259-02	1.269-02
3	15	3.818+00	0.000+00	2.095+05	1.864-01	2.056-01	2.201-01	2.316-01	2.402-01	2.462-01
3	16	3.836+00	0.000+00	3.292+05	3.534-01	4.141-01	4.573-01	4.890-01	5.116-01	5.267-01
3	17	3.858+00	0.000+00	0.000+00	1.712-02	1.003-02	5.715-03	3.219-03	1.843-03	1.102-03
3	18	3.895+00	0.000+00	2.113+03	1.550-02	9.977-03	6.566-03	4.579-03	3.487-03	2.904-03
3	19	4.150+00	0.000+00	2.590+05	1.454-01	1.656-01	1.807-01	1.923-01	2.010-01	2.069-01
3	20	4.160+00	0.000+00	4.061+05	1.244-01	1.470-01	1.634-01	1.756-01	1.843-01	1.902-01
3	21	4.176+00	0.000+00	0.000+00	1.435-03	8.391-04	4.726-04	2.584-04	1.391-04	7.436-05
3	22	4.185+00	0.000+00	7.195+04	2.433-02	2.667-02	2.853-02	3.003-02	3.120-02	3.203-02
3	23	4.189+00	0.000+00	0.000+00	8.503-03	5.052-03	2.901-03	1.631-03	9.193-04	5.323-04
3	24	4.190+00	0.000+00	1.428+05	1.032-01	1.184-01	1.298-01	1.384-01	1.448-01	1.491-01
3	25	4.616+00	0.000+00	0.000+00	2.496-02	1.445-02	8.086-03	4.420-03	2.397-03	1.305-03

Table II. Ca IX Oscillator Strengths, Radiative Decay Rates, and Collision Strengths for transitions involving the lowest 4 levels.

Low. Lev.	Upp. Lev.		Osc. Str.	Rad. Dec. Rate	Collision Strength Impact Electron Energy - Eo (Ry)				
i	j	Eo	gf	(1/s)	E	5.8	13.6	24.2	38.6	57.9
3	26	4.708+00	0.000+00	0.000+00	6.240-03	3.662-03	2.076-03	1.140-03	6.180-04	3.374-04
3	27	5.606+00	2.714-01	2.284+10	5.207-02	9.639-02	1.481-01	2.048-01	2.625-01	3.218-01
3	28	5.748+00	1.021-04	2.710+07	3.538-03	1.984-03	1.020-03	5.487-04	3.131-04	2.180-04
3	29	6.248+00	0.000+00	0.000+00	5.204-03	2.499-03	1.277-03	6.639-04	3.404-04	1.770-04
3	30	6.250+00	0.000+00	1.089+06	4.446-01	4.750-01	4.940-01	5.049-01	5.106-01	5.132-01
3	31	6.259+00	0.000+00	0.000+00	4.192-04	4.349-04	4.556-04	4.764-04	4.964-04	5.139-04
3	32	6.260+00	0.000+00	0.000+00	2.155-04	1.331-04	8.923-05	6.724-05	5.685-05	5.226-05
3	33	6.262+00	0.000+00	2.241+06	4.438-02	4.874-02	5.704-02	6.453-02	7.061-02	7.517-02
3	34	6.263+00	0.000+00	0.000+00	4.374-04	4.507-04	4.692-04	4.886-04	5.077-04	5.249-04
3	35	6.272+00	0.000+00	1.594+05	5.990-02	5.599-02	5.488-02	5.453-02	5.443-02	5.441-02
3	36	6.444+00	0.000+00	0.000+00	7.933-04	4.311-04	2.301-04	1.249-04	7.046-05	4.247-05
3	37	6.445+00	0.000+00	0.000+00	5.034-04	2.588-04	1.390-04	8.472-05	6.189-05	5.423-05
3	38	6.471+00	1.379-04	1.547+07	5.403-05	6.236-05	7.790-05	9.905-05	1.218-04	1.471-04
3	39	6.472+00	1.772-04	5.961+07	4.653-05	6.667-05	9.171-05	1.215-04	1.521-04	1.853-04
3	40	6.473+00	2.403-04	1.618+07	8.005-05	9.962-05	1.296-04	1.680-04	2.086-04	2.530-04
3	41	6.969+00	0.000+00	0.000+00	3.539-05	2.001-05	1.065-05	5.626-06	3.076-06	1.938-06
3	42	7.042+00	1.504-01	1.997+10	1.758-02	2.735-02	4.285-02	6.230-02	8.384-02	1.072-01
3	43	7.043+00	4.473-01	3.564+10	4.236-02	8.033-02	1.321-01	1.931-01	2.588-01	3.291-01
3	44	7.045+00	0.000+00	0.000+00	2.740-02	2.394-02	2.315-02	2.292-02	2.301-02	2.332-02
3	45	7.059+00	0.000+00	0.000+00	1.465-02	7.826-03	4.043-03	2.065-03	1.044-03	5.342-04
3	46	7.268+00	0.000+00	0.000+00	2.308-03	1.169-03	6.313-04	3.481-04	1.861-04	9.555-05
3	47	7.280+00	0.000+00	5.485+03	2.608-01	2.831-01	2.977-01	3.067-01	3.118-01	3.144-01
3	48	7.312+00	0.000+00	1.010+04	2.594-03	1.361-03	7.923-04	5.000-04	3.380-04	2.507-04
3	49	7.387+00	0.000+00	8.827+06	9.528-02	1.204-01	1.455-01	1.682-01	1.853-01	1.989-01
3	50	7.387+00	0.000+00	1.262+07	1.729-01	2.391-01	2.975-01	3.474-01	3.847-01	4.138-01
3	51	7.387+00	0.000+00	0.000+00	3.752-02	2.771-02	2.493-02	2.513-02	2.670-02	2.811-02
3	52	7.402+00	0.000+00	0.000+00	6.527-03	5.939-03	5.748-03	5.681-03	5.652-03	5.638-03
3	53	7.484+00	0.000+00	1.285+04	2.778-02	1.278-02	6.158-03	3.168-03	1.747-03	1.067-03
3	54	7.783+00	1.030-02	1.670+09	3.896-03	3.160-03	3.241-03	3.967-03	5.043-03	6.336-03
3	55	7.837+00	2.028-02	3.335+09	4.224-03	4.263-03	5.376-03	7.306-03	9.667-03	1.232-02
3	56	7.849+00	1.158-01	1.146+10	1.309-02	1.824-02	2.763-02	4.016-02	5.438-02	6.987-02
3	57	7.879+00	0.000+00	0.000+00	2.327-03	1.505-03	1.023-03	7.798-04	6.654-04	6.141-04
3	58	7.916+00	3.994-02	2.011+10	3.909-03	5.619-03	8.739-03	1.291-02	1.769-02	2.293-02
3	59	7.923+00	7.187-02	1.208+10	8.137-03	1.083-02	1.620-02	2.361-02	3.218-02	4.157-02
3	60	7.946+00	6.778-03	1.146+09	1.494-03	1.482-03	1.816-03	2.437-03	3.207-03	4.073-03
3	61	7.947+00	3.390-02	3.439+09	5.113-03	5.800-03	7.944-03	1.118-02	1.508-02	1.943-02
3	62	8.052+00	1.044-03	1.088+08	2.489-03	1.463-03	8.916-04	6.617-04	6.156-04	6.669-04
3	63	8.192+00	1.711-04	9.224+07	9.134-04	5.527-04	3.129-04	1.938-04	1.418-04	1.284-04
3	64	8.415+00	4.744-02	8.996+09	6.902-03	1.029-02	1.479-02	2.031-02	2.640-02	3.257-02
3	65	8.514+00	2.829-05	1.647+07	9.512-04	5.104-04	2.553-04	1.305-04	7.072-05	4.164-05
3	66	8.630+00	0.000+00	5.456+06	9.731-03	1.236-02	1.539-02	1.815-02	2.057-02	2.270-02
3	67	8.630+00	0.000+00	1.469+06	8.785-03	7.585-03	7.786-03	8.440-03	9.208-03	9.986-03
3	68	8.639+00	0.000+00	1.768+04	5.080-03	2.678-03	1.521-03	8.982-04	5.692-04	3.957-04
3	69	8.641+00	0.000+00	3.391+06	1.260-02	1.576-02	1.979-02	2.351-02	2.687-02	2.988-02
3	70	8.673+00	0.000+00	5.866+05	5.948-02	6.322-02	6.620-02	6.839-02	6.979-02	7.066-02

Table II. Ca IX Oscillator Strengths, Radiative Decay Rates, and Collision Strengths for transitions involving the lowest 4 levels.

Low. Lev.	Upp. Lev.		Osc. Str.	Rad. Dec. Rate	Collision Strength Impact Electron Energy - Eo (Ry)				
i	j	Eo	gf	(1/s)	E	5.8	13.6	24.2	38.6	57.9
3	71	8.674+00	0.000+00	0.000+00	1.903-03	9.196-04	4.732-04	2.480-04	1.270-04	6.420-05
3	72	8.676+00	0.000+00	3.155+06	1.371-02	1.458-02	1.669-02	1.928-02	2.163-02	2.353-02
3	73	8.682+00	0.000+00	9.396+05	1.938-02	1.886-02	1.920-02	1.975-02	2.023-02	2.064-02
3	74	8.689+00	0.000+00	2.229+06	6.449-03	7.669-03	9.410-03	1.103-02	1.257-02	1.393-02
3	75	8.693+00	0.000+00	7.746+05	6.897-03	5.890-03	5.947-03	6.302-03	6.848-03	7.389-03
3	76	8.717+00	0.000+00	0.000+00	3.285-03	1.797-03	1.041-03	6.330-04	4.192-04	3.108-04
3	77	8.721+00	0.000+00	8.116+05	3.807-03	4.185-03	4.947-03	5.698-03	6.447-03	7.117-03
3	78	8.804+00	0.000+00	2.108+05	2.227-03	1.368-03	1.122-03	1.053-03	1.139-03	1.202-03
3	79	8.811+00	0.000+00	1.093+05	2.237-02	2.401-02	2.525-02	2.609-02	2.661-02	2.691-02
3	80	8.816+00	0.000+00	0.000+00	4.850-04	2.301-04	1.182-04	6.375-05	3.456-05	1.836-05
3	81	8.864+00	0.000+00	1.435+04	1.652-03	9.158-04	5.988-04	4.508-04	3.748-04	3.335-04
3	82	8.922+00	0.000+00	0.000+00	3.448-02	3.358-02	3.453-02	3.579-02	3.681-02	3.749-02
3	83	8.942+00	0.000+00	0.000+00	6.468-02	7.949-02	9.148-02	9.983-02	1.052-01	1.083-01
3	84	8.949+00	0.000+00	0.000+00	1.090-02	6.949-03	4.985-03	4.050-03	3.608-03	3.399-03
3	85	8.964+00	0.000+00	0.000+00	8.493-03	4.386-03	2.384-03	1.436-03	9.766-04	7.533-04
3	86	8.977+00	1.287-03	1.666+08	2.569-02	3.116-02	3.560-02	3.886-02	4.108-02	4.249-02
3	87	8.987+00	0.000+00	0.000+00	1.571-02	1.723-02	1.882-02	2.009-02	2.097-02	2.150-02
3	88	8.994+00	0.000+00	0.000+00	9.326-03	8.282-03	7.974-03	8.024-03	8.163-03	8.286-03
3	89	9.039+00	0.000+00	0.000+00	2.184-02	2.322-02	2.514-02	2.688-02	2.818-02	2.890-02
3	90	9.044+00	1.062-01	1.396+10	1.479-02	2.082-02	2.934-02	3.967-02	5.091-02	6.265-02
3	91	9.047+00	3.931-02	8.615+09	5.205-03	6.094-03	8.367-03	1.164-02	1.547-02	1.964-02
3	92	9.070+00	5.854-04	7.737+07	7.203-03	3.967-03	2.277-03	1.463-03	1.099-03	9.487-04
3	93	9.090+00	0.000+00	0.000+00	1.185-02	6.228-03	3.588-03	2.378-03	1.811-03	1.543-03
3	94	9.129+00	0.000+00	0.000+00	6.440-03	4.830-03	4.082-03	3.780-03	3.662-03	3.701-03
3	95	9.134+00	8.151-02	1.093+10	7.087-03	1.086-02	1.645-02	2.357-02	3.155-02	4.023-02
3	96	9.140+00	2.398-02	5.363+09	2.956-03	3.511-03	4.799-03	6.681-03	8.907-03	1.139-02
3	97	9.215+00	1.206-04	1.645+07	3.101-03	1.781-03	1.047-03	6.692-04	4.805-04	3.944-04
3	98	9.245+00	0.000+00	4.149+06	2.771-02	3.125-02	3.573-02	4.027-02	4.437-02	4.756-02
3	99	9.245+00	0.000+00	5.930+06	4.701-02	5.957-02	7.153-02	8.234-02	9.161-02	9.872-02
3	100	9.245+00	0.000+00	0.000+00	1.306-02	8.311-03	6.623-03	6.223-03	6.386-03	6.824-03
3	101	9.283+00	0.000+00	9.079+03	1.318-02	6.464-03	3.215-03	1.660-03	8.916-04	5.075-04
3	102	9.319+00	0.000+00	0.000+00	2.953-03	2.266-03	2.327-03	2.490-03	2.646-03	2.717-03
3	103	9.321+00	0.000+00	0.000+00	4.039-03	4.067-03	4.772-03	5.404-03	5.839-03	6.041-03
3	104	9.323+00	0.000+00	0.000+00	4.270-03	2.532-03	2.207-03	2.284-03	2.358-03	2.410-03
3	105	9.394+00	0.000+00	0.000+00	2.316-03	9.813-04	4.356-04	2.061-04	1.037-04	5.620-05
3	106	9.520+00	3.321-04	8.060+07	5.891-05	4.475-05	4.655-05	6.078-05	8.274-05	1.111-04
3	107	9.521+00	9.543-04	1.390+08	1.726-04	1.842-04	2.260-04	2.897-04	3.660-04	4.543-04
3	108	9.523+00	0.000+00	0.000+00	2.145-04	2.200-04	2.376-04	2.541-04	2.657-04	2.726-04
3	109	9.597+00	0.000+00	0.000+00	4.428-04	2.472-04	1.328-04	7.024-05	3.684-05	1.896-05
3	110	1.001+01	0.000+00	0.000+00	8.904-04	4.472-04	2.406-04	1.334-04	7.226-05	3.722-05
3	111	1.001+01	0.000+00	0.000+00	4.380-02	4.787-02	5.093-02	5.308-02	5.444-02	5.531-02
3	112	1.004+01	0.000+00	0.000+00	1.698-04	8.541-05	4.615-05	2.596-05	1.451-05	8.021-06
3	113	1.005+01	0.000+00	0.000+00	7.394-04	3.772-04	2.094-04	1.233-04	7.451-05	4.684-05
3	114	1.006+01	0.000+00	0.000+00	8.627-03	9.402-03	9.987-03	1.039-02	1.064-02	1.080-02
3	115	1.008+01	0.000+00	0.000+00	4.376-05	3.569-05	3.341-05	3.346-05	3.475-05	3.499-05

Table II. Ca IX Oscillator Strengths, Radiative Decay Rates, and Collision Strengths for transitions involving the lowest 4 levels.

Low. Lev.	Upp. Lev.		Osc. Str.	Rad. Dec. Rate	Collision Strength Impact Electron Energy - Eo (Ry)				
i	j	Eo	gf	(1/s)	E	5.8	13.6	24.2	38.6	57.9
3	116	1.008+01	0.000+00	0.000+00	2.568-05	1.872-05	1.621-05	1.570-05	1.599-05	1.605-05
3	117	1.008+01	0.000+00	0.000+00	1.464-05	1.249-05	1.196-05	1.200-05	1.266-05	1.287-05
3	118	1.010+01	0.000+00	1.512+04	4.623-05	4.614-05	5.115-05	5.876-05	6.574-05	7.084-05
3	119	1.010+01	0.000+00	2.537+04	8.923-05	1.121-04	1.359-04	1.609-04	1.823-04	1.968-04
3	120	1.011+01	0.000+00	0.000+00	2.652-05	1.787-05	1.477-05	1.408-05	1.467-05	1.554-05
3	121	1.019+01	0.000+00	0.000+00	9.791-05	4.925-05	2.658-05	1.485-05	8.117-06	4.106-06
3	122	1.019+01	0.000+00	0.000+00	6.353-03	7.041-03	7.546-03	7.897-03	8.123-03	8.267-03
3	123	1.020+01	0.000+00	0.000+00	1.982-04	1.079-04	6.686-05	4.626-05	3.491-05	2.863-05
3	124	1.022+01	0.000+00	0.000+00	3.003-05	1.893-05	1.471-05	1.377-05	1.378-05	1.436-05
3	125	1.028+01	1.328-02	3.760+09	2.054-03	1.860-03	2.150-03	2.887-03	3.896-03	5.030-03
3	126	1.031+01	3.829-04	1.089+08	1.610-03	9.457-04	5.315-04	3.310-04	2.487-04	2.263-04
3	127	1.031+01	0.000+00	0.000+00	2.801-04	1.566-04	1.013-04	7.459-05	6.011-05	5.259-05
3	128	1.031+01	7.084-02	1.210+10	4.717-03	6.364-03	9.639-03	1.449-02	2.035-02	2.663-02
3	129	1.033+01	1.837-02	1.573+10	1.098-03	1.542-03	2.400-03	3.658-03	5.174-03	6.810-03
3	130	1.034+01	3.081-02	8.821+09	1.774-03	2.544-03	3.985-03	6.079-03	8.600-03	1.131-02
3	131	1.034+01	0.000+00	0.000+00	9.575-04	5.509-04	2.930-04	1.577-04	8.953-05	5.598-05
3	132	1.036+01	4.765-03	8.212+08	1.056-03	8.269-04	8.243-04	1.027-03	1.351-03	1.742-03
3	133	1.037+01	5.079-03	1.463+09	5.998-04	5.783-04	7.063-04	9.771-04	1.339-03	1.746-03
3	134	1.042+01	2.187-03	3.812+08	1.193-03	7.852-04	6.011-04	6.033-04	7.105-04	8.681-04
3	135	1.046+01	3.113-04	2.738+08	2.323-04	1.491-04	1.045-04	9.353-05	1.018-04	1.209-04
3	136	1.068+01	0.000+00	1.811+06	3.981-03	3.365-03	3.442-03	3.799-03	4.198-03	4.601-03
3	137	1.069+01	0.000+00	1.619+04	3.398-03	1.697-03	9.161-04	5.134-04	2.994-04	1.881-04
3	138	1.069+01	0.000+00	5.576+06	3.415-03	4.478-03	5.660-03	6.890-03	7.946-03	8.872-03
3	139	1.069+01	0.000+00	5.601+06	8.127-03	1.026-02	1.283-02	1.556-02	1.794-02	2.003-02
3	140	1.072+01	0.000+00	2.704+06	2.306-03	3.231-03	4.190-03	5.162-03	5.992-03	6.716-03
3	141	1.073+01	0.000+00	3.259+05	1.525-03	1.056-03	9.206-04	9.224-04	9.724-04	1.043-03
3	142	1.074+01	0.000+00	0.000+00	1.566-03	7.825-04	4.156-04	2.226-04	1.196-04	6.508-05
3	143	1.075+01	0.000+00	1.964+06	2.234-03	2.564-03	3.085-03	3.689-03	4.226-03	4.719-03
3	144	1.076+01	0.000+00	0.000+00	1.096-04	6.933-05	4.585-05	3.334-05	2.706-05	2.410-05
3	145	1.076+01	0.000+00	6.749+05	8.852-04	7.627-04	7.847-04	8.655-04	9.544-04	1.045-03
3	146	1.077+01	0.000+00	0.000+00	1.693-04	8.265-05	4.292-05	2.247-05	1.171-05	5.914-06
3	147	1.078+01	0.000+00	2.605+05	2.056-03	1.316-03	1.031-03	9.421-04	9.338-04	9.672-04
3	148	1.080+01	0.000+00	0.000+00	1.849-05	1.132-05	8.203-06	7.381-06	7.562-06	7.917-06
3	149	1.080+01	0.000+00	0.000+00	3.223-05	2.431-05	2.179-05	2.261-05	2.475-05	2.689-05
3	150	1.080+01	0.000+00	0.000+00	2.048-05	1.108-05	6.220-06	3.995-06	3.037-06	2.520-06
3	151	1.081+01	0.000+00	0.000+00	3.303-03	2.935-03	2.789-03	2.778-03	2.830-03	2.905-03
3	152	1.081+01	0.000+00	0.000+00	2.932-03	3.392-03	3.765-03	4.083-03	4.343-03	4.555-03
3	153	1.082+01	0.000+00	0.000+00	2.493-04	1.399-04	7.515-05	3.939-05	2.036-05	1.040-05
3	154	1.082+01	0.000+00	0.000+00	6.753-06	3.338-06	1.652-06	9.336-07	6.352-07	4.931-07
3	155	1.083+01	0.000+00	0.000+00	5.824-03	4.871-03	4.418-03	4.280-03	4.296-03	4.376-03
3	156	1.083+01	0.000+00	1.027+05	8.338-04	4.636-04	3.014-04	2.307-04	1.992-04	1.888-04
3	157	1.084+01	0.000+00	0.000+00	3.133-03	2.144-03	1.820-03	1.729-03	1.810-03	1.884-03
3	158	1.084+01	0.000+00	0.000+00	5.165-03	2.884-03	1.561-03	8.444-04	4.731-04	2.837-04
3	159	1.084+01	6.200-05	1.170+07	7.535-03	8.666-03	9.604-03	1.040-02	1.106-02	1.160-02
3	160	1.084+01	0.000+00	0.000+00	4.294-03	4.220-03	4.316-03	4.471-03	4.892-03	5.187-03

Table II. Ca IX Oscillator Strengths, Radiative Decay Rates, and Collision Strengths for transitions involving the lowest 4 levels.

Low. Lev.	Upp. Lev.		Osc. Str.	Rad. Dec. Rate	Collision Strength Impact Electron Energy - Eo (Ry)					
i	j	Eo	gf	(1/s)	E	5.8	13.6	24.2	38.6	57.9
3	161	1.084+01	0.000+00	0.000+00	1.322-02	1.515-02	1.678-02	1.815-02	1.928-02	2.021-02
3	162	1.085+01	0.000+00	0.000+00	2.303-03	1.164-03	7.531-04	6.008-04	5.632-04	5.559-04
3	163	1.086+01	0.000+00	0.000+00	2.206-03	2.401-03	2.545-03	2.674-03	2.947-03	3.133-03
3	164	1.087+01	0.000+00	0.000+00	4.211-03	5.165-03	5.900-03	6.482-03	6.936-03	7.293-03
3	165	1.087+01	0.000+00	0.000+00	2.516-03	1.900-03	1.582-03	1.443-03	1.398-03	1.396-03
3	166	1.087+01	0.000+00	0.000+00	8.930-04	3.571-04	1.552-04	7.276-05	3.336-05	1.575-05
3	167	1.088+01	0.000+00	0.000+00	7.555-04	8.017-04	8.449-04	8.864-04	9.755-04	1.037-03
3	168	1.088+01	0.000+00	0.000+00	7.626-04	3.147-04	1.510-04	8.385-05	5.476-05	4.219-05
3	169	1.088+01	0.000+00	0.000+00	2.294-03	1.260-03	6.636-04	3.429-04	1.771-04	9.198-05
3	170	1.089+01	0.000+00	0.000+00	1.031-03	1.016-03	1.038-03	1.075-03	1.176-03	1.247-03
3	171	1.090+01	1.411-04	4.488+07	2.857-05	2.195-05	2.269-05	2.894-05	3.833-05	4.902-05
3	172	1.090+01	0.000+00	0.000+00	5.182-03	5.633-03	6.091-03	6.519-03	6.891-03	7.208-03
3	173	1.091+01	8.935-04	1.708+08	2.462-03	2.240-03	2.193-03	2.254-03	2.365-03	2.495-03
3	174	1.092+01	3.239-04	1.033+08	7.069-04	4.145-04	2.548-04	1.798-04	1.536-04	1.537-04
3	175	1.092+01	0.000+00	0.000+00	1.311-03	1.347-03	1.401-03	1.459-03	1.602-03	1.698-03
3	176	1.092+01	0.000+00	0.000+00	8.443-04	3.856-04	2.226-04	1.611-04	1.409-04	1.339-04
3	177	1.093+01	0.000+00	0.000+00	3.248-04	1.275-04	5.662-05	2.918-05	1.690-05	1.163-05
3	178	1.094+01	0.000+00	0.000+00	5.648-04	5.322-04	5.360-04	5.504-04	6.013-04	6.359-04
3	179	1.094+01	0.000+00	0.000+00	3.644-03	2.285-03	1.524-03	1.124-03	9.302-04	8.433-04
3	180	1.095+01	0.000+00	0.000+00	2.456-04	1.571-04	1.100-04	8.578-05	7.483-05	7.081-05
3	181	1.095+01	0.000+00	0.000+00	9.290-05	5.250-05	2.961-05	1.759-05	1.160-05	8.647-06
3	182	1.095+01	0.000+00	0.000+00	2.539-04	2.784-04	3.022-04	3.237-04	3.419-04	3.570-04
3	183	1.096+01	0.000+00	0.000+00	1.802-03	1.215-03	9.020-04	7.434-04	6.731-04	6.484-04
3	184	1.106+01	1.787-05	5.854+06	3.386-05	2.507-05	2.085-05	1.965-05	1.984-05	2.058-05
3	185	1.106+01	2.579-05	2.534+07	2.647-05	2.348-05	2.257-05	2.321-05	2.459-05	2.622-05
3	186	1.106+01	2.654-05	5.216+06	5.541-05	4.202-05	3.565-05	3.377-05	3.401-05	3.509-05
3	187	1.107+01	0.000+00	0.000+00	1.372-04	7.121-05	3.696-05	2.000-05	1.198-05	8.011-06
3	188	1.109+01	0.000+00	0.000+00	3.461-04	1.882-04	1.007-04	5.436-05	3.108-05	1.952-05
3	189	1.110+01	0.000+00	0.000+00	5.732-05	2.013-05	7.831-06	3.486-06	1.545-06	7.385-07
3	190	1.115+01	0.000+00	0.000+00	2.603-04	2.618-04	2.677-04	2.757-04	3.016-04	3.164-04
3	191	1.115+01	0.000+00	0.000+00	7.314-05	6.015-05	5.802-05	5.935-05	6.311-05	6.420-05
3	192	1.115+01	0.000+00	0.000+00	7.830-05	3.740-05	2.188-05	1.524-05	1.290-05	1.164-05
3	193	1.115+01	0.000+00	0.000+00	1.062-04	1.146-04	1.260-04	1.378-04	1.522-04	1.580-04
3	194	1.115+01	0.000+00	0.000+00	2.569-04	3.021-04	3.248-04	3.416-04	3.766-04	3.968-04
3	195	1.115+01	0.000+00	0.000+00	1.289-04	4.795-05	2.027-05	9.888-06	5.183-06	3.353-06
3	196	1.119+01	0.000+00	0.000+00	1.250-05	7.211-06	4.259-06	2.653-06	1.776-06	1.325-06
3	197	1.126+01	0.000+00	0.000+00	2.596-05	2.347-05	2.253-05	2.278-05	2.491-05	2.589-05
3	198	1.126+01	0.000+00	0.000+00	2.667-05	2.238-05	2.107-05	2.114-05	2.307-05	2.394-05
3	199	1.127+01	0.000+00	0.000+00	2.525-05	9.714-06	4.500-06	2.747-06	2.092-06	1.843-06
3	200	1.128+01	0.000+00	0.000+00	6.366-06	6.890-06	7.466-06	9.392-06	1.000-05	1.106-05
3	201	1.128+01	0.000+00	0.000+00	9.245-06	7.820-06	7.505-06	8.872-06	9.088-06	9.885-06
3	202	1.128+01	0.000+00	0.000+00	7.267-06	4.655-06	3.292-06	2.904-06	2.592-06	2.561-06
3	203	1.131+01	0.000+00	0.000+00	2.316-05	1.809-05	1.641-05	1.657-05	1.751-05	1.751-05
3	204	1.131+01	0.000+00	0.000+00	1.842-05	1.899-05	2.009-05	2.131-05	2.209-05	2.277-05
3	205	1.131+01	0.000+00	0.000+00	1.883-06	1.030-06	5.736-07	3.252-07	1.840-07	1.023-07

Table II. Ca IX Oscillator Strengths, Radiative Decay Rates, and Collision Strengths for transitions involving the lowest 4 levels.

Low. Lev.	Upp. Lev.		Osc. Str.	Rad. Dec. Rate	Collision Strength Impact Electron Energy - Eo (Ry)				
i	j	Eo	gf	(1/s)	E	5.8	13.6	24.2	38.6	57.9
3	206	1.134+01	0.000+00	0.000+00	5.716-05	2.791-05	1.411-05	7.194-06	3.824-06	2.037-06
3	207	1.135+01	0.000+00	0.000+00	2.167-05	1.143-05	5.684-06	2.850-06	1.489-06	8.193-07
3	208	1.145+01	0.000+00	0.000+00	6.991-06	4.115-06	2.780-06	2.140-06	2.030-06	2.132-06
3	209	1.148+01	0.000+00	0.000+00	6.788-05	2.380-05	9.697-06	4.373-06	2.333-06	1.553-06
3	210	1.225+01	0.000+00	0.000+00	6.058-06	4.473-06	3.609-06	3.132-06	2.950-06	3.017-06
3	211	1.225+01	0.000+00	0.000+00	1.307-05	1.184-05	1.142-05	1.132-05	1.157-05	1.225-05
3	212	1.225+01	0.000+00	0.000+00	5.262-06	4.648-06	4.850-06	5.459-06	6.101-06	6.619-06
3	213	1.228+01	0.000+00	0.000+00	1.274-05	6.690-06	3.511-06	1.895-06	1.073-06	6.045-07
3	214	1.250+01	0.000+00	0.000+00	4.888-06	2.533-06	1.422-06	9.000-07	6.462-07	5.104-07
3	215	1.252+01	0.000+00	0.000+00	6.024-06	4.624-06	4.671-06	5.186-06	5.844-06	6.701-06
3	216	1.252+01	0.000+00	0.000+00	6.445-06	3.360-06	1.971-06	1.303-06	9.739-07	8.295-07
3	217	1.252+01	0.000+00	0.000+00	6.031-06	5.131-06	5.528-06	6.324-06	7.108-06	7.988-06
3	218	1.253+01	0.000+00	0.000+00	8.179-06	7.117-06	7.406-06	8.439-06	9.565-06	1.025-05
3	219	1.253+01	0.000+00	4.244+03	8.916-06	9.548-06	1.122-05	1.362-05	1.591-05	1.721-05
3	220	1.254+01	0.000+00	0.000+00	3.215-06	1.714-06	1.028-06	7.480-07	6.529-07	6.443-07
3	221	1.257+01	0.000+00	9.109+03	3.772-06	2.913-06	2.720-06	2.672-06	2.678-06	2.695-06
3	222	1.257+01	0.000+00	5.046+03	8.573-06	8.098-06	8.093-06	8.162-06	8.167-06	8.101-06
3	223	1.257+01	0.000+00	0.000+00	1.250-06	6.088-07	2.999-07	1.503-07	7.652-08	3.769-08
3	224	1.259+01	0.000+00	0.000+00	2.807-05	1.557-05	8.839-06	5.030-06	2.892-06	1.629-06
3	225	1.262+01	0.000+00	0.000+00	1.006-05	5.415-06	3.052-06	1.826-06	1.174-06	7.887-07
3	226	1.285+01	0.000+00	0.000+00	4.645-06	2.590-06	1.409-06	7.691-07	4.349-07	2.607-07
3	227	1.287+01	0.000+00	0.000+00	3.252-06	2.419-06	2.497-06	3.140-06	4.015-06	5.035-06
3	228	1.287+01	2.249-05	5.982+06	5.299-06	5.530-06	7.403-06	1.044-05	1.387-05	1.764-05
3	229	1.287+01	0.000+00	0.000+00	4.358-06	2.924-06	2.242-06	2.045-06	2.087-06	2.238-06
3	230	1.288+01	0.000+00	0.000+00	1.500-05	1.074-05	8.555-06	7.577-06	7.256-06	7.326-06
3	231	1.288+01	0.000+00	0.000+00	1.299-05	1.100-05	1.046-05	1.062-05	1.113-05	1.183-05
3	232	1.288+01	0.000+00	0.000+00	6.251-06	3.720-06	2.245-06	1.423-06	1.004-06	7.460-07
3	233	1.288+01	0.000+00	0.000+00	1.661-06	9.014-07	5.064-07	3.103-07	2.183-07	1.694-07
3	234	1.291+01	0.000+00	0.000+00	2.921-06	2.997-06	4.074-06	5.513-06	6.691-06	7.525-06
3	235	1.292+01	0.000+00	0.000+00	4.761-06	3.065-06	2.254-06	1.947-06	1.907-06	2.008-06
3	236	1.292+01	0.000+00	0.000+00	5.307-06	2.979-06	1.660-06	9.532-07	5.917-07	4.136-07
3	237	1.292+01	0.000+00	0.000+00	4.059-06	2.727-06	2.097-06	1.865-06	1.846-06	1.943-06
3	238	1.298+01	0.000+00	0.000+00	1.153-05	6.820-06	4.551-06	3.618-06	3.444-06	3.681-06
3	239	1.298+01	9.229-05	1.249+08	4.579-06	5.658-06	7.292-06	9.400-06	1.206-05	1.541-05
3	240	1.298+01	7.079-05	3.194+07	5.398-06	5.252-06	5.990-06	7.328-06	9.200-06	1.165-05
3	241	1.298+01	1.045-04	2.829+07	6.632-06	7.133-06	8.587-06	1.077-05	1.366-05	1.739-05
3	242	1.299+01	0.000+00	0.000+00	1.461-05	8.503-06	4.843-06	2.739-06	1.548-06	8.756-07
3	243	1.301+01	0.000+00	0.000+00	7.757-06	4.036-06	2.170-06	1.298-06	8.946-07	7.159-07
3	244	1.301+01	0.000+00	0.000+00	1.711-05	1.328-05	1.220-05	1.224-05	1.288-05	1.399-05
3	245	1.302+01	0.000+00	0.000+00	1.392-05	1.409-05	1.581-05	1.759-05	1.955-05	2.180-05
3	246	1.302+01	0.000+00	0.000+00	6.633-06	3.534-06	1.872-06	1.040-06	6.147-07	3.624-07
3	247	1.302+01	0.000+00	0.000+00	1.545-05	1.663-05	1.926-05	2.211-05	2.496-05	2.703-05
3	248	1.302+01	0.000+00	0.000+00	2.284-05	3.011-05	3.798-05	4.518-05	5.175-05	5.647-05
3	249	1.302+01	0.000+00	0.000+00	7.557-06	4.992-06	3.877-06	3.511-06	3.543-06	3.792-06
3	250	1.305+01	0.000+00	0.000+00	5.224-06	2.721-06	1.448-06	8.462-07	5.567-07	4.184-07

Table II. Ca IX Oscillator Strengths, Radiative Decay Rates, and Collision Strengths for transitions involving the lowest 4 levels.

Low. Lev.	Upp. Lev.		Osc. Str.	Rad. Dec. Rate	Collision Strength Impact Electron Energy - Eo (Ry)				
i	j	Eo	gf	(1/s)	E	5.8	13.6	24.2	38.6	57.9
3	251	1.306+01	0.000+00	0.000+00	2.867-06	1.348-06	6.297-07	3.127-07	1.887-07	1.325-07
3	252	1.307+01	0.000+00	0.000+00	8.093-06	6.012-06	5.715-06	6.007-06	6.513-06	7.197-06
3	253	1.307+01	0.000+00	0.000+00	2.795-06	2.093-06	2.032-06	2.324-06	2.560-06	2.685-06
3	254	1.307+01	0.000+00	0.000+00	8.150-06	4.252-06	2.264-06	1.312-06	8.625-07	6.561-07
3	255	1.307+01	0.000+00	0.000+00	2.904-06	1.389-06	6.735-07	3.619-07	2.376-07	1.827-07
3	256	1.307+01	0.000+00	0.000+00	6.601-06	5.389-06	5.421-06	5.830-06	6.344-06	7.011-06
3	257	1.307+01	0.000+00	0.000+00	2.492-06	2.032-06	2.049-06	2.353-06	2.584-06	2.702-06
3	258	1.307+01	0.000+00	0.000+00	1.393-06	6.280-07	3.699-07	3.177-07	3.577-07	3.899-07
3	259	1.307+01	0.000+00	0.000+00	1.254-06	6.733-07	5.212-07	5.615-07	7.076-07	7.810-07
3	260	1.307+01	0.000+00	0.000+00	9.742-07	5.323-07	3.868-07	3.678-07	3.896-07	3.963-07
3	261	1.309+01	0.000+00	0.000+00	9.437-07	3.932-07	1.691-07	8.649-08	5.265-08	4.206-08
3	262	1.309+01	0.000+00	5.491+04	8.024-06	1.106-05	1.437-05	1.779-05	2.125-05	2.423-05
3	263	1.309+01	0.000+00	0.000+00	6.212-06	5.147-06	5.138-06	5.655-06	6.352-06	6.972-06
3	264	1.309+01	0.000+00	2.443+04	9.167-06	1.041-05	1.261-05	1.526-05	1.808-05	2.057-05
3	265	1.309+01	0.000+00	0.000+00	4.036-06	2.348-06	1.444-06	9.480-07	6.944-07	5.529-07
3	266	1.309+01	0.000+00	0.000+00	5.919-06	4.136-06	3.556-06	3.706-06	3.926-06	4.050-06
3	267	1.309+01	0.000+00	0.000+00	7.378-07	8.816-07	1.130-06	1.367-06	1.597-06	1.652-06
3	268	1.309+01	0.000+00	0.000+00	9.392-07	4.652-07	2.802-07	2.238-07	2.141-07	2.067-07
3	269	1.309+01	0.000+00	0.000+00	1.145-06	9.412-07	9.410-07	1.014-06	1.123-06	1.132-06
3	270	1.309+01	0.000+00	0.000+00	4.703-06	3.957-06	4.052-06	4.676-06	5.165-06	5.426-06
3	271	1.309+01	0.000+00	0.000+00	2.193-06	1.095-06	5.728-07	3.163-07	2.035-07	1.594-07
3	272	1.310+01	0.000+00	0.000+00	1.258-05	1.555-05	1.907-05	2.230-05	2.526-05	2.711-05
3	273	1.310+01	0.000+00	0.000+00	1.123-05	1.403-05	1.859-05	2.546-05	3.538-05	4.712-05
3	274	1.310+01	0.000+00	0.000+00	4.216-07	2.163-07	1.083-07	5.665-08	2.872-08	1.428-08
3	275	1.310+01	0.000+00	0.000+00	1.761-05	8.769-06	4.314-06	2.162-06	1.052-06	4.898-07
3	276	1.311+01	0.000+00	0.000+00	4.232-06	2.064-06	9.824-07	4.436-07	2.030-07	9.268-08
3	277	1.312+01	0.000+00	0.000+00	2.113-06	1.474-06	1.267-06	1.307-06	1.481-06	1.555-06
3	278	1.312+01	0.000+00	0.000+00	1.450-06	1.046-06	1.037-06	1.388-06	1.878-06	2.175-06
3	279	1.312+01	0.000+00	0.000+00	4.779-07	2.843-07	2.350-07	3.050-07	4.236-07	5.076-07
3	280	1.313+01	0.000+00	0.000+00	2.004-06	1.155-06	6.823-07	3.925-07	2.322-07	1.538-07
3	281	1.314+01	0.000+00	0.000+00	2.836-06	1.430-06	7.504-07	4.492-07	3.327-07	2.881-07
3	282	1.317+01	0.000+00	0.000+00	1.610-05	9.039-06	4.951-06	2.775-06	1.571-06	9.156-07
3	283	1.317+01	0.000+00	0.000+00	4.297-06	2.899-06	2.379-06	2.329-06	2.744-06	3.397-06
4	5	6.463-01	0.000+00	0.000+00	7.243-02	3.678-02	1.915-02	1.017-02	5.530-03	3.123-03
4	6	1.719+00	4.816-02	2.287+08	3.942-01	4.083-01	4.346-01	4.703-01	5.108-01	5.519-01
4	7	1.764+00	0.000+00	0.000+00	5.508-03	3.178-03	1.708-03	9.141-04	4.934-04	2.668-04
4	8	1.782+00	4.513-01	3.839+09	2.525+00	3.067+00	3.560+00	4.021+00	4.458+00	4.869+00
4	9	1.814+00	1.333+00	7.045+09	7.265+00	8.823+00	1.024+01	1.157+01	1.284+01	1.402+01
4	10	2.333+00	0.000+00	0.000+00	1.007-02	5.799-03	3.119-03	1.664-03	8.914-04	4.764-04
4	11	2.420+00	2.304-02	3.612+08	1.525-01	1.630-01	1.789-01	1.971-01	2.160-01	2.342-01
4	12	2.421+00	3.464-01	3.262+09	1.264+00	1.521+00	1.771+00	2.012+00	2.245+00	2.469+00
4	13	2.423+00	1.946+00	1.310+10	6.570+00	8.104+00	9.539+00	1.089+01	1.219+01	1.343+01
4	14	2.971+00	0.000+00	0.000+00	5.154-02	2.695-02	1.402-02	7.430-03	4.120-03	2.458-03
4	15	3.789+00	0.000+00	2.428+04	2.416-02	2.577-02	2.714-02	2.832-02	2.926-02	2.994-02
4	16	3.807+00	0.000+00	1.390+05	1.772-01	1.946-01	2.079-01	2.185-01	2.265-01	2.321-01

Table II. Ca IX Oscillator Strengths, Radiative Decay Rates, and Collision Strengths for transitions involving the lowest 4 levels.

Low. Lev.	Upp. Lev.		Osc. Str.	Rad. Dec. Rate	Collision Strength Impact Electron Energy - Eo (Ry)					
i	j	Eo	gf	(1/s)	E	5.8	13.6	24.2	38.6	57.9
4	17	3.829+00	0.000+00	4.708+05	6.817-01	7.831-01	8.565-01	9.112-01	9.508-01	9.776-01
4	18	3.865+00	0.000+00	1.762+03	3.070-02	1.886-02	1.153-02	7.237-03	4.858-03	3.581-03
4	19	4.121+00	0.000+00	1.796+04	2.011-02	1.813-02	1.712-02	1.673-02	1.667-02	1.672-02
4	20	4.131+00	0.000+00	6.953+04	2.955-02	3.088-02	3.216-02	3.338-02	3.443-02	3.520-02
4	21	4.147+00	0.000+00	4.719+05	5.201-02	6.003-02	6.600-02	7.051-02	7.381-02	7.606-02
4	22	4.156+00	0.000+00	4.040+05	1.316-01	1.514-01	1.662-01	1.773-01	1.856-01	1.912-01
4	23	4.160+00	0.000+00	4.317+05	2.297-01	2.652-01	2.915-01	3.113-01	3.258-01	3.358-01
4	24	4.161+00	0.000+00	3.368+05	2.528-01	2.895-01	3.170-01	3.378-01	3.532-01	3.638-01
4	25	4.587+00	0.000+00	0.000+00	4.518-02	2.614-02	1.460-02	7.939-03	4.262-03	2.276-03
4	26	4.679+00	0.000+00	0.000+00	1.175-02	6.907-03	3.910-03	2.146-03	1.162-03	6.295-04
4	27	5.577+00	4.610-01	3.840+10	8.997-02	1.664-01	2.551-01	3.524-01	4.511-01	5.526-01
4	28	5.719+00	0.000+00	0.000+00	5.881-03	3.253-03	1.627-03	7.930-04	3.790-04	1.795-04
4	29	6.219+00	0.000+00	4.967+06	1.737-02	2.105-02	2.560-02	2.940-02	3.238-02	3.456-02
4	30	6.221+00	0.000+00	3.344+06	4.525-02	4.728-02	5.405-02	6.051-02	6.587-02	6.994-02
4	31	6.230+00	0.000+00	0.000+00	2.780-04	2.540-04	2.458-04	2.462-04	2.508-04	2.567-04
4	32	6.231+00	0.000+00	0.000+00	6.052-04	5.989-04	6.108-04	6.296-04	6.513-04	6.719-04
4	33	6.233+00	0.000+00	1.732+06	8.396-01	8.914-01	9.263-01	9.472-01	9.589-01	9.647-01
4	34	6.234+00	0.000+00	0.000+00	8.753-04	8.217-04	8.133-04	8.258-04	8.481-04	8.721-04
4	35	6.243+00	0.000+00	3.767+05	2.389-02	1.439-02	1.065-02	9.074-03	8.469-03	8.320-03
4	36	6.415+00	0.000+00	0.000+00	1.310-03	7.027-04	3.652-04	1.879-04	9.589-05	4.821-05
4	37	6.416+00	0.000+00	0.000+00	8.328-04	4.113-04	2.016-04	9.947-05	4.978-05	2.494-05
4	38	6.442+00	1.983-04	2.204+07	7.042-05	8.484-05	1.088-04	1.405-04	1.741-04	2.111-04
4	39	6.442+00	0.000+00	0.000+00	7.531-06	3.874-06	1.958-06	1.003-06	5.298-07	2.986-07
4	40	6.444+00	6.520-04	4.349+07	2.145-04	2.725-04	3.566-04	4.626-04	5.737-04	6.956-04
4	41	6.940+00	0.000+00	0.000+00	5.839-05	3.253-05	1.698-05	8.468-06	3.998-06	2.002-06
4	42	7.013+00	1.024-02	1.348+09	2.127-02	2.105-02	2.267-02	2.448-02	2.639-02	2.843-02
4	43	7.014+00	1.522-01	1.203+10	4.017-02	4.927-02	6.577-02	8.613-02	1.086-01	1.328-01
4	44	7.015+00	8.426-01	4.759+10	8.571-02	1.528-01	2.478-01	3.614-01	4.849-01	6.174-01
4	45	7.030+00	0.000+00	0.000+00	2.421-02	1.288-02	6.619-03	3.357-03	1.661-03	8.177-04
4	46	7.239+00	0.000+00	2.303+04	4.476-05	4.498-05	5.192-05	5.884-05	6.523-05	7.039-05
4	47	7.250+00	0.000+00	1.643+04	1.873-03	9.952-04	5.954-04	3.921-04	2.816-04	2.237-04
4	48	7.283+00	0.000+00	7.482+03	4.478-01	4.838-01	5.077-01	5.224-01	5.308-01	5.351-01
4	49	7.358+00	0.000+00	1.249+06	4.354-02	4.317-02	4.689-02	5.187-02	5.687-02	6.079-02
4	50	7.358+00	0.000+00	6.246+06	1.226-01	1.443-01	1.696-01	1.939-01	2.133-01	2.287-01
4	51	7.358+00	0.000+00	1.874+07	3.478-01	4.638-01	5.706-01	6.633-01	7.329-01	7.874-01
4	52	7.373+00	0.000+00	0.000+00	5.651-03	2.851-03	1.534-03	8.447-04	4.514-04	2.312-04
4	53	7.455+00	0.000+00	0.000+00	4.626-02	2.097-02	9.722-03	4.636-03	2.194-03	1.000-03
4	54	7.754+00	0.000+00	0.000+00	2.210-03	1.288-03	7.034-04	3.957-04	2.413-04	1.683-04
4	55	7.808+00	1.816-03	2.965+08	2.133-03	1.553-03	1.307-03	1.307-03	1.437-03	1.640-03
4	56	7.820+00	2.314-02	2.273+09	5.088-03	5.255-03	6.635-03	8.913-03	1.166-02	1.472-02
4	57	7.850+00	1.944-01	1.374+10	2.554-02	3.269-02	4.752-02	6.808-02	9.173-02	1.176-01
4	58	7.887+00	0.000+00	0.000+00	4.560-04	2.576-04	1.328-04	6.670-05	3.326-05	1.699-05
4	59	7.894+00	2.531-03	4.223+08	2.035-03	1.375-03	1.080-03	1.070-03	1.235-03	1.500-03
4	60	7.916+00	1.259-01	2.113+10	1.310-02	1.836-02	2.812-02	4.137-02	5.652-02	7.307-02
4	61	7.918+00	1.600-01	1.612+10	1.861-02	2.427-02	3.601-02	5.230-02	7.127-02	9.215-02

Table II. Ca IX Oscillator Strengths, Radiative Decay Rates, and Collision Strengths for transitions involving the lowest 4 levels.

Low. Lev.	Upp. Lev.		Osc. Str.	Rad. Dec. Rate	Collision Strength Impact Electron Energy - Eo (Ry)					
i	j	Eo	gf	(1/s)	E	5.8	13.6	24.2	38.6	57.9
4	62	8.023+00	1.112-03	1.150+08	5.752-03	3.312-03	1.865-03	1.179-03	9.104-04	8.564-04
4	63	8.163+00	0.000+00	0.000+00	1.849-03	1.086-03	5.677-04	2.861-04	1.421-04	7.181-05
4	64	8.386+00	7.864-02	1.481+10	1.172-02	1.754-02	2.517-02	3.446-02	4.467-02	5.500-02
4	65	8.485+00	0.000+00	0.000+00	1.544-03	8.249-04	4.026-04	1.963-04	9.674-05	4.471-05
4	66	8.600+00	0.000+00	4.790+05	1.490-03	1.268-03	1.327-03	1.450-03	1.601-03	1.759-03
4	67	8.601+00	0.000+00	6.429+05	7.364-03	7.738-03	8.360-03	8.928-03	9.429-03	9.872-03
4	68	8.609+00	0.000+00	8.956+05	4.685-03	4.198-03	4.465-03	4.928-03	5.430-03	5.941-03
4	69	8.612+00	0.000+00	2.341+06	9.695-03	1.160-02	1.428-02	1.688-02	1.919-02	2.130-02
4	70	8.644+00	0.000+00	6.620+06	1.760-02	1.846-02	2.104-02	2.423-02	2.712-02	2.956-02
4	71	8.645+00	0.000+00	8.818+06	6.750-03	7.843-03	9.313-03	1.092-02	1.232-02	1.345-02
4	72	8.647+00	0.000+00	4.551+06	1.279-01	1.368-01	1.454-01	1.528-01	1.584-01	1.625-01
4	73	8.653+00	0.000+00	1.037+06	1.188-02	7.533-03	5.816-03	5.213-03	5.079-03	5.148-03
4	74	8.660+00	0.000+00	8.830+05	6.555-03	5.154-03	4.931-03	5.087-03	5.435-03	5.849-03
4	75	8.664+00	0.000+00	2.911+06	1.223-02	1.422-02	1.730-02	2.027-02	2.306-02	2.556-02
4	76	8.688+00	0.000+00	4.427+06	2.483-02	2.847-02	3.438-02	4.001-02	4.546-02	5.029-02
4	77	8.692+00	0.000+00	3.185+05	1.317-02	7.877-03	5.395-03	4.132-03	3.575-03	3.382-03
4	78	8.775+00	0.000+00	3.883+05	4.655-02	4.888-02	5.103-02	5.257-02	5.358-02	5.420-02
4	79	8.782+00	0.000+00	8.313+05	2.760-03	2.038-03	2.002-03	2.106-03	2.359-03	2.593-03
4	80	8.787+00	0.000+00	1.099+06	8.332-04	7.188-04	7.904-04	8.791-04	1.012-03	1.128-03
4	81	8.835+00	0.000+00	7.424+03	2.446-03	1.176-03	6.129-04	3.433-04	2.030-04	1.221-04
4	82	8.893+00	0.000+00	0.000+00	2.248-03	2.287-03	2.485-03	2.673-03	2.804-03	2.885-03
4	83	8.913+00	0.000+00	0.000+00	2.125-02	2.010-02	2.048-02	2.116-02	2.172-02	2.209-02
4	84	8.920+00	1.254-03	1.144+08	1.166-02	6.224-03	3.399-03	2.049-03	1.441-03	1.210-03
4	85	8.934+00	0.000+00	0.000+00	1.100-01	1.272-01	1.428-01	1.542-01	1.616-01	1.660-01
4	86	8.948+00	4.230-04	5.441+07	8.225-03	7.798-03	7.849-03	8.070-03	8.298-03	8.488-03
4	87	8.958+00	3.024-03	2.785+08	2.907-02	3.032-02	3.236-02	3.433-02	3.590-02	3.706-02
4	88	8.965+00	0.000+00	0.000+00	5.851-02	6.667-02	7.409-02	7.970-02	8.351-02	8.586-02
4	89	9.010+00	1.756-01	1.636+10	4.126-02	5.208-02	6.741-02	8.568-02	1.052-01	1.252-01
4	90	9.015+00	3.541-02	4.623+09	3.407-02	3.847-02	4.419-02	5.011-02	5.567-02	6.062-02
4	91	9.018+00	2.653-03	5.777+08	2.224-02	2.439-02	2.691-02	2.916-02	3.088-02	3.197-02
4	92	9.041+00	4.628-04	6.077+07	1.280-02	6.547-03	3.336-03	1.747-03	9.872-04	6.293-04
4	93	9.061+00	0.000+00	0.000+00	2.500-02	1.205-02	5.747-03	2.744-03	1.287-03	5.802-04
4	94	9.100+00	1.755-01	1.668+10	1.804-02	2.563-02	3.742-02	5.272-02	6.997-02	8.875-02
4	95	9.105+00	2.718-02	3.620+09	1.041-02	1.060-02	1.209-02	1.441-02	1.711-02	2.015-02
4	96	9.111+00	1.600-03	3.556+08	6.611-03	6.239-03	6.332-03	6.596-03	6.879-03	7.223-03
4	97	9.186+00	0.000+00	0.000+00	6.884-03	3.734-03	1.963-03	1.029-03	5.445-04	3.025-04
4	98	9.216+00	0.000+00	5.815+05	1.364-02	1.141-02	1.147-02	1.231-02	1.340-02	1.453-02
4	99	9.216+00	0.000+00	2.904+06	3.641-02	3.756-02	4.150-02	4.621-02	5.076-02	5.452-02
4	100	9.216+00	0.000+00	8.720+06	9.715-02	1.172-01	1.380-01	1.574-01	1.744-01	1.874-01
4	101	9.254+00	0.000+00	0.000+00	2.194-02	1.069-02	5.224-03	2.588-03	1.292-03	6.287-04
4	102	9.290+00	0.000+00	0.000+00	4.775-03	3.247-03	3.141-03	3.391-03	3.563-03	3.664-03
4	103	9.292+00	0.000+00	0.000+00	6.046-03	4.227-03	4.130-03	4.420-03	4.668-03	4.796-03
4	104	9.294+00	0.000+00	0.000+00	7.416-03	6.419-03	7.078-03	7.842-03	8.452-03	8.728-03
4	105	9.364+00	0.000+00	0.000+00	4.017-03	1.737-03	7.836-04	3.687-04	1.795-04	9.160-05
4	106	9.491+00	0.000+00	0.000+00	1.878-04	2.041-04	2.278-04	2.481-04	2.626-04	2.722-04

Table II. Ca IX Oscillator Strengths, Radiative Decay Rates, and Collision Strengths for transitions involving the lowest 4 levels.

Low. Lev.	Upp. Lev.		Osc. Str.	Rad. Dec. Rate	Collision Strength Impact Electron Energy - Eo (Ry)					
i	j	Eo	gf	(1/s)	E	5.8	13.6	24.2	38.6	57.9
4	107	9.492+00	3.520-04	5.096+07	2.637-04	2.682-04	2.965-04	3.332-04	3.711-04	4.098-04
4	108	9.494+00	1.874-03	1.938+08	3.307-04	3.215-04	3.803-04	4.913-04	6.336-04	8.032-04
4	109	9.568+00	0.000+00	0.000+00	7.259-04	4.039-04	2.168-04	1.142-04	5.910-05	2.969-05
4	110	9.981+00	0.000+00	0.000+00	4.946-06	4.069-06	4.029-06	4.270-06	4.497-06	4.704-06
4	111	9.984+00	0.000+00	0.000+00	1.138-04	5.946-05	3.483-05	2.254-05	1.578-05	1.215-05
4	112	1.001+01	0.000+00	0.000+00	1.494-02	1.630-02	1.734-02	1.806-02	1.852-02	1.881-02
4	113	1.002+01	0.000+00	0.000+00	6.740-02	7.357-02	7.824-02	8.151-02	8.359-02	8.490-02
4	114	1.003+01	0.000+00	0.000+00	2.719-03	1.367-03	7.367-04	4.106-04	2.245-04	1.176-04
4	115	1.005+01	0.000+00	0.000+00	4.132-05	2.426-05	1.651-05	1.273-05	1.094-05	9.726-06
4	116	1.005+01	0.000+00	0.000+00	7.480-04	8.147-04	8.689-04	9.100-04	9.402-04	9.597-04
4	117	1.005+01	0.000+00	0.000+00	7.557-05	7.260-05	7.480-05	7.931-05	8.520-05	8.720-05
4	118	1.007+01	0.000+00	0.000+00	2.306-05	1.872-05	1.822-05	1.929-05	2.115-05	2.308-05
4	119	1.007+01	0.000+00	9.627+03	5.128-05	4.619-05	4.887-05	5.505-05	6.155-05	6.690-05
4	120	1.008+01	0.000+00	3.441+04	1.601-04	1.849-04	2.185-04	2.572-04	2.907-04	3.141-04
4	121	1.016+01	0.000+00	0.000+00	7.356-06	7.883-06	8.683-06	9.441-06	1.012-05	1.071-05
4	122	1.016+01	0.000+00	0.000+00	1.718-04	9.587-05	6.175-05	4.483-05	3.566-05	3.068-05
4	123	1.017+01	0.000+00	0.000+00	1.553-02	1.696-02	1.805-02	1.883-02	1.932-02	1.964-02
4	124	1.019+01	0.000+00	0.000+00	3.854-05	1.923-05	9.747-06	5.317-06	2.831-06	1.597-06
4	125	1.025+01	4.463-05	1.256+07	3.274-04	1.921-04	1.066-04	6.397-05	4.462-05	3.727-05
4	126	1.028+01	0.000+00	0.000+00	4.690-04	2.696-04	1.429-04	7.649-05	4.271-05	2.616-05
4	127	1.028+01	0.000+00	0.000+00	4.691-04	2.297-04	1.203-04	6.493-05	3.416-05	1.680-05
4	128	1.028+01	2.785-03	4.731+08	8.934-04	6.700-04	6.181-04	7.156-04	9.004-04	1.124-03
4	129	1.030+01	0.000+00	0.000+00	1.611-04	9.195-05	4.738-05	2.394-05	1.197-05	5.846-06
4	130	1.031+01	7.819-03	2.226+09	1.911-03	1.497-03	1.482-03	1.827-03	2.383-03	3.046-03
4	131	1.032+01	1.023-01	1.249+10	8.255-03	1.006-02	1.441-02	2.122-02	2.959-02	3.859-02
4	132	1.033+01	8.468-02	1.451+10	6.244-03	7.813-03	1.146-02	1.709-02	2.400-02	3.149-02
4	133	1.034+01	4.579-02	1.311+10	3.320-03	4.108-03	5.977-03	8.896-03	1.249-02	1.642-02
4	134	1.039+01	5.896-04	1.022+08	3.298-03	1.893-03	1.022-03	5.896-04	3.937-04	3.259-04
4	135	1.044+01	0.000+00	0.000+00	6.080-04	3.502-04	1.824-04	9.180-05	4.531-05	2.237-05
4	136	1.065+01	0.000+00	4.690+04	7.085-04	3.870-04	2.533-04	1.948-04	1.699-04	1.623-04
4	137	1.066+01	0.000+00	5.642+05	8.238-04	9.440-04	1.130-03	1.341-03	1.529-03	1.695-03
4	138	1.066+01	0.000+00	5.650+05	9.416-04	7.694-04	7.658-04	8.314-04	9.085-04	9.881-04
4	139	1.066+01	0.000+00	3.483+05	1.497-03	1.226-03	1.218-03	1.317-03	1.435-03	1.556-03
4	140	1.069+01	0.000+00	1.751+06	4.851-03	3.843-03	3.733-03	4.000-03	4.348-03	4.725-03
4	141	1.070+01	0.000+00	5.834+06	9.792-03	1.142-02	1.383-02	1.655-02	1.896-02	2.112-02
4	142	1.071+01	0.000+00	6.220+06	1.300-02	1.495-02	1.802-02	2.155-02	2.472-02	2.756-02
4	143	1.072+01	0.000+00	4.064+06	5.694-03	6.046-03	7.019-03	8.239-03	9.359-03	1.039-02
4	144	1.073+01	0.000+00	0.000+00	1.029-04	5.798-05	3.155-05	1.685-05	9.036-06	4.975-06
4	145	1.073+01	0.000+00	6.150+06	4.160-03	4.870-03	5.908-03	7.084-03	8.125-03	9.071-03
4	146	1.074+01	0.000+00	6.900+06	1.528-03	1.798-03	2.184-03	2.622-03	3.009-03	3.361-03
4	147	1.075+01	0.000+00	0.000+00	5.835-03	2.934-03	1.557-03	8.325-04	4.370-04	2.294-04
4	148	1.077+01	0.000+00	0.000+00	1.320-05	9.626-06	8.031-06	7.527-06	7.449-06	7.535-06
4	149	1.077+01	0.000+00	0.000+00	3.371-05	2.257-05	1.780-05	1.665-05	1.706-05	1.787-05
4	150	1.077+01	5.658-05	7.533+06	8.809-05	6.379-05	5.479-05	5.507-05	5.923-05	6.385-05
4	151	1.078+01	0.000+00	0.000+00	1.288-04	1.088-04	1.011-04	9.995-05	1.016-04	1.043-04

Table II. Ca IX Oscillator Strengths, Radiative Decay Rates, and Collision Strengths for transitions involving the lowest 4 levels.

Low. Lev.	Upp. Lev.		Osc. Str.	Rad. Dec. Rate	Collision Strength Impact Electron Energy - Eo (Ry)				
i	j	Eo	gf	(1/s)	E	5.8	13.6	24.2	38.6	57.9
4	152	1.078+01	0.000+00	0.000+00	9.199-04	7.851-04	7.225-04	7.058-04	7.113-04	7.260-04
4	153	1.079+01	0.000+00	0.000+00	2.406-03	2.562-03	2.727-03	2.896-03	3.049-03	3.182-03
4	154	1.079+01	0.000+00	0.000+00	1.289-05	6.285-06	3.003-06	1.579-06	9.559-07	6.218-07
4	155	1.080+01	9.396-05	1.258+07	1.161-03	6.831-04	4.099-04	2.647-04	1.945-04	1.637-04
4	156	1.080+01	0.000+00	1.431+04	2.078-03	1.029-03	5.452-04	2.970-04	1.658-04	9.511-05
4	157	1.081+01	0.000+00	0.000+00	1.871-05	1.299-05	1.178-05	1.178-05	1.275-05	1.363-05
4	158	1.081+01	1.713-04	2.295+07	1.637-03	1.695-03	1.777-03	1.876-03	1.977-03	2.071-03
4	159	1.081+01	0.000+00	0.000+00	2.029-03	1.774-03	1.666-03	1.646-03	1.670-03	1.713-03
4	160	1.081+01	0.000+00	0.000+00	7.361-05	4.051-05	2.966-05	2.605-05	2.611-05	2.669-05
4	161	1.081+01	0.000+00	0.000+00	2.175-03	1.733-03	1.510-03	1.421-03	1.404-03	1.420-03
4	162	1.082+01	0.000+00	0.000+00	8.709-04	6.354-04	5.612-04	5.455-04	5.777-04	6.051-04
4	163	1.083+01	0.000+00	0.000+00	7.240-04	5.761-04	5.335-04	5.292-04	5.664-04	5.959-04
4	164	1.084+01	0.000+00	0.000+00	9.110-03	7.570-03	6.843-03	6.602-03	6.610-03	6.728-03
4	165	1.084+01	0.000+00	0.000+00	1.718-02	1.854-02	1.987-02	2.118-02	2.235-02	2.334-02
4	166	1.085+01	0.000+00	0.000+00	5.980-03	6.067-03	6.291-03	6.552-03	7.186-03	7.628-03
4	167	1.085+01	0.000+00	0.000+00	3.555-03	2.397-03	2.015-03	1.904-03	1.988-03	2.068-03
4	168	1.085+01	0.000+00	0.000+00	4.945-03	4.863-03	4.969-03	5.150-03	5.633-03	5.974-03
4	169	1.085+01	0.000+00	0.000+00	2.312-02	2.506-02	2.699-02	2.883-02	3.044-02	3.180-02
4	170	1.086+01	0.000+00	0.000+00	4.352-03	1.871-03	9.529-04	5.814-04	4.253-04	3.611-04
4	171	1.087+01	2.806-04	8.878+07	4.992-05	3.888-05	4.156-05	5.461-05	7.362-05	9.517-05
4	172	1.087+01	1.683-03	2.283+08	1.003-02	9.781-03	9.943-03	1.036-02	1.086-02	1.137-02
4	173	1.088+01	3.118-04	5.929+07	9.243-03	9.975-03	1.073-02	1.146-02	1.212-02	1.269-02
4	174	1.089+01	0.000+00	0.000+00	6.712-03	7.256-03	7.818-03	8.353-03	8.822-03	9.225-03
4	175	1.089+01	0.000+00	3.889+03	2.804-03	2.270-03	2.131-03	2.132-03	2.295-03	2.414-03
4	176	1.089+01	0.000+00	0.000+00	2.281-03	2.030-03	1.990-03	2.024-03	2.198-03	2.320-03
4	177	1.090+01	0.000+00	0.000+00	2.144-03	2.149-03	2.214-03	2.297-03	2.519-03	2.667-03
4	178	1.091+01	0.000+00	0.000+00	2.608-03	1.462-03	1.065-03	9.278-04	9.247-04	9.406-04
4	179	1.091+01	0.000+00	0.000+00	9.493-03	5.247-03	2.806-03	1.471-03	7.733-04	4.163-04
4	180	1.092+01	0.000+00	0.000+00	5.900-04	5.524-04	5.458-04	5.572-04	5.750-04	5.940-04
4	181	1.092+01	0.000+00	0.000+00	6.427-04	6.971-04	7.518-04	8.038-04	8.487-04	8.865-04
4	182	1.092+01	0.000+00	0.000+00	9.646-04	8.614-04	8.253-04	8.266-04	8.443-04	8.674-04
4	183	1.093+01	0.000+00	0.000+00	5.015-03	2.765-03	1.471-03	7.699-04	4.064-04	2.213-04
4	184	1.103+01	3.919-05	1.277+07	4.421-05	3.504-05	3.116-05	3.096-05	3.256-05	3.479-05
4	185	1.103+01	0.000+00	0.000+00	4.680-06	2.399-06	1.175-06	5.987-07	3.260-07	1.834-07
4	186	1.103+01	1.100-04	2.151+07	1.292-04	1.038-04	9.298-05	9.222-05	9.644-05	1.026-04
4	187	1.104+01	0.000+00	0.000+00	2.957-04	1.536-04	7.856-05	4.144-05	2.352-05	1.438-05
4	188	1.106+01	0.000+00	0.000+00	7.288-04	3.902-04	2.012-04	1.003-04	4.893-05	2.300-05
4	189	1.107+01	0.000+00	0.000+00	9.769-05	3.507-05	1.425-05	6.529-06	3.332-06	1.998-06
4	190	1.112+01	0.000+00	0.000+00	1.553-04	8.731-05	6.661-05	6.020-05	6.159-05	6.308-05
4	191	1.112+01	0.000+00	0.000+00	9.434-05	8.700-05	8.486-05	8.537-05	9.226-05	9.542-05
4	192	1.112+01	0.000+00	0.000+00	2.314-04	2.263-04	2.366-04	2.514-04	2.737-04	2.821-04
4	193	1.112+01	0.000+00	0.000+00	1.448-04	1.250-04	1.199-04	1.211-04	1.293-04	1.325-04
4	194	1.112+01	0.000+00	0.000+00	3.881-04	3.149-04	2.964-04	2.963-04	3.192-04	3.338-04
4	195	1.113+01	0.000+00	0.000+00	8.150-04	8.106-04	8.292-04	8.550-04	9.359-04	9.844-04
4	196	1.116+01	0.000+00	0.000+00	2.572-05	1.481-05	8.916-06	5.623-06	4.079-06	3.440-06

Table II. Ca IX Oscillator Strengths, Radiative Decay Rates, and Collision Strengths for transitions involving the lowest 4 levels.

Low. Lev.	Upp. Lev.		Osc. Str.	Rad. Dec. Rate	Collision Strength Impact Electron Energy - Eo (Ry)				
i	j	Eo	gf	(1/s)	E	5.8	13.6	24.2	38.6	57.9
4	197	1.123+01	0.000+00	0.000+00	3.363-05	2.368-05	2.058-05	1.993-05	2.137-05	2.210-05
4	198	1.124+01	0.000+00	0.000+00	7.541-05	5.593-05	4.938-05	4.840-05	5.198-05	5.381-05
4	199	1.124+01	0.000+00	0.000+00	5.366-05	4.436-05	4.144-05	4.162-05	4.515-05	4.689-05
4	200	1.125+01	0.000+00	0.000+00	5.577-06	3.710-06	2.941-06	2.966-06	2.885-06	3.071-06
4	201	1.125+01	0.000+00	0.000+00	1.990-05	1.709-05	1.596-05	1.842-05	1.861-05	2.003-05
4	202	1.125+01	0.000+00	0.000+00	1.237-05	1.068-05	1.024-05	1.198-05	1.240-05	1.353-05
4	203	1.128+01	0.000+00	0.000+00	4.659-05	4.465-05	4.556-05	4.793-05	4.990-05	5.154-05
4	204	1.128+01	0.000+00	0.000+00	2.578-05	2.038-05	1.871-05	1.906-05	2.024-05	2.039-05
4	205	1.128+01	0.000+00	0.000+00	1.004-05	8.156-06	7.754-06	8.010-06	8.618-06	8.725-06
4	206	1.131+01	0.000+00	0.000+00	9.956-05	4.754-05	2.381-05	1.207-05	6.304-06	3.173-06
4	207	1.132+01	0.000+00	0.000+00	3.772-05	1.987-05	9.862-06	4.895-06	2.520-06	1.346-06
4	208	1.142+01	0.000+00	0.000+00	1.248-05	6.906-06	3.884-06	2.245-06	1.359-06	8.611-07
4	209	1.145+01	0.000+00	0.000+00	1.298-04	4.494-05	1.748-05	7.111-06	2.921-06	1.228-06
4	210	1.222+01	0.000+00	0.000+00	3.812-06	3.818-06	4.314-06	5.022-06	5.682-06	6.204-06
4	211	1.222+01	0.000+00	0.000+00	9.577-06	8.306-06	8.154-06	8.546-06	9.133-06	9.786-06
4	212	1.222+01	0.000+00	0.000+00	2.724-05	2.308-05	2.111-05	2.015-05	2.017-05	2.116-05
4	213	1.225+01	0.000+00	0.000+00	2.196-05	1.148-05	5.992-06	3.201-06	1.775-06	9.668-07
4	214	1.248+01	0.000+00	0.000+00	7.030-06	3.850-06	2.490-06	2.051-06	2.240-06	2.758-06
4	215	1.249+01	0.000+00	0.000+00	3.138-06	2.028-06	1.686-06	1.638-06	1.697-06	1.856-06
4	216	1.249+01	0.000+00	0.000+00	8.770-06	5.871-06	5.214-06	5.347-06	5.747-06	6.456-06
4	217	1.249+01	0.000+00	0.000+00	1.719-05	1.059-05	8.554-06	8.178-06	8.403-06	9.207-06
4	218	1.250+01	0.000+00	0.000+00	3.497-06	2.651-06	2.524-06	2.786-06	3.227-06	3.683-06
4	219	1.250+01	0.000+00	0.000+00	9.563-06	8.487-06	9.043-06	1.047-05	1.198-05	1.300-05
4	220	1.251+01	0.000+00	8.207+03	2.215-05	2.215-05	2.520-05	3.013-05	3.495-05	3.785-05
4	221	1.254+01	0.000+00	5.898+03	1.537-05	1.293-05	1.206-05	1.168-05	1.135-05	1.104-05
4	222	1.254+01	0.000+00	1.381+04	3.948-06	3.086-06	2.919-06	2.895-06	2.907-06	2.922-06
4	223	1.254+01	0.000+00	1.975+04	1.203-06	1.083-06	1.128-06	1.170-06	1.202-06	1.226-06
4	224	1.256+01	0.000+00	0.000+00	4.887-05	2.705-05	1.530-05	8.638-06	4.891-06	2.691-06
4	225	1.259+01	0.000+00	0.000+00	1.787-05	9.428-06	5.128-06	2.864-06	1.651-06	9.156-07
4	226	1.282+01	0.000+00	0.000+00	6.549-06	3.633-06	1.973-06	1.086-06	6.354-07	4.135-07
4	227	1.284+01	0.000+00	0.000+00	2.908-06	2.154-06	1.853-06	1.877-06	2.052-06	2.295-06
4	228	1.284+01	0.000+00	0.000+00	6.219-06	4.603-06	4.320-06	4.910-06	5.875-06	7.049-06
4	229	1.284+01	3.963-05	7.497+06	1.231-05	1.130-05	1.392-05	1.899-05	2.491-05	3.152-05
4	230	1.285+01	0.000+00	0.000+00	6.055-06	3.993-06	2.879-06	2.328-06	2.121-06	2.021-06
4	231	1.285+01	0.000+00	0.000+00	1.669-05	1.179-05	9.274-06	8.127-06	7.751-06	7.771-06
4	232	1.285+01	0.000+00	0.000+00	3.499-05	2.713-05	2.367-05	2.258-05	2.276-05	2.369-05
4	233	1.285+01	0.000+00	0.000+00	3.146-06	1.691-06	9.199-07	5.184-07	3.202-07	2.098-07
4	234	1.288+01	2.512-05	1.117+07	4.739-06	4.617-06	6.126-06	8.207-06	9.880-06	1.102-05
4	235	1.289+01	0.000+00	0.000+00	3.672-06	2.322-06	1.610-06	1.273-06	1.143-06	1.127-06
4	236	1.289+01	0.000+00	0.000+00	7.496-06	4.821-06	3.495-06	2.934-06	2.787-06	2.866-06
4	237	1.289+01	0.000+00	0.000+00	1.306-05	8.043-06	5.452-06	4.271-06	3.863-06	3.866-06
4	238	1.295+01	2.382-05	6.414+06	1.691-05	9.889-06	6.398-06	4.845-06	4.396-06	4.565-06
4	239	1.295+01	0.000+00	0.000+00	7.913-07	4.012-07	2.054-07	1.094-07	6.267-08	3.806-08
4	240	1.295+01	1.168-04	5.246+07	7.469-06	7.872-06	9.432-06	1.182-05	1.504-05	1.918-05
4	241	1.295+01	3.376-04	9.097+07	2.211-05	2.326-05	2.776-05	3.472-05	4.405-05	5.607-05

Table II. Ca IX Oscillator Strengths, Radiative Decay Rates, and Collision Strengths for transitions involving the lowest 4 levels.

Low. Lev.	Upp. Lev.		Osc. Str.	Rad. Dec. Rate	Collision Strength Impact Electron Energy - Eo (Ry)				
i	j	Eo	gf	(1/s)	E	5.8	13.6	24.2	38.6	57.9
4	242	1.296+01	0.000+00	0.000+00	2.576-05	1.495-05	8.466-06	4.735-06	2.614-06	1.416-06
4	243	1.298+01	0.000+00	0.000+00	9.307-06	4.674-06	2.384-06	1.321-06	8.178-07	5.764-07
4	244	1.298+01	0.000+00	0.000+00	8.468-06	5.416-06	3.996-06	3.416-06	3.250-06	3.301-06
4	245	1.299+01	0.000+00	0.000+00	1.925-05	1.456-05	1.306-05	1.291-05	1.349-05	1.456-05
4	246	1.299+01	0.000+00	0.000+00	3.752-05	3.304-05	3.381-05	3.601-05	3.912-05	4.318-05
4	247	1.299+01	0.000+00	0.000+00	7.207-06	6.193-06	6.215-06	6.648-06	7.342-06	8.079-06
4	248	1.299+01	0.000+00	0.000+00	1.929-05	1.954-05	2.182-05	2.467-05	2.770-05	3.008-05
4	249	1.299+01	0.000+00	6.319+03	4.844-05	5.886-05	7.192-05	8.445-05	9.620-05	1.046-04
4	250	1.302+01	0.000+00	0.000+00	9.763-06	5.222-06	3.031-06	2.067-06	1.840-06	1.969-06
4	251	1.304+01	0.000+00	0.000+00	3.471-06	1.637-06	7.583-07	3.632-07	2.019-07	1.306-07
4	252	1.304+01	0.000+00	0.000+00	6.906-06	4.891-06	4.239-06	4.155-06	4.308-06	4.644-06
4	253	1.304+01	0.000+00	0.000+00	2.052-06	1.333-06	1.066-06	1.052-06	1.090-06	1.111-06
4	254	1.304+01	0.000+00	0.000+00	1.246-05	9.162-06	8.466-06	8.685-06	9.288-06	1.018-05
4	255	1.304+01	0.000+00	0.000+00	3.283-06	2.226-06	1.953-06	2.095-06	2.264-06	2.355-06
4	256	1.304+01	0.000+00	0.000+00	1.940-05	1.292-05	1.078-05	1.044-05	1.086-05	1.176-05
4	257	1.304+01	0.000+00	0.000+00	5.349-06	3.395-06	2.771-06	2.851-06	3.015-06	3.105-06
4	258	1.304+01	0.000+00	0.000+00	1.333-06	7.775-07	6.074-07	6.167-07	6.741-07	6.992-07
4	259	1.305+01	0.000+00	0.000+00	2.559-06	1.448-06	1.104-06	1.116-06	1.221-06	1.283-06
4	260	1.305+01	0.000+00	0.000+00	3.994-06	2.207-06	1.674-06	1.722-06	1.975-06	2.124-06
4	261	1.306+01	0.000+00	0.000+00	1.819-06	7.345-07	2.995-07	1.327-07	6.747-08	4.304-08
4	262	1.306+01	0.000+00	1.883+04	3.887-06	3.165-06	3.200-06	3.604-06	4.195-06	4.792-06
4	263	1.306+01	0.000+00	4.395+04	9.702-06	1.097-05	1.323-05	1.606-05	1.912-05	2.190-05
4	264	1.306+01	0.000+00	5.006+04	1.883-05	2.250-05	2.762-05	3.358-05	3.974-05	4.512-05
4	265	1.306+01	0.000+00	0.000+00	6.047-06	3.528-06	2.117-06	1.349-06	9.597-07	7.355-07
4	266	1.306+01	0.000+00	0.000+00	3.098-06	1.901-06	1.411-06	1.302-06	1.293-06	1.307-06
4	267	1.306+01	0.000+00	0.000+00	9.853-07	6.757-07	6.515-07	7.042-07	7.846-07	8.013-07
4	268	1.306+01	0.000+00	0.000+00	1.540-06	1.385-06	1.555-06	1.803-06	2.065-06	2.123-06
4	269	1.306+01	0.000+00	0.000+00	3.577-06	2.523-06	2.232-06	2.250-06	2.413-06	2.408-06
4	270	1.306+01	0.000+00	0.000+00	6.530-06	4.557-06	3.961-06	4.135-06	4.383-06	4.531-06
4	271	1.306+01	0.000+00	0.000+00	1.226-05	9.460-06	9.021-06	1.003-05	1.091-05	1.138-05
4	272	1.307+01	0.000+00	0.000+00	2.755-05	3.373-05	4.349-05	5.729-05	7.618-05	9.758-05
4	273	1.307+01	0.000+00	0.000+00	1.481-05	1.868-05	2.310-05	2.715-05	3.086-05	3.325-05
4	274	1.307+01	0.000+00	0.000+00	5.883-06	7.570-06	9.442-06	1.109-05	1.260-05	1.356-05
4	275	1.307+01	0.000+00	0.000+00	3.166-05	1.575-05	7.785-06	3.897-06	1.947-06	9.328-07
4	276	1.308+01	0.000+00	0.000+00	8.282-06	4.040-06	1.918-06	8.605-07	3.901-07	1.746-07
4	277	1.309+01	0.000+00	0.000+00	2.747-06	1.864-06	1.766-06	2.342-06	3.188-06	3.706-06
4	278	1.309+01	0.000+00	0.000+00	2.266-06	1.598-06	1.436-06	1.613-06	1.957-06	2.137-06
4	279	1.309+01	0.000+00	0.000+00	1.712-06	1.236-06	1.120-06	1.198-06	1.389-06	1.472-06
4	280	1.310+01	0.000+00	0.000+00	3.845-06	2.201-06	1.244-06	6.874-07	3.762-07	2.173-07
4	281	1.311+01	0.000+00	0.000+00	4.645-06	2.280-06	1.120-06	5.814-07	3.275-07	1.890-07
4	282	1.314+01	0.000+00	0.000+00	2.776-05	1.547-05	8.330-06	4.508-06	2.383-06	1.203-06
4	283	1.314+01	0.000+00	0.000+00	6.124-06	3.341-06	1.832-06	1.038-06	5.826-07	3.327-07

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
5	6	3.503e-01	6.475e+08	5	7	5.584e-04	5.608e+06	5	9	1.653e-02	3.620e+07
5	10	4.228e-01	9.666e+09	5	11	2.207e-04	1.859e+06	5	12	5.256e-04	2.659e+06
5	14	2.820e+00	2.448e+10	5	15	0.000e+00	5.888e+03	5	18	0.000e+00	2.127e+05
5	19	0.000e+00	1.831e+03	5	25	0.000e+00	1.608e+05	5	26	0.000e+00	6.197e+05
5	27	3.268e-04	2.128e+07	5	28	2.129e-01	4.400e+10	5	30	0.000e+00	2.654e+05
5	33	0.000e+00	1.710e+03	5	35	0.000e+00	2.031e+06	5	37	1.960e-02	1.048e+09
5	40	1.239e-04	6.689e+06	5	41	3.460e-04	1.101e+08	5	42	1.337e-04	1.451e+07
5	43	2.890e-04	1.882e+07	5	45	3.362e-01	2.202e+10	5	53	0.000e+00	1.384e+07
5	54	1.627e-01	2.201e+10	5	55	1.997e-02	2.742e+09	5	56	4.860e-04	4.018e+07
5	58	1.164e-04	4.901e+07	5	59	3.497e-03	4.918e+08	5	60	6.654e-04	9.417e+07
5	61	4.156e-03	3.531e+08	5	62	2.948e-01	2.577e+10	5	63	1.023e-02	4.643e+09
5	64	3.966e-05	6.361e+06	5	65	8.612e-02	4.250e+10	5	66	0.000e+00	8.317e+03
5	67	0.000e+00	2.655e+06	5	68	0.000e+00	3.020e+06	5	69	0.000e+00	3.079e+05
5	70	0.000e+00	6.719e+03	5	72	0.000e+00	2.402e+05	5	73	0.000e+00	1.468e+04
5	74	0.000e+00	7.028e+05	5	75	0.000e+00	1.616e+06	5	77	0.000e+00	5.330e+06
5	78	0.000e+00	3.906e+04	5	79	0.000e+00	1.548e+05	5	81	0.000e+00	7.852e+06
5	86	1.010e-03	1.119e+08	5	90	8.057e-04	9.065e+07	5	92	2.695e-01	3.051e+10
5	95	1.870e-04	2.150e+07	5	97	2.084e-03	2.442e+08	5	101	0.000e+00	6.578e+06
5	109	5.045e-03	6.451e+08	5	112	0.000e+00	1.395e+04	5	124	0.000e+00	3.069e+05
5	125	4.597e-02	1.136e+10	5	126	1.530e-02	3.800e+09	5	127	0.000e+00	6.081e+04
5	128	3.569e-03	5.326e+08	5	129	5.769e-04	4.316e+08	5	130	1.134e-02	2.837e+09
5	132	2.126e-03	3.202e+08	5	133	1.192e-03	3.002e+08	5	134	1.417e-01	2.160e+10
5	135	2.364e-02	1.820e+10	5	136	0.000e+00	5.370e+06	5	137	0.000e+00	1.300e+05
5	138	0.000e+00	7.593e+04	5	139	0.000e+00	2.448e+05	5	140	0.000e+00	2.043e+06
5	141	0.000e+00	3.608e+04	5	143	0.000e+00	3.122e+05	5	145	0.000e+00	4.192e+04
5	147	0.000e+00	6.208e+06	5	154	3.061e-04	8.434e+07	5	156	0.000e+00	6.390e+06
5	159	1.988e-04	3.299e+07	5	163	0.000e+00	4.527e+03	5	173	1.563e-04	2.629e+07
5	180	3.742e-04	6.344e+07	5	183	5.892e-03	1.001e+09	5	186	8.673e-05	1.503e+07
5	187	2.328e-03	4.040e+08	5	196	0.000e+00	2.260e+05	5	206	0.000e+00	2.942e+04
5	207	1.223e-04	1.119e+08	5	208	0.000e+00	1.923e+05	5	213	5.319e-05	1.150e+07
5	225	0.000e+00	1.297e+05	5	233	4.396e-05	1.753e+07	5	238	1.576e-03	3.832e+08
5	241	1.208e-04	2.939e+07	5	275	0.000e+00	7.829e+04	5	281	2.707e-03	3.379e+09
5	283	0.000e+00	9.525e+05	6	15	5.103e-02	3.512e+08	6	16	1.409e-03	7.046e+06
6	18	1.323e+00	9.791e+09	6	19	1.300e-03	1.205e+07	6	20	3.732e-03	5.813e+07
6	22	9.164e-03	1.457e+08	6	23	4.155e-02	3.979e+08	6	24	1.346e-01	9.210e+08
6	25	1.811e+00	1.709e+10	6	26	1.200e-02	2.815e+08	6	28	0.000e+00	6.147e+05
6	30	2.214e-02	1.202e+09	6	35	1.973e-01	1.081e+10	6	36	0.000e+00	8.810e+05
6	37	0.000e+00	3.492e+05	6	41	0.000e+00	5.144e+04	6	45	0.000e+00	5.995e+05
6	47	4.320e-02	3.539e+09	6	48	2.316e-02	1.152e+09	6	52	4.710e-01	4.031e+10
6	53	7.215e-01	2.724e+10	6	54	0.000e+00	4.266e+06	6	55	0.000e+00	2.879e+05
6	56	0.000e+00	1.283e+05	6	57	0.000e+00	9.811e+04	6	58	0.000e+00	2.620e+05
6	60	0.000e+00	6.899e+04	6	62	0.000e+00	2.038e+06	6	63	0.000e+00	6.425e+06
6	65	0.000e+00	1.160e+05	6	66	1.202e-03	1.524e+08	6	67	6.180e-02	4.702e+09
6	68	1.179e-01	8.990e+09	6	69	1.574e-01	8.583e+09	6	70	1.092e-02	1.402e+09

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
6	73	2.097e-02	2.700e+09	6	74	2.241e-02	1.735e+09	6	75	1.514e-01	8.379e+09
6	77	6.214e-01	3.467e+10	6	78	3.037e-03	2.429e+08	6	79	2.869e-03	3.832e+08
6	81	3.627e-03	4.918e+08	6	82	0.000e+00	2.935e+06	6	83	0.000e+00	5.877e+05
6	84	0.000e+00	5.274e+06	6	87	0.000e+00	1.133e+06	6	88	0.000e+00	1.421e+06
6	89	0.000e+00	7.721e+04	6	90	0.000e+00	3.064e+05	6	91	0.000e+00	6.756e+04
6	92	0.000e+00	9.402e+05	6	93	0.000e+00	2.098e+07	6	94	0.000e+00	8.740e+04
6	95	0.000e+00	2.258e+05	6	96	0.000e+00	8.091e+04	6	97	0.000e+00	8.899e+05
6	101	2.740e-01	1.785e+10	6	105	0.000e+00	4.350e+06	6	111	4.501e-02	8.234e+09
6	112	1.816e-02	2.008e+09	6	113	1.963e-02	2.173e+09	6	114	1.063e-01	1.968e+10
6	115	1.957e-03	3.635e+08	6	116	5.255e-05	5.861e+06	6	117	2.039e-04	1.626e+07
6	118	2.578e-04	2.887e+07	6	123	5.501e-04	6.307e+07	6	124	6.177e-02	5.092e+09
6	125	0.000e+00	3.182e+06	6	126	0.000e+00	8.730e+05	6	127	4.705e-04	9.233e+07
6	128	0.000e+00	2.398e+05	6	129	0.000e+00	5.421e+05	6	130	0.000e+00	2.906e+05
6	131	0.000e+00	8.761e+04	6	133	0.000e+00	1.313e+05	6	134	0.000e+00	2.531e+06
6	135	0.000e+00	7.277e+06	6	136	7.684e-02	9.845e+09	6	137	2.022e-04	2.595e+07
6	138	6.989e-05	1.497e+07	6	139	6.383e-02	5.862e+09	6	140	3.279e-02	4.240e+09
6	141	1.364e-03	1.262e+08	6	143	7.879e-04	1.026e+08	6	144	0.000e+00	6.829e+05
6	145	2.938e-03	6.390e+08	6	147	4.046e-01	3.790e+10	6	148	0.000e+00	5.889e+03
6	151	0.000e+00	2.061e+05	6	152	0.000e+00	7.647e+04	6	154	0.000e+00	1.031e+06
6	155	0.000e+00	2.833e+06	6	156	8.952e-03	1.978e+09	6	158	0.000e+00	6.485e+04
6	161	0.000e+00	1.278e+06	6	163	6.936e-04	6.601e+07	6	164	0.000e+00	1.335e+06
6	165	0.000e+00	2.735e+04	6	173	0.000e+00	3.216e+05	6	174	0.000e+00	7.342e+04
6	176	8.597e-04	8.299e+07	6	178	1.063e-03	1.029e+08	6	179	0.000e+00	1.026e+07
6	180	0.000e+00	1.154e+04	6	181	0.000e+00	1.455e+04	6	182	0.000e+00	8.145e+04
6	183	0.000e+00	4.654e+05	6	186	0.000e+00	4.661e+04	6	187	0.000e+00	9.042e+05
6	188	0.000e+00	4.730e+06	6	207	0.000e+00	1.216e+04	6	208	8.202e-05	2.066e+07
6	214	1.626e-02	3.023e+09	6	215	2.005e-05	6.226e+06	6	218	1.824e-04	3.406e+07
6	222	2.717e-05	8.513e+06	6	224	1.047e-02	1.413e+09	6	225	7.897e-03	2.499e+09
6	226	0.000e+00	1.082e+06	6	227	0.000e+00	2.284e+04	6	229	0.000e+00	6.993e+03
6	233	0.000e+00	1.629e+06	6	238	0.000e+00	1.263e+06	6	241	0.000e+00	9.780e+04
6	242	0.000e+00	1.455e+06	6	250	3.479e-04	7.132e+07	6	264	9.811e-05	1.447e+07
6	265	0.000e+00	5.596e+03	6	275	1.045e-03	1.546e+08	6	280	0.000e+00	1.179e+04
6	281	0.000e+00	1.433e+06	7	20	8.239e-01	1.235e+10	7	22	1.321e-01	2.022e+09
7	26	1.499e-03	3.410e+07	7	31	0.000e+00	1.165e+04	7	43	0.000e+00	9.615e+03
7	47	1.724e-01	1.389e+10	7	52	2.408e-03	2.028e+08	7	56	0.000e+00	1.420e+06
7	61	0.000e+00	2.735e+05	7	66	2.660e-01	3.328e+10	7	73	1.189e-02	1.510e+09
7	79	3.553e-02	4.684e+09	7	81	1.017e-03	1.361e+08	7	86	0.000e+00	1.264e+07
7	90	0.000e+00	1.063e+06	7	92	0.000e+00	4.837e+04	7	95	0.000e+00	1.840e+06
7	97	0.000e+00	3.048e+04	7	107	0.000e+00	1.603e+04	7	111	3.028e-02	5.477e+09
7	114	5.084e-03	9.305e+08	7	115	3.071e-05	5.644e+06	7	122	3.898e-03	7.364e+08
7	127	2.347e-04	4.557e+07	7	128	0.000e+00	1.412e+06	7	132	0.000e+00	8.212e+04
7	134	0.000e+00	2.530e+04	7	138	1.518e-01	3.218e+10	7	145	1.485e-02	3.198e+09
7	156	1.206e-03	2.637e+08	7	159	0.000e+00	5.893e+06	7	173	0.000e+00	1.050e+06
7	180	0.000e+00	5.494e+04	7	183	0.000e+00	1.862e+05	7	186	0.000e+00	4.761e+03

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
7	215	1.708e-04	5.258e+07	7	228	0.000e+00	6.335e+03	7	262	4.595e-04	1.569e+08
7	273	1.048e-04	3.587e+07	8	15	7.920e-04	5.123e+06	8	18	3.684e-03	2.568e+07
8	19	1.091e+00	9.589e+09	8	20	8.877e-03	1.311e+08	8	21	2.513e-01	1.128e+10
8	22	7.087e-01	1.069e+10	8	23	7.930e-01	7.204e+09	8	26	2.479e-04	5.568e+06
8	29	1.419e-05	2.243e+06	8	31	0.000e+00	1.127e+04	8	32	0.000e+00	1.649e+04
8	42	0.000e+00	2.431e+04	8	44	0.000e+00	7.934e+03	8	46	1.780e-01	4.258e+10
8	47	1.289e-01	1.032e+10	8	48	2.185e-01	1.062e+10	8	52	3.327e-03	2.784e+08
8	54	0.000e+00	2.912e+05	8	55	0.000e+00	2.766e+06	8	56	0.000e+00	4.199e+05
8	57	0.000e+00	1.306e+06	8	59	0.000e+00	2.089e+05	8	60	0.000e+00	1.202e+05
8	61	0.000e+00	7.848e+05	8	62	0.000e+00	2.215e+04	8	66	1.430e-01	1.780e+10
8	67	3.600e-01	2.689e+10	8	68	2.206e-01	1.652e+10	8	70	4.477e-02	5.644e+09
8	71	1.789e-02	6.767e+09	8	74	3.199e-02	2.431e+09	8	78	3.272e-02	2.571e+09
8	79	4.778e-02	6.268e+09	8	80	5.103e-02	2.011e+10	8	81	5.466e-05	7.280e+06
8	82	0.000e+00	1.117e+05	8	84	0.000e+00	2.334e+06	8	86	0.000e+00	8.792e+06
8	87	0.000e+00	1.546e+07	8	89	0.000e+00	6.688e+05	8	90	0.000e+00	1.846e+06
8	91	0.000e+00	5.370e+06	8	92	0.000e+00	1.910e+04	8	94	0.000e+00	1.396e+06
8	95	0.000e+00	1.079e+06	8	96	0.000e+00	6.401e+06	8	97	0.000e+00	1.113e+04
8	106	0.000e+00	4.028e+04	8	108	0.000e+00	1.400e+04	8	110	3.611e-02	1.950e+10
8	111	2.129e-02	3.835e+09	8	112	7.694e-03	8.376e+08	8	113	3.449e-02	3.760e+09
8	114	5.133e-03	9.353e+08	8	116	1.074e-04	1.179e+07	8	121	3.327e-03	1.877e+09
8	122	3.037e-03	5.714e+08	8	123	7.268e-03	8.207e+08	8	125	0.000e+00	6.943e+05
8	126	0.000e+00	2.152e+06	8	128	0.000e+00	5.839e+05	8	130	0.000e+00	5.486e+03
8	131	0.000e+00	1.130e+06	8	132	0.000e+00	5.577e+05	8	133	0.000e+00	6.158e+04
8	134	0.000e+00	5.610e+04	8	136	1.254e-02	1.584e+09	8	137	2.345e-01	2.967e+10
8	138	7.085e-02	1.496e+10	8	140	8.860e-02	1.130e+10	8	143	3.131e-03	4.022e+08
8	145	5.479e-02	1.175e+10	8	146	4.026e-02	2.594e+10	8	151	0.000e+00	7.826e+04
8	155	0.000e+00	2.785e+05	8	156	2.033e-04	4.428e+07	8	158	0.000e+00	5.818e+06
8	159	0.000e+00	3.424e+06	8	164	0.000e+00	2.050e+06	8	172	0.000e+00	5.663e+05
8	173	0.000e+00	1.605e+06	8	174	0.000e+00	5.652e+06	8	180	0.000e+00	2.378e+05
8	181	0.000e+00	2.343e+05	8	183	0.000e+00	5.365e+04	8	184	0.000e+00	4.939e+03
8	186	0.000e+00	8.554e+03	8	205	4.550e-05	3.298e+07	8	210	0.000e+00	7.003e+03
8	215	1.262e-04	3.872e+07	8	216	3.824e-04	7.041e+07	8	227	0.000e+00	1.459e+04
8	229	0.000e+00	5.671e+03	8	241	0.000e+00	5.364e+03	8	262	2.755e-04	9.376e+07
8	263	1.029e-03	2.102e+08	8	272	1.005e-04	2.056e+07	8	273	1.412e-04	4.814e+07
8	274	1.428e-04	1.461e+08	9	15	3.839e-04	2.406e+06	9	16	3.012e-03	1.373e+07
9	18	3.682e-02	2.490e+08	9	19	3.115e-01	2.663e+09	9	20	1.047e-01	1.505e+09
9	22	2.279e-01	3.347e+09	9	23	1.108e+00	9.802e+09	9	24	2.796e+00	1.768e+10
9	25	8.658e-02	7.641e+08	9	26	5.922e-04	1.302e+07	9	28	0.000e+00	2.354e+04
9	30	1.079e-03	5.610e+07	9	32	0.000e+00	7.544e+03	9	34	0.000e+00	2.260e+04
9	35	7.563e-03	3.973e+08	9	36	0.000e+00	3.354e+04	9	37	0.000e+00	1.436e+04
9	42	0.000e+00	7.197e+03	9	43	0.000e+00	1.630e+04	9	44	0.000e+00	1.595e+04
9	45	0.000e+00	2.278e+04	9	47	1.900e-01	1.503e+10	9	48	6.408e-01	3.079e+10
9	52	4.558e-02	3.771e+09	9	53	3.273e-02	1.195e+09	9	55	0.000e+00	8.465e+05
9	56	0.000e+00	1.876e+06	9	57	0.000e+00	2.485e+06	9	58	0.000e+00	1.798e+06

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
9	59	0.000e+00	1.300e+06	9	60	0.000e+00	4.073e+05	9	61	0.000e+00	9.913e+05
9	62	0.000e+00	6.169e+04	9	63	0.000e+00	3.873e+05	9	65	0.000e+00	7.734e+03
9	66	5.147e-03	6.347e+08	9	67	5.305e-02	3.925e+09	9	68	4.113e-02	3.052e+09
9	69	7.996e-01	4.240e+10	9	70	2.154e-02	2.690e+09	9	72	1.404e-01	1.053e+10
9	73	7.323e-03	9.170e+08	9	74	5.386e-03	4.056e+08	9	75	2.056e-01	1.107e+10
9	77	3.949e-02	2.144e+09	9	78	2.015e-01	1.569e+10	9	79	6.241e-02	8.113e+09
9	81	2.106e-03	2.779e+08	9	82	0.000e+00	1.591e+04	9	83	0.000e+00	1.470e+06
9	84	0.000e+00	6.716e+05	9	86	0.000e+00	4.987e+05	9	87	0.000e+00	3.090e+06
9	88	0.000e+00	1.891e+07	9	89	0.000e+00	8.531e+06	9	90	0.000e+00	5.009e+06
9	91	0.000e+00	1.711e+06	9	92	0.000e+00	6.118e+04	9	93	0.000e+00	1.737e+06
9	94	0.000e+00	5.092e+06	9	95	0.000e+00	4.503e+06	9	96	0.000e+00	2.031e+06
9	97	0.000e+00	1.510e+05	9	101	1.227e-02	7.791e+08	9	105	0.000e+00	2.153e+05
9	106	0.000e+00	1.201e+04	9	107	0.000e+00	2.750e+04	9	108	0.000e+00	3.035e+04
9	111	2.294e-02	4.101e+09	9	112	3.361e-02	3.630e+09	9	113	8.819e-02	9.542e+09
9	114	2.515e-02	4.548e+09	9	115	8.372e-05	1.520e+07	9	116	1.165e-03	1.270e+08
9	118	4.951e-05	5.420e+06	9	122	5.203e-03	9.714e+08	9	123	2.131e-02	2.388e+09
9	124	2.116e-03	1.705e+08	9	125	0.000e+00	8.541e+04	9	126	0.000e+00	1.018e+05
9	127	1.142e-04	2.192e+07	9	128	0.000e+00	9.351e+05	9	129	0.000e+00	1.628e+06
9	130	0.000e+00	2.009e+06	9	131	0.000e+00	2.099e+06	9	132	0.000e+00	1.537e+06
9	133	0.000e+00	1.808e+05	9	134	0.000e+00	1.190e+05	9	135	0.000e+00	5.928e+05
9	136	6.301e-05	7.902e+06	9	137	2.210e-02	2.778e+09	9	138	1.252e-03	2.624e+08
9	139	2.564e-01	2.305e+10	9	140	1.012e-02	1.281e+09	9	141	2.369e-01	2.145e+10
9	143	2.101e-01	2.680e+10	9	144	0.000e+00	3.881e+04	9	145	5.284e-02	1.125e+10
9	147	4.303e-02	3.947e+09	9	151	0.000e+00	2.098e+04	9	152	0.000e+00	1.203e+05
9	154	0.000e+00	4.490e+04	9	156	1.345e-03	2.909e+08	9	158	0.000e+00	6.982e+05
9	159	0.000e+00	1.021e+05	9	161	0.000e+00	4.474e+06	9	163	4.998e-05	4.658e+06
9	164	0.000e+00	3.673e+05	9	165	0.000e+00	3.854e+06	9	172	0.000e+00	6.602e+06
9	173	0.000e+00	4.341e+06	9	174	0.000e+00	1.766e+06	9	176	5.259e-05	4.972e+06
9	178	5.179e-05	4.914e+06	9	179	0.000e+00	7.119e+05	9	180	0.000e+00	1.941e+05
9	181	0.000e+00	2.948e+05	9	182	0.000e+00	6.518e+05	9	183	0.000e+00	1.263e+05
9	184	0.000e+00	1.548e+04	9	185	0.000e+00	2.021e+04	9	187	0.000e+00	5.510e+04
9	188	0.000e+00	2.356e+05	9	203	1.390e-04	2.001e+07	9	214	7.172e-04	1.310e+08
9	216	1.496e-04	2.739e+07	9	217	7.405e-04	9.687e+07	9	224	4.785e-04	6.342e+07
9	225	3.655e-04	1.136e+08	9	226	0.000e+00	5.302e+04	9	228	0.000e+00	1.043e+04
9	229	0.000e+00	9.121e+03	9	233	0.000e+00	7.099e+04	9	238	0.000e+00	6.831e+04
9	239	0.000e+00	1.365e+04	9	240	0.000e+00	1.007e+04	9	242	0.000e+00	6.609e+04
9	263	2.133e-04	4.333e+07	9	264	1.692e-03	2.455e+08	9	272	6.315e-04	1.285e+08
9	273	1.808e-04	6.130e+07	9	281	0.000e+00	7.018e+04	10	20	5.422e-04	4.692e+06
10	26	1.041e+00	1.534e+10	10	30	8.325e-04	3.370e+07	10	35	8.464e-03	3.464e+08
10	37	0.000e+00	1.132e+04	10	47	5.659e-04	3.663e+07	10	52	1.133e-01	7.707e+09
10	61	0.000e+00	9.134e+03	10	62	0.000e+00	1.197e+06	10	66	3.375e-03	3.550e+08
10	70	1.360e-02	1.450e+09	10	73	6.474e-02	6.922e+09	10	79	2.616e-03	2.912e+08
10	81	2.486e-01	2.814e+10	10	90	0.000e+00	1.105e+04	10	92	0.000e+00	7.581e+05
10	95	0.000e+00	3.544e+04	10	97	0.000e+00	1.233e+07	10	109	0.000e+00	7.525e+04

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
10	111	4.969e-03	7.788e+08	10	114	2.746e-02	4.357e+09	10	115	4.322e-04	6.889e+07
10	122	9.386e-05	1.541e+07	10	127	3.442e-05	5.819e+06	10	128	0.000e+00	2.374e+04
10	132	0.000e+00	1.709e+04	10	134	0.000e+00	1.486e+06	10	138	1.205e-03	2.238e+08
10	145	1.090e-03	2.059e+08	10	156	2.094e-01	4.021e+10	10	159	0.000e+00	9.764e+04
10	173	0.000e+00	1.523e+05	10	180	0.000e+00	3.829e+05	10	183	0.000e+00	6.920e+06
10	186	0.000e+00	9.369e+03	10	187	0.000e+00	1.782e+05	10	208	8.877e-04	1.962e+08
10	225	3.087e-04	8.698e+07	10	238	0.000e+00	3.147e+04	10	280	0.000e+00	2.591e+04
10	283	4.511e-03	1.411e+09	11	15	5.427e-01	1.634e+09	11	18	2.147e-02	7.209e+07
11	19	7.053e-03	3.279e+07	11	20	5.675e-03	4.449e+07	11	21	2.135e-01	5.115e+09
11	22	5.791e-01	4.672e+09	11	23	1.661e-01	8.085e+08	11	26	2.163e-04	2.956e+06
11	27	0.000e+00	1.260e+05	11	29	1.235e-01	1.431e+10	11	30	8.277e-02	3.203e+09
11	31	0.000e+00	4.094e+05	11	32	0.000e+00	1.463e+05	11	33	6.037e-03	1.410e+08
11	35	9.149e-03	3.581e+08	11	38	0.000e+00	4.241e+05	11	40	0.000e+00	8.394e+04
11	42	0.000e+00	3.240e+05	11	43	0.000e+00	3.248e+05	11	44	0.000e+00	2.668e+04
11	46	2.100e-03	3.917e+08	11	47	1.527e-03	9.542e+07	11	49	2.694e+00	1.055e+11
11	55	0.000e+00	2.629e+04	11	56	0.000e+00	2.456e+04	11	59	0.000e+00	2.472e+04
11	64	0.000e+00	1.485e+05	11	66	1.361e-03	1.392e+08	11	67	1.023e-04	6.281e+06
11	68	9.271e-03	5.706e+08	11	70	1.538e-02	1.595e+09	11	71	2.135e-02	6.644e+09
11	72	1.227e-03	7.642e+07	11	73	2.548e-03	2.651e+08	11	74	2.979e-02	1.864e+09
11	78	1.914e-04	1.242e+07	11	79	2.950e-03	3.197e+08	11	80	4.173e-03	1.359e+09
11	81	9.285e-05	1.023e+07	11	82	0.000e+00	2.409e+05	11	84	0.000e+00	1.067e+05
11	87	0.000e+00	3.093e+04	11	89	0.000e+00	1.437e+04	11	90	0.000e+00	1.696e+05
11	91	0.000e+00	1.939e+05	11	94	0.000e+00	2.218e+04	11	95	0.000e+00	2.529e+05
11	96	0.000e+00	2.342e+05	11	98	6.237e-01	4.628e+10	11	102	0.000e+00	4.452e+06
11	110	5.995e-03	2.753e+09	11	111	2.393e-03	3.666e+08	11	112	1.297e-03	1.202e+08
11	113	9.338e-04	8.666e+07	11	114	5.255e-03	8.153e+08	11	115	9.652e-02	1.504e+10
11	116	9.299e-03	8.700e+08	11	118	1.850e-01	1.739e+10	11	121	3.468e-02	1.671e+10
11	122	2.815e-02	4.521e+09	11	123	2.076e-03	2.002e+08	11	126	0.000e+00	9.438e+04
11	128	0.000e+00	4.363e+04	11	130	0.000e+00	1.097e+05	11	132	0.000e+00	2.454e+04
11	133	0.000e+00	5.031e+04	11	136	8.163e-04	8.882e+07	11	137	6.515e-04	7.104e+07
11	138	8.551e-05	1.556e+07	11	140	1.620e-03	1.780e+08	11	145	4.043e-04	7.480e+07
11	146	5.745e-04	3.193e+08	11	148	0.000e+00	2.057e+06	11	149	0.000e+00	2.068e+06
11	150	0.000e+00	2.136e+05	11	151	0.000e+00	3.372e+06	11	154	0.000e+00	1.560e+04
11	155	0.000e+00	7.003e+05	11	158	0.000e+00	2.323e+05	11	159	0.000e+00	6.982e+04
11	164	0.000e+00	2.119e+05	11	171	0.000e+00	1.247e+06	11	174	0.000e+00	4.150e+04
11	177	3.679e-04	4.256e+07	11	180	0.000e+00	3.363e+06	11	181	0.000e+00	1.214e+06
11	183	0.000e+00	1.620e+05	11	184	0.000e+00	2.360e+06	11	186	0.000e+00	4.529e+05
11	187	0.000e+00	1.390e+04	11	191	4.010e-04	4.874e+07	11	214	8.693e-04	1.412e+08
11	215	4.468e-02	1.212e+10	11	216	8.285e-03	1.349e+09	11	218	8.614e-02	1.406e+10
11	221	1.246e-03	2.048e+08	11	222	1.626e-02	4.455e+09	11	223	1.969e-02	1.618e+10
11	227	0.000e+00	2.054e+06	11	228	0.000e+00	2.132e+06	11	229	0.000e+00	2.067e+05
11	230	0.000e+00	4.893e+06	11	233	0.000e+00	3.692e+04	11	234	0.000e+00	1.086e+06
11	235	0.000e+00	4.239e+06	11	236	0.000e+00	1.463e+06	11	238	0.000e+00	6.516e+04
11	240	0.000e+00	3.792e+06	11	241	0.000e+00	6.905e+05	11	258	0.000e+00	6.507e+03

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
11	273	3.532e-05	1.072e+07	11	274	3.830e-05	3.489e+07	11	278	0.000e+00	6.747e+03
11	279	0.000e+00	7.109e+03	12	15	1.170e-01	3.516e+08	12	16	8.433e-01	1.859e+09
12	18	4.062e-03	1.362e+07	12	20	5.988e-01	4.689e+09	12	22	1.508e-02	1.215e+08
12	23	7.992e-01	3.885e+09	12	24	1.801e-01	6.259e+08	12	26	8.271e-04	1.129e+07
12	27	0.000e+00	2.096e+05	12	30	2.492e-01	9.635e+09	12	31	0.000e+00	2.911e+05
12	32	0.000e+00	3.653e+05	12	33	9.083e-02	2.121e+09	12	34	0.000e+00	1.222e+05
12	35	2.721e-02	1.064e+09	12	38	0.000e+00	7.832e+04	12	39	0.000e+00	9.409e+05
12	40	0.000e+00	3.295e+05	12	42	0.000e+00	5.405e+05	12	43	0.000e+00	2.316e+05
12	44	0.000e+00	2.663e+05	12	47	4.545e-03	2.838e+08	12	48	1.528e-03	5.802e+07
12	49	4.987e-01	1.953e+10	12	50	3.994e+00	1.117e+11	12	52	1.532e-04	1.006e+07
12	54	0.000e+00	5.902e+03	12	55	0.000e+00	2.993e+04	12	56	0.000e+00	1.928e+04
12	57	0.000e+00	1.760e+04	12	58	0.000e+00	5.593e+04	12	59	0.000e+00	1.358e+04
12	61	0.000e+00	1.659e+04	12	64	0.000e+00	2.463e+05	12	66	3.811e-03	3.896e+08
12	67	5.910e-04	3.626e+07	12	68	1.075e-04	6.613e+06	12	69	9.582e-03	4.214e+08
12	70	3.291e-02	3.413e+09	12	72	1.811e-02	1.128e+09	12	73	1.076e-02	1.119e+09
12	74	8.819e-03	5.515e+08	12	75	3.072e-02	1.374e+09	12	77	1.711e-02	7.722e+08
12	78	3.517e-03	2.281e+08	12	79	1.078e-02	1.168e+09	12	81	1.065e-04	1.173e+07
12	82	0.000e+00	7.058e+04	12	83	0.000e+00	3.935e+05	12	84	0.000e+00	1.940e+04
12	87	0.000e+00	2.096e+04	12	88	0.000e+00	4.775e+04	12	89	0.000e+00	1.127e+05
12	90	0.000e+00	1.214e+05	12	91	0.000e+00	3.229e+05	12	94	0.000e+00	2.301e+05
12	95	0.000e+00	1.819e+05	12	96	0.000e+00	3.881e+05	12	98	1.153e-01	8.554e+09
12	99	9.235e-01	4.893e+10	12	102	0.000e+00	1.239e+06	12	103	0.000e+00	4.768e+06
12	105	0.000e+00	7.478e+03	12	111	1.349e-02	2.066e+09	12	112	1.652e-03	1.530e+08
12	113	1.374e-03	1.274e+08	12	114	1.774e-03	2.751e+08	12	115	3.912e-02	6.095e+09
12	116	1.795e-01	1.679e+10	12	117	5.089e-03	3.403e+08	12	118	8.572e-03	8.054e+08
12	119	2.671e-01	1.795e+10	12	122	7.364e-02	1.182e+10	12	123	2.812e-02	2.711e+09
12	125	0.000e+00	1.238e+04	12	126	0.000e+00	6.335e+03	12	127	1.987e-04	3.286e+07
12	128	0.000e+00	6.036e+04	12	129	0.000e+00	4.989e+05	12	130	0.000e+00	4.771e+04
12	131	0.000e+00	2.149e+04	12	132	0.000e+00	1.338e+05	12	133	0.000e+00	1.838e+04
12	134	0.000e+00	9.949e+03	12	135	0.000e+00	1.930e+04	12	136	3.429e-05	3.730e+06
12	137	5.730e-04	6.247e+07	12	139	1.561e-03	1.217e+08	12	140	1.637e-04	1.798e+07
12	141	2.681e-03	2.107e+08	12	143	3.627e-04	4.017e+07	12	144	0.000e+00	6.168e+03
12	145	1.224e-03	2.263e+08	12	147	2.413e-04	1.923e+07	12	148	0.000e+00	3.390e+06
12	149	0.000e+00	1.463e+06	12	150	0.000e+00	1.605e+06	12	151	0.000e+00	9.787e+05
12	152	0.000e+00	4.329e+06	12	154	0.000e+00	9.642e+03	12	155	0.000e+00	1.239e+05
12	158	0.000e+00	2.820e+05	12	159	0.000e+00	1.812e+04	12	161	0.000e+00	3.427e+05
12	165	0.000e+00	2.495e+05	12	171	0.000e+00	2.088e+06	12	173	0.000e+00	1.217e+05
12	174	0.000e+00	6.826e+04	12	176	2.986e-04	2.458e+07	12	177	6.496e-05	7.512e+06
12	178	2.159e-04	1.785e+07	12	179	0.000e+00	1.232e+04	12	180	0.000e+00	2.275e+06
12	181	0.000e+00	3.133e+06	12	182	0.000e+00	9.879e+05	12	183	0.000e+00	1.631e+05
12	184	0.000e+00	4.386e+05	12	185	0.000e+00	5.322e+06	12	186	0.000e+00	1.778e+06
12	187	0.000e+00	8.057e+04	12	191	7.187e-05	8.734e+06	12	193	5.922e-04	5.142e+07
12	214	7.659e-04	1.244e+08	12	215	1.745e-02	4.734e+09	12	216	7.469e-02	1.216e+10
12	217	6.140e-03	7.145e+08	12	218	8.503e-03	1.388e+09	12	219	1.274e-01	1.486e+10

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
12	221	1.734e-02	2.850e+09	12	222	4.300e-02	1.178e+10	12	225	1.685e-04	4.667e+07
12	226	0.000e+00	2.107e+04	12	227	0.000e+00	3.352e+06	12	228	0.000e+00	1.446e+06
12	229	0.000e+00	1.684e+06	12	230	0.000e+00	1.335e+06	12	231	0.000e+00	5.307e+06
12	233	0.000e+00	1.965e+04	12	234	0.000e+00	1.768e+06	12	235	0.000e+00	3.120e+06
12	236	0.000e+00	3.818e+06	12	237	0.000e+00	1.214e+06	12	238	0.000e+00	1.815e+05
12	239	0.000e+00	8.654e+06	12	240	0.000e+00	7.024e+05	12	241	0.000e+00	2.810e+06
12	259	0.000e+00	6.572e+03	12	273	8.000e-05	2.428e+07	12	277	0.000e+00	5.772e+03
12	278	0.000e+00	5.319e+03	12	279	0.000e+00	1.177e+04	13	15	3.311e-03	9.932e+06
13	16	1.330e-01	2.925e+08	13	17	1.276e+00	2.253e+09	13	18	4.505e-03	1.507e+07
13	19	1.013e+00	4.695e+09	13	23	4.736e-03	2.298e+07	13	24	1.143e+00	3.966e+09
13	25	1.686e-03	9.066e+06	13	27	0.000e+00	2.930e+05	13	31	0.000e+00	2.934e+04
13	32	0.000e+00	2.187e+05	13	33	5.103e-01	1.190e+10	13	34	0.000e+00	6.096e+05
13	37	0.000e+00	2.769e+03	13	38	0.000e+00	4.382e+05	13	40	0.000e+00	5.235e+05
13	42	0.000e+00	6.187e+04	13	43	0.000e+00	3.719e+05	13	44	0.000e+00	6.379e+05
13	48	8.601e-03	3.264e+08	13	49	1.424e-02	5.573e+08	13	50	4.992e-01	1.395e+10
13	51	5.780e+00	1.257e+11	13	56	0.000e+00	2.045e+04	13	57	0.000e+00	4.174e+04
13	59	0.000e+00	8.269e+03	13	60	0.000e+00	2.853e+04	13	61	0.000e+00	3.694e+04
13	64	0.000e+00	3.435e+05	13	67	7.598e-03	4.659e+08	13	68	3.591e-04	2.208e+07
13	69	3.985e-03	1.752e+08	13	72	7.432e-02	4.626e+09	13	74	6.341e-04	3.963e+07
13	75	1.026e-02	4.586e+08	13	76	8.101e-02	2.838e+09	13	77	1.796e-03	8.100e+07
13	78	2.486e-02	1.612e+09	13	83	0.000e+00	7.535e+04	13	85	0.000e+00	5.854e+05
13	89	0.000e+00	2.829e+05	13	90	0.000e+00	1.934e+05	13	91	0.000e+00	3.687e+04
13	94	0.000e+00	5.474e+05	13	95	0.000e+00	2.870e+05	13	96	0.000e+00	4.422e+04
13	98	3.286e-03	2.436e+08	13	99	1.152e-01	6.103e+09	13	100	1.334e+00	5.494e+10
13	102	0.000e+00	8.257e+04	13	103	0.000e+00	9.549e+05	13	104	0.000e+00	5.687e+06
13	112	1.135e-02	1.050e+09	13	113	3.447e-02	3.197e+09	13	116	3.736e-02	3.493e+09
13	117	3.110e-01	2.079e+10	13	118	8.323e-05	7.816e+06	13	119	2.941e-03	1.976e+08
13	120	3.390e-01	1.775e+10	13	123	1.312e-01	1.264e+10	13	124	3.744e-04	2.595e+07
13	125	0.000e+00	8.072e+03	13	126	0.000e+00	3.235e+04	13	130	0.000e+00	2.055e+05
13	131	0.000e+00	5.067e+04	13	132	0.000e+00	3.257e+05	13	133	0.000e+00	1.565e+04
13	134	0.000e+00	5.160e+03	13	136	1.195e-04	1.300e+07	13	137	4.989e-05	5.436e+06
13	139	4.955e-04	3.863e+07	13	140	2.614e-05	2.871e+06	13	141	1.794e-04	1.410e+07
13	142	6.471e-03	3.964e+08	13	143	2.148e-03	2.378e+08	13	148	0.000e+00	3.885e+05
13	149	0.000e+00	2.323e+06	13	150	0.000e+00	3.997e+06	13	151	0.000e+00	3.042e+04
13	152	0.000e+00	8.011e+05	13	153	0.000e+00	5.593e+06	13	154	0.000e+00	5.599e+03
13	155	0.000e+00	3.304e+04	13	158	0.000e+00	9.733e+03	13	161	0.000e+00	2.477e+05
13	162	1.163e-04	7.330e+06	13	165	0.000e+00	1.476e+04	13	169	0.000e+00	2.434e+05
13	171	0.000e+00	2.842e+06	13	172	0.000e+00	1.716e+05	13	173	0.000e+00	7.197e+04
13	174	0.000e+00	7.985e+03	13	175	7.002e-04	4.479e+07	13	179	0.000e+00	1.245e+05
13	180	0.000e+00	2.164e+05	13	181	0.000e+00	1.826e+06	13	182	0.000e+00	5.079e+06
13	183	0.000e+00	2.153e+04	13	184	0.000e+00	2.519e+06	13	186	0.000e+00	2.882e+06
13	187	0.000e+00	1.037e+05	13	190	4.860e-05	3.279e+06	13	192	7.905e-04	5.336e+07
13	214	7.411e-05	1.203e+07	13	216	2.028e-02	3.301e+09	13	217	1.375e-01	1.599e+10
13	218	6.511e-05	1.062e+07	13	219	5.669e-03	6.611e+08	13	220	1.686e-01	1.530e+10

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
13	221	8.117e-02	1.334e+10	13	224	1.461e-04	1.723e+07	13	226	0.000e+00	9.379e+03
13	227	0.000e+00	3.688e+05	13	228	0.000e+00	2.257e+06	13	229	0.000e+00	3.916e+06
13	230	0.000e+00	6.656e+04	13	231	0.000e+00	9.863e+05	13	232	0.000e+00	6.284e+06
13	233	0.000e+00	1.191e+04	13	234	0.000e+00	2.301e+06	13	235	0.000e+00	3.310e+05
13	236	0.000e+00	2.398e+06	13	237	0.000e+00	6.463e+06	13	238	0.000e+00	3.613e+05
13	240	0.000e+00	4.150e+06	13	241	0.000e+00	4.527e+06	13	260	0.000e+00	7.331e+03
13	264	9.936e-05	1.290e+07	13	272	1.455e-04	2.649e+07	13	277	0.000e+00	1.422e+04
13	278	0.000e+00	8.334e+03	14	15	6.448e-03	6.938e+06	14	16	5.791e-04	4.648e+05
14	18	1.878e-01	2.417e+08	14	20	5.409e-04	1.950e+06	14	25	2.567e+00	7.699e+09
14	26	8.071e-01	6.308e+09	14	28	0.000e+00	2.524e+05	14	30	1.453e-02	4.111e+08
14	35	1.207e-01	3.462e+09	14	36	0.000e+00	2.338e+05	14	37	0.000e+00	5.098e+05
14	40	0.000e+00	2.859e+03	14	41	0.000e+00	8.240e+05	14	45	0.000e+00	2.651e+05
14	47	6.386e-03	3.132e+08	14	52	2.299e-01	1.193e+10	14	53	3.941e+00	9.092e+10
14	54	0.000e+00	5.970e+05	14	55	0.000e+00	7.550e+04	14	59	0.000e+00	1.135e+04
14	61	0.000e+00	5.546e+03	14	62	0.000e+00	2.988e+05	14	63	0.000e+00	2.393e+05
14	65	0.000e+00	5.838e+05	14	66	1.410e-03	1.197e+08	14	67	3.721e-02	1.895e+09
14	68	3.815e-02	1.949e+09	14	69	2.015e-02	7.357e+08	14	70	7.332e-03	6.319e+08
14	72	2.929e-03	1.516e+08	14	73	3.119e-02	2.696e+09	14	74	7.648e-03	3.978e+08
14	75	1.042e-01	3.874e+09	14	77	3.023e-01	1.136e+10	14	78	5.890e-04	3.188e+07
14	79	2.335e-04	2.111e+07	14	81	7.240e-03	6.667e+08	14	82	0.000e+00	4.570e+05
14	83	0.000e+00	1.251e+04	14	84	0.000e+00	9.864e+05	14	87	0.000e+00	7.602e+04
14	89	0.000e+00	1.945e+04	14	92	0.000e+00	1.883e+05	14	93	0.000e+00	2.761e+05
14	97	0.000e+00	7.409e+05	14	101	9.662e-01	4.377e+10	14	103	0.000e+00	1.371e+04
14	105	0.000e+00	8.667e+06	14	111	1.720e-03	2.266e+08	14	112	2.051e-01	1.635e+10
14	113	4.928e-02	3.935e+09	14	114	4.694e-03	6.267e+08	14	115	5.663e-04	7.597e+07
14	117	4.470e-04	2.574e+07	14	118	2.389e-03	1.933e+08	14	119	2.333e-04	1.351e+07
14	122	3.608e-04	5.000e+07	14	123	1.246e-04	1.037e+07	14	124	1.774e-01	1.062e+10
14	125	0.000e+00	1.054e+06	14	126	0.000e+00	3.525e+05	14	127	1.490e-01	2.132e+10
14	130	0.000e+00	2.418e+05	14	133	0.000e+00	2.603e+04	14	134	0.000e+00	3.516e+04
14	135	0.000e+00	1.185e+05	14	136	3.581e-02	3.392e+09	14	137	9.337e-04	8.865e+07
14	138	9.645e-05	1.528e+07	14	139	1.702e-02	1.156e+09	14	140	1.196e-02	1.146e+09
14	141	2.859e-03	1.959e+08	14	143	2.117e-03	2.045e+08	14	144	0.000e+00	5.504e+06
14	147	3.068e-01	2.133e+10	14	148	0.000e+00	1.856e+04	14	150	0.000e+00	9.120e+03
14	151	0.000e+00	1.067e+04	14	152	0.000e+00	1.189e+04	14	154	0.000e+00	4.111e+06
14	155	0.000e+00	4.937e+05	14	156	3.717e-04	6.104e+07	14	158	0.000e+00	2.875e+04
14	161	0.000e+00	1.281e+05	14	163	1.823e-03	1.291e+08	14	164	0.000e+00	2.258e+05
14	165	0.000e+00	1.780e+04	14	172	0.000e+00	5.239e+04	14	176	4.908e-03	3.533e+08
14	178	6.929e-03	5.009e+08	14	179	0.000e+00	4.361e+06	14	180	0.000e+00	4.658e+03
14	182	0.000e+00	9.982e+04	14	183	0.000e+00	1.474e+05	14	186	0.000e+00	1.825e+05
14	187	0.000e+00	4.746e+06	14	188	0.000e+00	2.236e+06	14	196	4.196e-03	4.518e+08
14	206	6.368e-04	5.080e+07	14	207	0.000e+00	2.590e+06	14	208	1.346e-04	2.573e+07
14	213	0.000e+00	2.059e+04	14	214	1.030e-01	1.495e+10	14	215	7.410e-05	1.797e+07
14	216	1.652e-04	2.405e+07	14	217	2.544e-04	2.647e+07	14	218	1.174e-03	1.713e+08
14	219	7.221e-05	7.530e+06	14	221	1.899e-04	2.792e+07	14	222	1.349e-04	3.304e+07

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
14	224	1.655e-01	1.746e+10	14	225	4.770e-02	1.182e+10	14	226	0.000e+00	5.165e+06
14	227	0.000e+00	2.636e+04	14	229	0.000e+00	2.068e+04	14	230	0.000e+00	6.044e+03
14	233	0.000e+00	2.534e+06	14	238	0.000e+00	6.908e+06	14	241	0.000e+00	5.237e+05
14	242	0.000e+00	5.688e+06	14	250	4.156e-03	6.738e+08	14	261	0.000e+00	1.947e+04
14	265	0.000e+00	4.062e+03	14	275	5.204e-03	6.096e+08	14	281	0.000e+00	7.987e+06
14	283	8.416e-04	2.332e+08	15	29	0.000e+00	4.049e+03	15	31	9.398e-01	8.995e+09
15	32	8.874e-02	6.072e+08	15	37	6.720e-02	7.452e+08	15	38	1.637e-04	3.086e+06
15	42	3.543e-02	9.859e+08	15	43	6.222e-03	1.039e+08	15	45	5.547e-04	9.363e+06
15	46	0.000e+00	4.711e+05	15	47	0.000e+00	1.637e+05	15	48	0.000e+00	1.133e+04
15	54	8.613e-02	3.626e+09	15	55	2.664e-01	1.152e+10	15	56	6.013e-02	1.570e+09
15	57	1.510e-03	2.857e+07	15	59	8.525e-04	3.846e+07	15	60	9.663e-05	4.408e+06
15	62	1.911e-03	5.504e+07	15	66	0.000e+00	4.262e+05	15	67	0.000e+00	4.890e+04
15	68	0.000e+00	4.034e+05	15	69	0.000e+00	6.936e+04	15	71	0.000e+00	8.168e+04
15	73	0.000e+00	7.080e+03	15	74	0.000e+00	3.357e+05	15	75	0.000e+00	1.259e+05
15	76	0.000e+00	5.832e+03	15	77	0.000e+00	1.326e+04	15	80	0.000e+00	1.391e+04
15	82	3.236e+00	9.673e+10	15	84	4.868e-01	1.471e+10	15	86	2.818e-01	1.205e+10
15	87	3.474e-02	1.065e+09	15	91	2.034e-02	1.489e+09	15	92	4.050e-04	1.795e+07
15	96	8.391e-04	6.362e+07	15	97	2.882e-03	1.349e+08	15	98	0.000e+00	1.857e+04
15	102	3.418e-01	1.187e+10	15	106	2.586e-01	2.251e+10	15	107	5.726e-02	2.992e+09
15	108	1.641e-03	6.128e+07	15	109	1.548e-02	8.307e+08	15	110	0.000e+00	1.365e+06
15	111	0.000e+00	4.094e+05	15	112	0.000e+00	4.655e+04	15	113	0.000e+00	6.596e+03
15	114	0.000e+00	1.012e+05	15	115	0.000e+00	1.198e+06	15	116	0.000e+00	3.779e+05
15	117	0.000e+00	1.460e+04	15	118	0.000e+00	7.897e+05	15	119	0.000e+00	2.324e+05
15	120	0.000e+00	7.778e+03	15	121	0.000e+00	1.998e+06	15	122	0.000e+00	7.387e+05
15	123	0.000e+00	6.713e+04	15	124	0.000e+00	5.612e+04	15	125	3.021e-02	3.380e+09
15	126	2.420e-02	2.728e+09	15	128	8.197e-03	5.555e+08	15	130	3.147e-03	3.585e+08
15	131	2.179e-04	1.065e+07	15	132	7.447e-04	5.117e+07	15	133	4.310e-05	4.956e+06
15	134	2.304e-04	1.611e+07	15	136	0.000e+00	2.351e+05	15	137	0.000e+00	5.222e+05
15	138	0.000e+00	2.742e+05	15	139	0.000e+00	1.421e+05	15	140	0.000e+00	1.656e+05
15	141	0.000e+00	9.816e+04	15	142	0.000e+00	7.495e+03	15	144	8.090e-03	4.475e+08
15	145	0.000e+00	6.254e+04	15	146	0.000e+00	2.940e+05	15	148	1.980e-02	2.583e+09
15	149	2.421e-03	1.896e+08	15	151	3.483e-03	1.953e+08	15	154	1.575e-03	2.068e+08
15	155	5.911e-01	3.334e+10	15	156	0.000e+00	1.447e+04	15	157	0.000e+00	1.233e+07
15	158	3.862e-01	2.183e+10	15	159	3.394e-02	2.688e+09	15	162	0.000e+00	7.115e+04
15	163	0.000e+00	1.848e+06	15	164	3.590e-01	2.047e+10	15	167	0.000e+00	1.314e+06
15	172	8.033e-04	4.623e+07	15	173	9.016e-04	7.281e+07	15	174	2.984e-03	4.026e+08
15	177	0.000e+00	3.055e+05	15	180	1.395e-01	1.139e+10	15	181	9.355e-03	5.460e+08
15	183	6.552e-03	5.367e+08	15	186	5.124e-04	4.318e+07	15	187	6.671e-03	5.634e+08
15	189	0.000e+00	4.899e+05	15	190	0.000e+00	6.766e+06	15	191	0.000e+00	1.827e+06
15	192	0.000e+00	5.965e+05	15	193	0.000e+00	5.049e+05	15	196	0.000e+00	1.786e+05
15	197	0.000e+00	4.872e+06	15	199	0.000e+00	5.517e+05	15	200	0.000e+00	4.533e+05
15	201	0.000e+00	2.233e+04	15	202	0.000e+00	1.326e+05	15	204	0.000e+00	1.449e+04
15	205	0.000e+00	9.016e+04	15	206	0.000e+00	2.547e+05	15	208	0.000e+00	7.977e+04
15	210	6.469e-02	1.231e+10	15	211	1.487e-02	1.699e+09	15	212	4.094e-04	3.342e+07

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
15	213	2.999e-03	3.448e+08	15	214	0.000e+00	1.765e+04	15	215	0.000e+00	8.904e+05
15	216	0.000e+00	3.381e+05	15	217	0.000e+00	2.008e+04	15	218	0.000e+00	8.022e+05
15	219	0.000e+00	2.634e+05	15	220	0.000e+00	9.158e+03	15	221	0.000e+00	1.170e+05
15	222	0.000e+00	1.326e+06	15	223	0.000e+00	3.594e+06	15	224	0.000e+00	6.276e+04
15	225	0.000e+00	3.792e+04	15	226	1.032e-02	9.662e+08	15	227	1.655e-02	3.628e+09
15	228	2.181e-03	2.869e+08	15	229	2.363e-04	2.222e+07	15	230	2.451e-01	2.308e+10
15	233	8.288e-04	1.823e+08	15	235	6.801e-02	9.053e+09	15	236	5.437e-03	5.171e+08
15	238	3.391e-03	4.570e+08	15	241	1.240e-04	1.673e+07	15	243	0.000e+00	4.372e+05
15	244	0.000e+00	6.315e+06	15	247	0.000e+00	1.098e+06	15	248	0.000e+00	2.875e+05
15	249	0.000e+00	8.820e+03	15	250	0.000e+00	8.371e+04	15	252	0.000e+00	2.685e+06
15	254	0.000e+00	3.065e+05	15	262	0.000e+00	3.589e+05	15	263	0.000e+00	1.050e+05
15	273	0.000e+00	2.794e+04	15	274	0.000e+00	1.285e+05	15	275	0.000e+00	1.533e+05
15	283	0.000e+00	8.639e+04	16	30	0.000e+00	2.277e+03	16	31	1.192e-01	1.124e+09
16	32	1.284e+00	8.656e+09	16	34	7.715e-02	4.055e+08	16	36	1.728e-03	1.049e+07
16	37	3.721e-04	4.070e+06	16	40	1.118e-03	1.249e+07	16	43	5.250e-02	8.674e+08
16	44	6.212e-03	7.339e+07	16	45	1.643e-04	2.743e+06	16	47	0.000e+00	3.216e+05
16	48	0.000e+00	8.797e+04	16	52	0.000e+00	8.345e+03	16	56	5.233e-01	1.354e+10
16	57	5.832e-02	1.094e+09	16	61	2.689e-03	7.302e+07	16	62	9.931e-04	2.835e+07
16	66	0.000e+00	1.462e+05	16	67	0.000e+00	2.024e+05	16	68	0.000e+00	1.764e+04
16	69	0.000e+00	3.151e+05	16	70	0.000e+00	1.014e+05	16	74	0.000e+00	3.743e+05
16	75	0.000e+00	1.910e+05	16	76	0.000e+00	1.420e+05	16	77	0.000e+00	1.529e+05
16	79	0.000e+00	1.599e+04	16	82	1.728e-01	5.129e+09	16	83	4.726e+00	1.100e+11
16	84	4.293e-03	1.288e+08	16	86	2.337e-02	9.923e+08	16	87	5.096e-01	1.552e+10
16	88	1.298e-01	3.081e+09	16	89	2.649e-03	8.229e+07	16	90	4.279e-02	1.864e+09
16	93	2.041e-02	5.028e+08	16	94	4.200e-04	1.350e+07	16	95	1.679e-03	7.573e+07
16	98	0.000e+00	8.404e+03	16	99	0.000e+00	1.576e+04	16	102	3.457e-02	1.192e+09
16	103	5.091e-01	1.367e+10	16	105	2.874e-03	7.922e+07	16	107	3.992e-01	2.073e+10
16	108	6.342e-02	2.354e+09	16	109	5.159e-04	2.751e+07	16	111	0.000e+00	8.354e+05
16	112	0.000e+00	6.320e+04	16	113	0.000e+00	1.993e+05	16	114	0.000e+00	1.603e+05
16	115	0.000e+00	7.507e+05	16	116	0.000e+00	1.172e+06	16	117	0.000e+00	2.879e+05
16	118	0.000e+00	8.238e+04	16	119	0.000e+00	6.442e+05	16	120	0.000e+00	1.858e+05
16	122	0.000e+00	1.231e+06	16	123	0.000e+00	4.399e+05	16	127	0.000e+00	8.020e+03
16	128	7.767e-02	5.235e+09	16	131	8.830e-03	4.293e+08	16	132	6.959e-03	4.756e+08
16	134	1.272e-03	8.847e+07	16	136	0.000e+00	1.599e+05	16	138	0.000e+00	4.774e+04
16	139	0.000e+00	5.291e+05	16	140	0.000e+00	4.168e+05	16	141	0.000e+00	2.073e+05
16	142	0.000e+00	1.901e+05	16	143	0.000e+00	1.779e+04	16	144	1.059e-04	5.829e+06
16	145	0.000e+00	2.595e+05	16	147	0.000e+00	4.273e+04	16	149	2.936e-02	2.287e+09
16	150	1.584e-03	8.819e+07	16	151	3.529e-03	1.969e+08	16	152	9.503e-02	4.127e+09
16	155	4.750e-02	2.666e+09	16	157	0.000e+00	6.853e+05	16	159	2.159e-03	1.701e+08
16	160	0.000e+00	8.572e+06	16	161	8.708e-01	3.814e+10	16	162	0.000e+00	7.070e+05
16	163	0.000e+00	3.130e+05	16	164	9.762e-02	5.538e+09	16	165	7.776e-01	3.436e+10
16	167	0.000e+00	2.236e+06	16	168	0.000e+00	4.827e+06	16	170	0.000e+00	1.275e+06
16	173	4.697e-03	3.774e+08	16	175	0.000e+00	1.274e+04	16	176	0.000e+00	3.779e+05
16	177	0.000e+00	1.390e+05	16	178	0.000e+00	8.974e+04	16	179	3.212e-02	1.446e+09

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
16	180	2.034e-02	1.653e+09	16	181	2.145e-01	1.246e+10	16	182	9.917e-03	4.481e+08
16	183	7.900e-04	6.439e+07	16	186	9.373e-05	7.861e+06	16	188	1.264e-03	5.934e+07
16	190	0.000e+00	1.176e+06	16	191	0.000e+00	7.495e+05	16	192	0.000e+00	1.023e+05
16	193	0.000e+00	1.476e+06	16	194	0.000e+00	7.694e+06	16	197	0.000e+00	1.498e+06
16	198	0.000e+00	4.145e+05	16	199	0.000e+00	4.670e+06	16	200	0.000e+00	1.942e+05
16	201	0.000e+00	4.188e+04	16	202	0.000e+00	3.782e+05	16	204	0.000e+00	9.801e+04
16	211	9.898e-02	1.126e+10	16	212	1.591e-02	1.294e+09	16	213	6.243e-04	7.147e+07
16	214	0.000e+00	5.456e+03	16	215	0.000e+00	5.728e+05	16	216	0.000e+00	7.566e+05
16	217	0.000e+00	2.832e+05	16	218	0.000e+00	2.009e+05	16	219	0.000e+00	6.595e+05
16	220	0.000e+00	2.202e+05	16	221	0.000e+00	8.326e+05	16	222	0.000e+00	2.371e+06
16	225	0.000e+00	2.064e+04	16	228	2.418e-02	3.169e+09	16	229	1.454e-03	1.361e+08
16	230	2.171e-02	2.036e+09	16	231	3.386e-01	2.470e+10	16	235	9.065e-03	1.202e+09
16	236	9.477e-02	8.977e+09	16	237	4.162e-03	3.068e+08	16	241	3.555e-05	4.777e+06
16	242	4.004e-04	2.994e+07	16	243	0.000e+00	7.797e+03	16	244	0.000e+00	8.939e+05
16	245	0.000e+00	6.951e+06	16	247	0.000e+00	4.453e+05	16	248	0.000e+00	8.870e+05
16	249	0.000e+00	1.983e+05	16	252	0.000e+00	8.180e+05	16	254	0.000e+00	2.548e+06
16	256	0.000e+00	2.232e+05	16	262	0.000e+00	1.415e+05	16	263	0.000e+00	2.975e+05
16	264	0.000e+00	4.965e+04	16	273	0.000e+00	1.239e+05	17	32	1.177e-01	7.790e+08
17	33	0.000e+00	3.027e+03	17	34	1.769e+00	9.128e+09	17	44	7.279e-02	8.481e+08
17	48	0.000e+00	3.681e+05	17	57	7.532e-01	1.397e+10	17	67	0.000e+00	2.954e+04
17	68	0.000e+00	3.218e+04	17	69	0.000e+00	2.592e+05	17	72	0.000e+00	1.151e+05
17	74	0.000e+00	3.628e+04	17	75	0.000e+00	3.690e+05	17	76	0.000e+00	7.331e+05
17	77	0.000e+00	4.433e+04	17	78	0.000e+00	1.780e+04	17	82	7.615e-04	2.241e+07
17	83	1.064e-01	2.454e+09	17	85	6.198e+00	1.180e+11	17	87	2.344e-02	7.078e+08
17	88	7.750e-01	1.824e+10	17	89	6.863e-02	2.114e+09	17	93	7.476e-04	1.826e+07
17	94	1.697e-03	5.412e+07	17	100	0.000e+00	2.294e+04	17	102	6.277e-04	2.148e+07
17	103	3.857e-02	1.027e+09	17	104	7.359e-01	1.605e+10	17	108	6.013e-01	2.215e+10
17	112	0.000e+00	3.167e+05	17	113	0.000e+00	1.155e+06	17	116	0.000e+00	3.930e+05
17	117	0.000e+00	1.730e+06	17	119	0.000e+00	2.133e+04	17	120	0.000e+00	6.901e+05
17	123	0.000e+00	1.323e+06	17	131	1.226e-01	5.919e+09	17	140	0.000e+00	3.540e+04
17	141	0.000e+00	5.084e+05	17	142	0.000e+00	1.008e+06	17	143	0.000e+00	3.045e+05
17	150	3.936e-02	2.177e+09	17	151	6.225e-05	3.451e+06	17	152	1.451e-02	6.260e+08
17	153	3.114e-01	1.101e+10	17	155	1.754e-04	9.779e+06	17	160	0.000e+00	1.928e+04
17	161	6.463e-04	2.813e+07	17	162	0.000e+00	5.100e+04	17	163	0.000e+00	7.255e+03
17	164	2.774e-03	1.564e+08	17	165	1.470e-01	6.453e+09	17	166	0.000e+00	1.658e+07
17	167	0.000e+00	2.656e+05	17	168	0.000e+00	3.635e+06	17	169	1.994e+00	7.180e+10
17	170	0.000e+00	1.624e+05	17	172	8.375e-03	4.765e+08	17	175	0.000e+00	5.486e+05
17	176	0.000e+00	8.000e+04	17	177	0.000e+00	6.552e+03	17	178	0.000e+00	4.174e+04
17	179	9.989e-03	4.469e+08	17	181	2.204e-02	1.272e+09	17	182	3.021e-01	1.356e+10
17	190	0.000e+00	2.909e+04	17	191	0.000e+00	3.172e+04	17	192	0.000e+00	1.941e+06
17	193	0.000e+00	5.245e+05	17	194	0.000e+00	7.246e+05	17	195	0.000e+00	7.803e+06
17	197	0.000e+00	6.038e+04	17	198	0.000e+00	5.621e+06	17	199	0.000e+00	1.129e+06
17	201	0.000e+00	4.591e+05	17	202	0.000e+00	1.195e+05	17	203	0.000e+00	6.794e+04
17	212	1.492e-01	1.206e+10	17	216	0.000e+00	4.328e+05	17	217	0.000e+00	1.319e+06

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
17	219	0.000e+00	1.074e+05	17	220	0.000e+00	8.349e+05	17	221	0.000e+00	2.757e+06
17	226	9.167e-05	8.509e+06	17	229	3.250e-02	3.028e+09	17	230	2.443e-04	2.280e+07
17	231	2.137e-02	1.552e+09	17	232	4.434e-01	2.635e+10	17	236	9.278e-03	8.746e+08
17	237	1.318e-01	9.669e+09	17	244	0.000e+00	3.406e+04	17	245	0.000e+00	7.204e+05
17	246	0.000e+00	7.580e+06	17	247	0.000e+00	1.868e+04	17	248	0.000e+00	3.023e+05
17	249	0.000e+00	1.131e+06	17	252	0.000e+00	4.119e+04	17	254	0.000e+00	6.365e+05
17	256	0.000e+00	3.099e+06	17	263	0.000e+00	7.528e+04	17	264	0.000e+00	3.527e+05
17	272	0.000e+00	1.230e+05	18	31	3.431e-02	3.081e+08	18	32	7.492e-04	4.810e+06
18	37	1.816e+00	1.898e+10	18	38	3.853e-03	6.851e+07	18	40	9.683e-04	1.034e+07
18	42	1.169e-03	3.100e+07	18	45	1.240e-02	1.996e+08	18	46	0.000e+00	2.625e+04
18	52	0.000e+00	3.863e+05	18	54	2.129e-01	8.622e+09	18	55	8.099e-02	3.371e+09
18	56	6.469e-04	1.625e+07	18	59	1.737e-03	7.548e+07	18	60	3.459e-04	1.520e+07
18	61	2.572e-03	6.786e+07	18	62	8.910e-02	2.474e+09	18	67	0.000e+00	1.883e+05
18	68	0.000e+00	5.533e+04	18	69	0.000e+00	1.686e+04	18	70	0.000e+00	3.469e+04
18	71	0.000e+00	3.912e+03	18	72	0.000e+00	8.401e+03	18	73	0.000e+00	1.644e+05
18	74	0.000e+00	8.307e+04	18	75	0.000e+00	7.434e+04	18	77	0.000e+00	3.780e+05
18	79	0.000e+00	4.851e+03	18	81	0.000e+00	2.126e+05	18	82	5.827e-01	1.690e+10
18	84	3.177e+00	9.313e+10	18	86	6.014e-04	2.496e+07	18	87	1.993e-01	5.931e+09
18	89	1.365e-02	4.146e+08	18	90	3.610e-03	1.538e+08	18	91	1.002e-03	7.123e+07
18	92	8.495e-02	3.656e+09	18	94	6.137e-04	1.930e+07	18	95	3.329e-03	1.469e+08
18	96	1.204e-04	8.867e+06	18	97	2.308e-01	1.050e+10	18	101	0.000e+00	3.253e+04
18	102	1.957e-02	6.606e+08	18	106	9.881e-03	8.373e+08	18	107	9.264e-04	4.712e+07
18	108	1.593e-03	5.791e+07	18	109	4.584e-01	2.395e+10	18	110	0.000e+00	6.312e+04
18	111	0.000e+00	6.889e+04	18	112	0.000e+00	1.130e+06	18	113	0.000e+00	3.219e+05
18	114	0.000e+00	6.429e+05	18	115	0.000e+00	1.469e+04	18	116	0.000e+00	1.386e+04
18	119	0.000e+00	1.271e+04	18	120	0.000e+00	8.619e+03	18	121	0.000e+00	6.419e+04
18	122	0.000e+00	1.683e+04	18	123	0.000e+00	9.097e+03	18	124	0.000e+00	1.326e+06
18	125	2.866e-02	3.131e+09	18	126	2.367e-02	2.606e+09	18	127	0.000e+00	6.887e+04
18	128	2.934e-04	1.942e+07	18	130	9.276e-03	1.032e+09	18	133	3.787e-04	4.254e+07
18	134	1.258e-04	8.593e+06	18	136	0.000e+00	2.102e+05	18	137	0.000e+00	7.004e+04
18	138	0.000e+00	6.543e+03	18	140	0.000e+00	1.577e+05	18	143	0.000e+00	7.436e+03
18	144	2.634e-01	1.425e+10	18	145	0.000e+00	8.404e+03	18	146	0.000e+00	2.241e+04
18	147	0.000e+00	5.278e+04	18	148	2.350e-04	2.999e+07	18	149	8.315e-05	6.367e+06
18	150	5.664e-04	3.100e+07	18	151	4.929e-02	2.703e+09	18	154	6.721e-02	8.632e+09
18	155	4.509e-01	2.489e+10	18	156	0.000e+00	1.184e+06	18	157	0.000e+00	2.568e+05
18	158	1.286e-01	7.108e+09	18	159	4.775e-04	3.701e+07	18	162	0.000e+00	4.335e+06
18	163	0.000e+00	4.798e+04	18	164	3.488e-01	1.946e+10	18	167	0.000e+00	4.433e+06
18	171	2.238e-04	2.940e+07	18	172	2.430e-02	1.369e+09	18	173	2.635e-03	2.082e+08
18	174	1.909e-04	2.520e+07	18	175	0.000e+00	3.515e+05	18	176	0.000e+00	1.355e+06
18	177	0.000e+00	1.830e+04	18	178	0.000e+00	1.811e+06	18	180	4.528e-04	3.619e+07
18	183	5.198e-02	4.167e+09	18	184	3.522e-04	4.842e+07	18	186	1.344e-02	1.109e+09
18	187	2.235e-01	1.848e+10	18	189	0.000e+00	5.323e+06	18	190	0.000e+00	3.637e+05
18	191	0.000e+00	2.917e+04	18	192	0.000e+00	4.895e+04	18	196	0.000e+00	6.430e+06
18	197	0.000e+00	1.065e+05	18	200	0.000e+00	4.920e+04	18	201	0.000e+00	2.558e+04

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
18	204	0.000e+00	3.807e+04	18	205	0.000e+00	9.390e+04	18	206	0.000e+00	8.586e+06
18	208	0.000e+00	2.162e+06	18	210	2.424e-03	4.530e+08	18	212	4.353e-04	3.489e+07
18	213	1.010e-01	1.140e+10	18	214	0.000e+00	9.082e+05	18	215	0.000e+00	4.367e+04
18	216	0.000e+00	1.930e+04	18	219	0.000e+00	9.515e+03	18	220	0.000e+00	1.005e+04
18	221	0.000e+00	1.924e+04	18	222	0.000e+00	1.634e+04	18	223	0.000e+00	1.547e+05
18	224	0.000e+00	1.507e+06	18	225	0.000e+00	1.237e+06	18	226	1.973e-01	1.816e+10
18	227	5.655e-05	1.219e+07	18	229	8.689e-05	8.031e+06	18	230	1.261e-02	1.168e+09
18	233	4.714e-02	1.019e+10	18	234	1.249e-04	2.721e+07	18	235	2.387e-03	3.124e+08
18	238	1.025e-01	1.358e+10	18	240	2.205e-04	4.874e+07	18	241	4.889e-03	6.485e+08
18	243	0.000e+00	3.869e+06	18	244	0.000e+00	4.821e+05	18	247	0.000e+00	2.345e+04
18	250	0.000e+00	3.048e+06	18	252	0.000e+00	6.431e+04	18	261	2.232e-04	2.163e+07
18	262	0.000e+00	2.547e+04	18	264	0.000e+00	4.514e+04	18	273	0.000e+00	2.442e+04
18	274	0.000e+00	7.232e+04	18	275	0.000e+00	4.821e+06	18	280	2.031e-04	2.785e+07
18	283	0.000e+00	2.279e+06	19	31	4.004e-02	2.860e+08	19	32	3.732e-01	1.907e+09
19	38	9.379e-01	1.353e+10	19	40	1.083e+00	9.390e+09	19	46	0.000e+00	2.421e+05
19	47	0.000e+00	1.039e+05	19	48	0.000e+00	4.962e+03	19	52	0.000e+00	8.105e+03
19	55	8.528e-03	3.104e+08	19	56	2.237e-02	4.917e+08	19	59	2.631e-01	1.003e+10
19	60	3.245e-02	1.252e+09	19	61	2.563e-02	5.935e+08	19	62	2.223e-03	5.436e+07
19	64	3.658e-03	1.782e+08	19	66	0.000e+00	1.999e+05	19	67	0.000e+00	1.786e+05
19	68	0.000e+00	1.499e+05	19	69	0.000e+00	1.064e+05	19	71	0.000e+00	8.245e+03
19	72	0.000e+00	1.851e+04	19	73	0.000e+00	2.275e+04	19	75	0.000e+00	5.292e+03
19	76	0.000e+00	3.090e+03	19	77	0.000e+00	3.137e+04	19	78	0.000e+00	1.515e+05
19	79	0.000e+00	1.107e+05	19	80	0.000e+00	7.054e+04	19	81	0.000e+00	1.160e+04
19	82	2.320e-03	6.062e+07	19	84	1.825e-01	4.823e+09	19	86	1.395e-01	5.221e+09
19	87	1.271e+00	3.412e+10	19	89	1.424e+00	3.904e+10	19	90	7.004e-02	2.695e+09
19	91	1.445e-03	9.280e+07	19	92	2.750e-03	1.069e+08	19	94	1.378e+00	3.922e+10
19	95	1.135e-01	4.530e+09	19	96	3.822e-03	2.548e+08	19	97	9.133e-03	3.765e+08
19	102	4.522e-04	1.386e+07	19	106	5.191e-03	4.008e+08	19	107	2.407e-03	1.116e+08
19	108	2.961e-01	9.810e+09	19	109	1.808e-03	8.620e+07	19	110	0.000e+00	1.661e+05
19	111	0.000e+00	7.458e+04	19	112	0.000e+00	2.685e+04	19	113	0.000e+00	1.639e+04
19	114	0.000e+00	4.023e+04	19	115	0.000e+00	1.435e+04	19	116	0.000e+00	2.088e+04
19	117	0.000e+00	5.278e+05	19	118	0.000e+00	2.327e+04	19	120	0.000e+00	1.477e+06
19	121	0.000e+00	2.255e+05	19	122	0.000e+00	2.431e+04	19	123	0.000e+00	2.973e+04
19	125	2.017e-04	2.030e+07	19	126	1.689e-02	1.714e+09	19	128	1.130e-02	6.893e+08
19	130	3.034e-02	3.113e+09	19	132	6.663e-04	4.125e+07	19	133	2.872e-02	2.976e+09
19	134	4.184e-04	2.639e+07	19	137	0.000e+00	4.250e+05	19	138	0.000e+00	2.038e+05
19	139	0.000e+00	2.657e+05	19	140	0.000e+00	1.682e+04	19	142	0.000e+00	8.490e+03
19	143	0.000e+00	2.722e+05	19	144	1.399e-03	7.016e+07	19	145	0.000e+00	3.456e+05
19	146	0.000e+00	3.451e+05	19	147	0.000e+00	1.422e+04	19	148	1.913e-02	2.264e+09
19	149	1.466e-01	1.041e+10	19	150	1.178e-01	5.979e+09	19	151	4.624e-03	2.353e+08
19	155	3.492e-02	1.788e+09	19	156	0.000e+00	3.338e+04	19	157	0.000e+00	3.314e+04
19	158	3.323e-01	1.704e+10	19	159	4.142e-02	2.978e+09	19	162	0.000e+00	1.285e+06
19	163	0.000e+00	3.305e+05	19	164	1.148e-01	5.943e+09	19	167	0.000e+00	3.887e+05
19	171	1.190e-01	1.451e+10	19	172	5.152e-01	2.693e+10	19	173	3.174e-02	2.329e+09

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
19	174	1.279e-03	1.568e+08	19	175	0.000e+00	4.207e+06	19	176	0.000e+00	4.611e+05
19	177	0.000e+00	2.434e+05	19	178	0.000e+00	8.172e+05	19	180	9.927e-03	7.369e+08
19	181	6.147e-02	3.261e+09	19	183	3.362e-03	2.504e+08	19	184	1.177e-01	1.505e+10
19	186	1.340e-01	1.028e+10	19	187	1.191e-02	9.155e+08	19	190	0.000e+00	5.550e+04
19	191	0.000e+00	1.313e+06	19	192	0.000e+00	5.085e+05	19	193	0.000e+00	2.956e+06
19	197	0.000e+00	3.350e+05	19	199	0.000e+00	1.722e+06	19	200	0.000e+00	3.854e+06
19	201	0.000e+00	2.783e+06	19	202	0.000e+00	6.959e+06	19	203	0.000e+00	2.464e+06
19	204	0.000e+00	1.024e+07	19	205	0.000e+00	1.574e+07	19	206	0.000e+00	2.169e+04
19	210	1.136e-03	1.995e+08	19	211	2.991e-04	3.152e+07	19	212	8.477e-02	6.385e+09
19	213	3.465e-04	3.676e+07	19	214	0.000e+00	6.088e+03	19	215	0.000e+00	6.331e+04
19	217	0.000e+00	5.352e+05	19	218	0.000e+00	4.479e+03	19	219	0.000e+00	2.164e+04
19	220	0.000e+00	1.537e+06	19	221	0.000e+00	1.861e+05	19	222	0.000e+00	2.430e+05
19	223	0.000e+00	1.707e+05	19	225	0.000e+00	6.064e+03	19	226	2.036e-04	1.769e+07
19	227	1.087e-02	2.211e+09	19	228	8.382e-02	1.023e+10	19	229	6.323e-02	5.516e+09
19	230	2.361e-04	2.063e+07	19	233	4.945e-05	1.009e+07	19	234	9.481e-02	1.950e+10
19	235	5.485e-03	6.778e+08	19	236	4.671e-02	4.124e+09	19	238	3.563e-03	4.460e+08
19	240	6.016e-02	1.256e+10	19	241	8.089e-02	1.013e+10	19	243	0.000e+00	4.836e+03
19	244	0.000e+00	3.056e+03	19	247	0.000e+00	8.658e+05	19	248	0.000e+00	2.130e+06
19	249	0.000e+00	8.769e+05	19	252	0.000e+00	1.480e+05	19	254	0.000e+00	6.153e+05
19	262	0.000e+00	1.337e+06	19	263	0.000e+00	2.138e+06	19	264	0.000e+00	8.700e+05
19	267	4.177e-05	5.363e+06	19	268	3.609e-04	3.310e+07	19	272	0.000e+00	2.459e+06
19	273	0.000e+00	6.269e+06	19	274	0.000e+00	8.719e+06	19	275	0.000e+00	2.402e+04
19	277	1.066e-03	9.845e+07	20	31	4.821e-01	3.412e+09	20	37	4.468e-03	3.749e+07
20	38	6.207e-02	8.879e+08	20	39	6.454e-01	2.770e+10	20	40	3.024e-01	2.599e+09
20	41	8.718e-04	5.527e+07	20	47	0.000e+00	9.876e+04	20	48	0.000e+00	1.116e+04
20	54	7.815e-03	2.747e+08	20	55	1.196e-02	4.330e+08	20	56	1.781e-03	3.894e+07
20	58	8.952e-02	1.015e+10	20	59	3.729e-02	1.414e+09	20	60	5.138e-02	1.972e+09
20	61	1.042e-02	2.401e+08	20	63	2.731e-04	3.566e+07	20	64	1.771e-03	8.587e+07
20	66	0.000e+00	2.882e+05	20	67	0.000e+00	2.418e+04	20	68	0.000e+00	8.135e+03
20	69	0.000e+00	3.824e+04	20	70	0.000e+00	1.289e+04	20	72	0.000e+00	3.577e+04
20	73	0.000e+00	5.358e+03	20	74	0.000e+00	9.210e+04	20	78	0.000e+00	1.457e+05
20	86	1.345e+00	5.014e+10	20	90	5.545e-01	2.125e+10	20	91	5.133e-02	3.283e+09
20	92	7.784e-03	3.015e+08	20	95	7.036e-01	2.797e+10	20	96	8.697e-02	5.774e+09
20	97	1.777e-02	7.294e+08	20	106	1.082e-02	8.327e+08	20	107	1.887e-01	8.715e+09
20	111	0.000e+00	4.050e+04	20	112	0.000e+00	5.387e+03	20	113	0.000e+00	1.595e+04
20	114	0.000e+00	6.831e+03	20	116	0.000e+00	2.923e+05	20	117	0.000e+00	2.206e+04
20	118	0.000e+00	1.658e+04	20	119	0.000e+00	1.275e+06	20	122	0.000e+00	1.610e+05
20	123	0.000e+00	1.848e+04	20	125	7.412e-03	7.438e+08	20	126	8.133e-04	8.229e+07
20	128	9.455e-04	5.751e+07	20	129	1.400e-02	4.277e+09	20	130	9.108e-03	9.316e+08
20	132	7.857e-04	4.849e+07	20	133	1.947e-02	2.011e+09	20	135	2.036e-04	6.501e+07
20	136	0.000e+00	1.268e+05	20	137	0.000e+00	1.832e+04	20	138	0.000e+00	2.029e+05
20	139	0.000e+00	4.721e+04	20	140	0.000e+00	1.104e+05	20	141	0.000e+00	1.781e+04
20	143	0.000e+00	3.638e+05	20	145	0.000e+00	4.755e+04	20	148	1.497e-01	1.766e+10
20	149	2.289e-02	1.621e+09	20	159	4.060e-01	2.910e+10	20	163	0.000e+00	1.567e+06

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
20	171	5.736e-02	6.973e+09	20	173	2.064e-01	1.510e+10	20	174	3.335e-02	4.076e+09
20	176	0.000e+00	9.719e+05	20	177	0.000e+00	1.547e+06	20	178	0.000e+00	1.291e+06
20	180	9.162e-02	6.782e+09	20	183	6.650e-03	4.938e+08	20	184	9.392e-03	1.197e+09
20	185	8.060e-02	3.083e+10	20	186	4.121e-02	3.153e+09	20	187	3.896e-04	2.987e+07
20	191	0.000e+00	4.928e+06	20	197	0.000e+00	3.237e+06	20	200	0.000e+00	1.010e+07
20	201	0.000e+00	1.092e+06	20	202	0.000e+00	2.661e+04	20	203	0.000e+00	2.612e+06
20	204	0.000e+00	3.438e+06	20	207	2.384e-05	9.893e+06	20	210	1.994e-03	3.494e+08
20	211	5.278e-02	5.549e+09	20	214	0.000e+00	6.080e+03	20	215	0.000e+00	2.791e+04
20	216	0.000e+00	3.802e+05	20	217	0.000e+00	5.701e+04	20	219	0.000e+00	1.210e+06
20	221	0.000e+00	1.923e+05	20	222	0.000e+00	1.285e+04	20	227	8.708e-02	1.768e+10
20	228	1.201e-02	1.463e+09	20	233	7.066e-05	1.439e+07	20	234	4.625e-02	9.489e+09
20	235	6.003e-02	7.402e+09	20	238	2.092e-03	2.613e+08	20	239	3.920e-02	2.449e+10
20	240	6.419e-03	1.337e+09	20	241	2.079e-02	2.599e+09	20	247	0.000e+00	3.398e+06
20	248	0.000e+00	1.231e+05	20	252	0.000e+00	1.058e+06	20	262	0.000e+00	3.944e+06
20	264	0.000e+00	3.940e+05	20	267	4.591e-04	5.881e+07	20	272	0.000e+00	2.090e+06
20	273	0.000e+00	1.633e+06	20	278	5.837e-04	7.529e+07	20	281	1.142e-05	7.394e+06
21	38	4.685e-01	6.612e+09	21	48	0.000e+00	2.430e+04	21	55	8.819e-04	3.166e+07
21	59	7.557e-04	2.841e+07	21	60	7.236e-02	2.754e+09	21	64	9.845e-04	4.737e+07
21	67	0.000e+00	2.611e+04	21	68	0.000e+00	2.264e+04	21	72	0.000e+00	3.674e+04
21	74	0.000e+00	3.122e+04	21	78	0.000e+00	7.200e+04	21	91	4.082e-01	2.594e+10
21	96	5.097e-01	3.363e+10	21	106	5.529e-02	4.229e+09	21	113	0.000e+00	2.985e+04
21	116	0.000e+00	4.290e+04	21	118	0.000e+00	6.300e+05	21	126	3.544e-04	3.567e+07
21	130	4.951e-04	5.039e+07	21	133	1.733e-02	1.782e+09	21	137	0.000e+00	5.797e+03
21	140	0.000e+00	6.956e+04	21	143	0.000e+00	2.545e+05	21	148	5.524e-02	6.486e+09
21	154	4.173e-04	4.933e+07	21	171	3.046e-02	3.686e+09	21	174	2.148e-01	2.613e+10
21	177	0.000e+00	3.032e+06	21	184	6.236e-02	7.914e+09	21	191	0.000e+00	9.188e+05
21	202	0.000e+00	3.139e+06	21	203	0.000e+00	2.498e+06	21	210	1.651e-02	2.881e+09
21	214	0.000e+00	4.543e+03	21	216	0.000e+00	3.852e+04	21	218	0.000e+00	6.371e+05
21	221	0.000e+00	9.106e+04	21	227	3.153e-02	6.378e+09	21	233	5.917e-04	1.200e+08
21	234	2.483e-02	5.075e+09	21	240	3.276e-02	6.799e+09	21	247	0.000e+00	1.052e+06
21	263	0.000e+00	1.338e+06	21	272	0.000e+00	1.388e+06	21	279	2.569e-04	5.506e+07
22	31	8.237e-01	5.693e+09	22	37	1.170e-03	9.606e+06	22	38	4.229e-01	5.922e+09
22	39	6.120e-03	2.571e+08	22	40	2.883e-01	2.425e+09	22	41	1.936e-04	1.206e+07
22	47	0.000e+00	1.623e+04	22	48	0.000e+00	6.102e+04	22	54	1.429e-03	4.955e+07
22	55	1.460e-02	5.215e+08	22	56	1.153e-02	2.487e+08	22	58	1.534e-02	1.716e+09
22	59	1.616e-02	6.046e+08	22	60	1.173e-01	4.444e+09	22	61	2.886e-02	6.564e+08
22	62	2.205e-04	5.296e+06	22	63	5.160e-05	6.655e+06	22	64	1.120e-03	5.366e+07
22	67	0.000e+00	4.907e+04	22	68	0.000e+00	1.273e+04	22	69	0.000e+00	2.689e+04
22	70	0.000e+00	5.600e+04	22	72	0.000e+00	1.173e+04	22	73	0.000e+00	1.053e+04
22	74	0.000e+00	8.509e+04	22	75	0.000e+00	9.107e+04	22	77	0.000e+00	1.571e+04
22	78	0.000e+00	1.488e+04	22	79	0.000e+00	2.155e+05	22	86	1.256e+00	4.634e+10
22	90	4.225e-01	1.603e+10	22	91	3.785e-01	2.396e+10	22	92	1.542e-03	5.912e+07
22	95	3.191e-01	1.256e+10	22	96	3.994e-01	2.626e+10	22	106	2.254e-01	1.718e+10
22	112	0.000e+00	3.714e+04	22	113	0.000e+00	1.505e+04	22	114	0.000e+00	1.530e+04

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
22	115	0.000e+00	6.885e+05	22	116	0.000e+00	2.044e+04	22	118	0.000e+00	1.685e+06
22	119	0.000e+00	5.379e+03	22	122	0.000e+00	2.449e+05	22	123	0.000e+00	7.691e+04
22	125	2.270e-03	2.259e+08	22	126	2.661e-03	2.671e+08	22	128	4.081e-03	2.462e+08
22	129	3.247e-03	9.836e+08	22	130	7.545e-03	7.656e+08	22	132	7.116e-03	4.357e+08
22	133	2.518e-02	2.580e+09	22	135	6.279e-05	1.989e+07	22	136	0.000e+00	2.115e+04
22	137	0.000e+00	6.322e+03	22	138	0.000e+00	6.925e+03	22	139	0.000e+00	4.521e+03
22	140	0.000e+00	1.003e+05	22	141	0.000e+00	1.975e+05	22	143	0.000e+00	8.201e+04
22	145	0.000e+00	4.434e+05	22	148	3.125e-02	3.660e+09	22	149	1.497e-01	1.052e+10
22	154	1.029e-04	1.213e+07	22	159	3.260e-01	2.320e+10	22	163	0.000e+00	7.075e+05
22	171	3.381e-02	4.080e+09	22	173	2.464e-01	1.790e+10	22	174	1.782e-01	2.163e+10
22	176	0.000e+00	1.353e+06	22	177	0.000e+00	1.545e+06	22	178	0.000e+00	5.315e+05
22	180	6.720e-02	4.938e+09	22	183	3.820e-03	2.816e+08	22	184	5.272e-02	6.673e+09
22	185	1.544e-03	5.864e+08	22	186	3.616e-02	2.747e+09	22	187	1.760e-03	1.340e+08
22	191	0.000e+00	1.761e+06	22	193	0.000e+00	3.475e+06	22	197	0.000e+00	4.885e+06
22	200	0.000e+00	1.553e+05	22	201	0.000e+00	2.258e+06	22	202	0.000e+00	3.127e+06
22	203	0.000e+00	3.342e+06	22	204	0.000e+00	3.224e+04	22	210	5.879e-02	1.024e+10
22	211	2.574e-04	2.690e+07	22	214	0.000e+00	1.208e+04	22	215	0.000e+00	8.431e+05
22	216	0.000e+00	2.113e+05	22	218	0.000e+00	1.472e+06	22	219	0.000e+00	2.022e+04
22	221	0.000e+00	2.563e+04	22	222	0.000e+00	1.719e+05	22	227	1.831e-02	3.695e+09
22	228	8.906e-02	1.079e+10	22	233	2.125e-04	4.302e+07	22	234	2.740e-02	5.590e+09
22	235	1.010e-01	1.239e+10	22	238	1.307e-03	1.623e+08	22	239	1.918e-03	1.192e+09
22	240	2.341e-02	4.849e+09	22	241	1.768e-02	2.198e+09	22	247	0.000e+00	5.359e+05
22	248	0.000e+00	2.445e+06	22	252	0.000e+00	1.655e+06	22	262	0.000e+00	2.583e+04
22	263	0.000e+00	1.598e+06	22	264	0.000e+00	6.994e+05	22	267	7.139e-04	9.094e+07
22	272	0.000e+00	1.468e+06	22	273	0.000e+00	2.466e+05	22	278	6.609e-05	8.478e+06
22	279	4.658e-04	9.961e+07	23	31	1.740e-01	1.197e+09	23	32	1.584e+00	7.792e+09
23	37	2.787e-03	2.278e+07	23	38	5.757e-02	8.027e+08	23	40	8.150e-01	6.826e+09
23	46	0.000e+00	5.124e+04	23	48	0.000e+00	1.069e+05	23	54	1.325e-03	4.583e+07
23	55	9.069e-03	3.231e+08	23	56	3.419e-02	7.356e+08	23	57	1.850e-02	2.890e+08
23	59	1.836e-02	6.851e+08	23	60	1.119e-01	4.226e+09	23	61	1.382e-01	3.136e+09
23	62	1.101e-03	2.639e+07	23	64	9.596e-04	4.588e+07	23	66	0.000e+00	3.234e+04
23	68	0.000e+00	1.415e+04	23	69	0.000e+00	9.892e+04	23	70	0.000e+00	4.837e+04
23	71	0.000e+00	1.619e+05	23	72	0.000e+00	9.685e+03	23	74	0.000e+00	4.766e+04
23	75	0.000e+00	1.528e+05	23	76	0.000e+00	6.663e+04	23	77	0.000e+00	1.769e+04
23	78	0.000e+00	1.946e+04	23	79	0.000e+00	1.342e+05	23	80	0.000e+00	5.750e+05
23	82	3.007e-02	7.728e+08	23	84	1.901e-01	4.942e+09	23	86	2.127e-01	7.834e+09
23	87	2.203e+00	5.820e+10	23	89	6.201e-01	1.674e+10	23	90	5.691e-01	2.154e+10
23	91	6.191e-02	3.912e+09	23	94	2.895e-01	8.108e+09	23	95	4.022e-01	1.580e+10
23	96	5.694e-02	3.736e+09	23	97	2.154e-03	8.740e+07	23	102	1.380e-03	4.168e+07
23	106	7.166e-02	5.452e+09	23	107	3.325e-01	1.518e+10	23	108	5.705e-04	1.863e+07
23	109	3.036e-04	1.426e+07	23	111	0.000e+00	1.240e+04	23	113	0.000e+00	5.350e+04
23	115	0.000e+00	8.879e+05	23	116	0.000e+00	6.865e+05	23	118	0.000e+00	5.530e+05
23	119	0.000e+00	1.339e+06	23	121	0.000e+00	6.931e+05	23	122	0.000e+00	2.547e+04
23	123	0.000e+00	2.928e+05	23	125	1.742e-03	1.731e+08	23	126	6.056e-03	6.069e+08

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
23	128	9.770e-03	5.886e+08	23	130	2.701e-03	2.737e+08	23	131	9.526e-03	4.142e+08
23	132	3.220e-02	1.968e+09	23	133	2.373e-02	2.429e+09	23	136	0.000e+00	2.678e+04
23	137	0.000e+00	1.814e+04	23	138	0.000e+00	6.642e+03	23	140	0.000e+00	9.357e+04
23	141	0.000e+00	2.635e+05	23	142	0.000e+00	1.528e+05	23	143	0.000e+00	1.551e+04
23	144	1.853e-04	9.185e+06	23	145	0.000e+00	2.638e+05	23	146	0.000e+00	1.029e+06
23	148	2.858e-02	3.342e+09	23	149	1.128e-01	7.917e+09	23	150	1.678e-01	8.413e+09
23	151	1.041e-02	5.233e+08	23	154	9.331e-05	1.099e+07	23	155	1.824e-03	9.228e+07
23	157	0.000e+00	1.099e+05	23	158	3.863e-01	1.958e+10	23	159	4.767e-02	3.387e+09
23	162	0.000e+00	3.749e+05	23	163	0.000e+00	2.070e+05	23	164	2.530e-01	1.295e+10
23	167	0.000e+00	6.656e+05	23	171	2.898e-02	3.493e+09	23	172	3.227e-01	1.668e+10
23	173	2.495e-01	1.809e+10	23	174	2.673e-02	3.239e+09	23	175	0.000e+00	1.551e+06
23	176	0.000e+00	7.190e+05	23	177	0.000e+00	2.290e+05	23	178	0.000e+00	2.779e+05
23	180	6.850e-03	5.026e+08	23	181	1.424e-01	7.467e+09	23	183	4.793e-03	3.529e+08
23	184	4.984e-03	6.300e+08	23	186	9.983e-02	7.572e+09	23	187	4.818e-03	3.663e+08
23	190	0.000e+00	1.268e+05	23	191	0.000e+00	2.650e+06	23	192	0.000e+00	3.156e+06
23	193	0.000e+00	2.816e+06	23	197	0.000e+00	2.122e+06	23	199	0.000e+00	7.392e+06
23	200	0.000e+00	1.370e+06	23	201	0.000e+00	5.021e+06	23	202	0.000e+00	5.171e+04
23	203	0.000e+00	3.199e+06	23	204	0.000e+00	6.816e+05	23	210	1.795e-02	3.123e+09
23	211	8.458e-02	8.829e+09	23	213	3.544e-04	3.724e+07	23	214	0.000e+00	1.210e+04
23	215	0.000e+00	1.241e+06	23	216	0.000e+00	7.509e+05	23	217	0.000e+00	1.335e+05
23	218	0.000e+00	5.064e+05	23	219	0.000e+00	1.149e+06	23	220	0.000e+00	3.971e+03
23	222	0.000e+00	7.450e+04	23	223	0.000e+00	4.130e+05	23	226	4.710e-04	4.055e+07
23	227	1.640e-02	3.306e+09	23	228	6.545e-02	7.918e+09	23	229	9.976e-02	8.624e+09
23	230	2.257e-04	1.954e+07	23	233	8.654e-05	1.750e+07	23	234	2.297e-02	4.682e+09
23	235	2.316e-02	2.837e+09	23	236	1.945e-01	1.702e+10	23	238	2.769e-03	3.435e+08
23	240	6.292e-04	1.302e+08	23	241	4.606e-02	5.719e+09	23	243	0.000e+00	5.255e+03
23	244	0.000e+00	7.464e+03	23	247	0.000e+00	1.167e+06	23	248	0.000e+00	1.151e+06
23	249	0.000e+00	2.221e+06	23	252	0.000e+00	6.064e+05	23	254	0.000e+00	2.367e+06
23	262	0.000e+00	7.670e+05	23	263	0.000e+00	1.210e+05	23	264	0.000e+00	2.057e+06
23	267	1.537e-04	1.956e+07	23	268	1.363e-03	1.239e+08	23	272	0.000e+00	1.176e+06
23	273	0.000e+00	6.829e+05	23	274	0.000e+00	4.097e+05	23	275	0.000e+00	1.734e+04
23	277	4.637e-05	4.243e+06	23	278	6.097e-04	7.812e+07	23	279	1.024e-04	2.187e+07
24	31	5.088e-03	3.498e+07	24	32	2.030e-01	9.978e+08	24	34	2.826e+00	1.083e+10
24	36	1.299e-03	5.888e+06	24	37	6.138e-03	5.015e+07	24	40	7.436e-01	6.224e+09
24	47	0.000e+00	7.601e+04	24	48	0.000e+00	1.155e+05	24	56	1.963e-02	4.221e+08
24	57	1.153e-01	1.801e+09	24	61	3.108e-01	7.048e+09	24	62	3.722e-03	8.916e+07
24	67	0.000e+00	1.292e+04	24	68	0.000e+00	6.043e+04	24	69	0.000e+00	2.007e+05
24	70	0.000e+00	5.858e+04	24	72	0.000e+00	9.686e+04	24	73	0.000e+00	5.439e+03
24	75	0.000e+00	3.211e+03	24	76	0.000e+00	2.239e+05	24	77	0.000e+00	1.841e+04
24	78	0.000e+00	1.785e+05	24	79	0.000e+00	1.500e+05	24	82	1.174e-02	3.016e+08
24	83	3.412e-01	6.877e+09	24	84	5.390e-03	1.401e+08	24	86	4.779e-03	1.760e+08
24	87	2.591e-01	6.841e+09	24	88	4.929e+00	1.015e+11	24	89	5.825e-01	1.571e+10
24	90	5.725e-02	2.167e+09	24	93	2.163e-02	4.634e+08	24	94	2.592e-01	7.255e+09
24	95	3.491e-02	1.371e+09	24	97	3.951e-04	1.603e+07	24	102	2.578e-04	7.782e+06

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
24	103	3.502e-03	8.226e+07	24	107	8.218e-02	3.752e+09	24	108	5.264e-01	1.718e+10
24	115	0.000e+00	1.176e+05	24	116	0.000e+00	6.812e+05	24	117	0.000e+00	1.123e+06
24	118	0.000e+00	1.442e+04	24	119	0.000e+00	2.859e+05	24	120	0.000e+00	1.457e+06
24	122	0.000e+00	4.355e+05	24	123	0.000e+00	4.135e+05	24	128	1.876e-02	1.130e+09
24	131	5.599e-02	2.434e+09	24	132	4.173e-02	2.550e+09	24	134	1.681e-03	1.047e+08
24	136	0.000e+00	2.267e+04	24	139	0.000e+00	1.250e+05	24	141	0.000e+00	3.235e+04
24	142	0.000e+00	4.882e+05	24	143	0.000e+00	2.308e+05	24	144	1.404e-03	6.958e+07
24	145	0.000e+00	2.102e+05	24	149	4.597e-02	3.225e+09	24	150	3.904e-01	1.958e+10
24	151	4.661e-03	2.343e+08	24	152	3.100e-02	1.213e+09	24	155	2.815e-03	1.424e+08
24	157	0.000e+00	3.334e+04	24	158	2.803e-02	1.421e+09	24	159	8.088e-04	5.746e+07
24	160	0.000e+00	6.136e+05	24	161	7.844e-01	3.097e+10	24	162	0.000e+00	9.636e+04
24	163	0.000e+00	1.952e+04	24	164	3.704e-02	1.895e+09	24	165	7.248e-01	2.888e+10
24	167	0.000e+00	2.040e+05	24	168	0.000e+00	1.554e+06	24	170	0.000e+00	4.762e+05
24	172	2.148e-01	1.110e+10	24	173	2.161e-02	1.567e+09	24	175	0.000e+00	2.585e+05
24	176	0.000e+00	5.526e+04	24	177	0.000e+00	6.410e+03	24	178	0.000e+00	1.437e+04
24	179	2.672e-02	1.086e+09	24	181	1.286e-02	6.744e+08	24	182	2.694e-01	1.099e+10
24	183	2.761e-04	2.032e+07	24	186	8.391e-02	6.364e+09	24	187	2.700e-03	2.052e+08
24	188	4.339e-04	1.843e+07	24	189	0.000e+00	1.603e+04	24	190	0.000e+00	5.515e+05
24	191	0.000e+00	3.314e+05	24	192	0.000e+00	7.866e+06	24	193	0.000e+00	2.828e+06
24	194	0.000e+00	1.224e+04	24	197	0.000e+00	7.864e+04	24	198	0.000e+00	1.105e+07
24	199	0.000e+00	1.700e+06	24	200	0.000e+00	3.097e+05	24	201	0.000e+00	4.687e+06
24	202	0.000e+00	2.521e+06	24	203	0.000e+00	1.628e+06	24	204	0.000e+00	1.359e+06
24	211	2.023e-02	2.111e+09	24	212	1.304e-01	9.723e+09	24	214	0.000e+00	9.611e+03
24	215	0.000e+00	1.602e+05	24	216	0.000e+00	9.095e+05	24	217	0.000e+00	1.512e+06
24	218	0.000e+00	1.942e+04	24	219	0.000e+00	2.513e+05	24	220	0.000e+00	1.100e+06
24	221	0.000e+00	3.744e+04	24	222	0.000e+00	7.715e+04	24	224	0.000e+00	6.487e+03
24	226	1.497e-03	1.289e+08	24	228	2.596e-02	3.141e+09	24	229	2.259e-01	1.953e+10
24	230	1.824e-04	1.579e+07	24	231	9.447e-04	6.363e+07	24	235	7.643e-04	9.359e+07
24	236	2.836e-02	2.481e+09	24	237	3.529e-01	2.402e+10	24	238	2.513e-03	3.117e+08
24	241	2.899e-02	3.600e+09	24	242	1.552e-04	1.073e+07	24	243	0.000e+00	2.342e+04
24	245	0.000e+00	1.224e+04	24	247	0.000e+00	1.640e+05	24	248	0.000e+00	1.352e+06
24	249	0.000e+00	4.128e+06	24	252	0.000e+00	4.285e+04	24	254	0.000e+00	5.748e+05
24	256	0.000e+00	3.632e+06	24	262	0.000e+00	1.497e+05	24	263	0.000e+00	1.030e+06
24	264	0.000e+00	2.140e+06	24	265	5.182e-04	3.661e+07	24	268	1.830e-04	1.663e+07
24	269	1.951e-03	1.379e+08	24	272	0.000e+00	4.223e+05	24	273	0.000e+00	2.543e+05
24	277	7.645e-04	6.994e+07	24	278	9.770e-05	1.252e+07	25	32	8.627e-04	2.675e+06
25	36	3.335e+00	9.942e+09	25	37	3.083e-01	1.657e+09	25	40	3.821e-03	2.116e+07
25	45	2.007e-01	1.925e+09	25	52	0.000e+00	1.081e+05	25	61	2.242e-03	3.996e+07
25	62	2.492e-01	4.725e+09	25	67	0.000e+00	9.234e+04	25	68	0.000e+00	1.021e+05
25	69	0.000e+00	9.249e+03	25	70	0.000e+00	1.588e+04	25	72	0.000e+00	8.118e+03
25	73	0.000e+00	7.512e+04	25	74	0.000e+00	2.523e+04	25	75	0.000e+00	5.741e+04
25	77	0.000e+00	1.973e+05	25	81	0.000e+00	2.800e+04	25	82	1.932e-01	4.111e+09
25	83	3.266e-02	5.456e+08	25	84	4.314e-01	9.293e+09	25	86	4.727e-04	1.444e+07
25	87	3.607e-02	7.908e+08	25	88	8.872e-03	1.518e+08	25	89	9.666e-03	2.170e+08

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
25	90	6.601e-04	2.079e+07	25	92	1.376e-01	4.384e+09	25	93	4.128e+00	7.375e+10
25	94	2.726e-03	6.372e+07	25	95	4.857e-04	1.593e+07	25	97	4.842e-03	1.646e+08
25	101	0.000e+00	7.896e+04	25	105	1.456e+00	2.967e+10	25	107	5.335e-04	2.062e+07
25	108	7.436e-04	2.055e+07	25	109	5.275e-01	2.103e+10	25	111	0.000e+00	2.115e+04
25	112	0.000e+00	1.422e+06	25	113	0.000e+00	3.240e+05	25	114	0.000e+00	9.542e+04
25	118	0.000e+00	1.818e+04	25	122	0.000e+00	8.989e+03	25	124	0.000e+00	7.538e+05
25	127	0.000e+00	2.070e+06	25	128	2.839e-03	1.480e+08	25	132	1.436e-03	7.607e+07
25	134	1.062e-01	5.736e+09	25	136	0.000e+00	5.204e+04	25	138	0.000e+00	2.067e+04
25	139	0.000e+00	3.275e+04	25	140	0.000e+00	2.324e+04	25	141	0.000e+00	3.690e+03
25	143	0.000e+00	4.224e+03	25	144	3.775e-01	1.636e+10	25	145	0.000e+00	7.901e+03
25	147	0.000e+00	6.959e+05	25	149	1.262e-04	7.752e+06	25	150	1.863e-03	8.175e+07
25	151	1.301e-03	5.726e+07	25	152	9.053e-03	3.102e+08	25	155	4.207e-02	1.864e+09
25	156	0.000e+00	8.399e+05	25	157	0.000e+00	1.382e+04	25	158	3.094e-03	1.374e+08
25	159	4.671e-04	2.906e+07	25	160	0.000e+00	3.301e+05	25	161	5.671e-02	1.961e+09
25	162	0.000e+00	3.663e+04	25	164	2.013e-02	9.026e+08	25	165	9.369e-03	3.273e+08
25	167	0.000e+00	2.657e+04	25	168	0.000e+00	8.379e+04	25	170	0.000e+00	1.273e+06
25	172	5.660e-03	2.565e+08	25	173	3.930e-04	2.499e+07	25	179	2.245e+00	8.006e+10
25	180	7.661e-04	4.934e+07	25	181	2.170e-04	9.985e+06	25	182	4.162e-02	1.491e+09
25	183	2.039e-02	1.318e+09	25	186	6.304e-04	4.207e+07	25	187	3.146e-02	2.104e+09
25	188	3.324e-01	1.243e+10	25	189	0.000e+00	7.730e+06	25	190	0.000e+00	4.723e+04
25	196	0.000e+00	8.136e+05	25	206	0.000e+00	1.954e+06	25	208	0.000e+00	5.060e+04
25	209	0.000e+00	1.564e+07	25	211	6.791e-04	6.358e+07	25	212	1.574e-04	1.053e+07
25	213	1.593e-01	1.502e+10	25	214	0.000e+00	3.435e+06	25	216	0.000e+00	6.029e+03
25	218	0.000e+00	4.340e+04	25	221	0.000e+00	5.114e+03	25	222	0.000e+00	8.084e+03
25	224	0.000e+00	8.120e+05	25	225	0.000e+00	2.148e+06	25	226	1.859e-01	1.447e+10
25	228	6.445e-05	7.050e+06	25	229	1.521e-03	1.189e+08	25	230	1.215e-04	9.515e+06
25	231	4.037e-04	2.459e+07	25	238	5.906e-03	6.633e+08	25	241	6.964e-04	7.829e+07
25	242	6.405e-01	4.008e+10	25	243	0.000e+00	3.827e+06	25	244	0.000e+00	3.692e+04
25	245	0.000e+00	3.238e+03	25	249	0.000e+00	1.845e+04	25	250	0.000e+00	4.631e+04
25	253	1.264e-04	8.061e+06	25	259	9.271e-05	5.920e+06	25	261	1.438e-04	1.183e+07
25	265	2.179e-02	1.395e+09	25	269	4.114e-03	2.636e+08	25	275	0.000e+00	6.271e+05
25	280	9.194e-04	1.071e+08	25	282	0.000e+00	6.924e+06	25	283	0.000e+00	2.825e+04
26	28	9.179e-03	7.979e+07	26	31	6.203e-04	2.397e+06	26	37	7.696e-01	3.731e+09
26	39	3.755e-04	9.380e+06	26	40	5.564e-03	2.784e+07	26	41	8.135e-01	3.341e+10
26	45	1.859e-03	1.651e+07	26	52	0.000e+00	5.789e+04	26	53	0.000e+00	2.086e+04
26	54	7.045e-02	1.784e+09	26	55	9.861e-03	2.585e+08	26	58	1.748e-04	1.445e+07
26	59	1.885e-03	5.215e+07	26	60	4.685e-04	1.315e+07	26	62	1.169e-02	2.099e+08
26	63	7.229e-02	7.048e+09	26	65	1.055e-02	1.227e+09	26	66	0.000e+00	6.856e+03
26	67	0.000e+00	4.261e+04	26	68	0.000e+00	4.981e+04	26	70	0.000e+00	1.437e+04
26	72	0.000e+00	3.875e+03	26	73	0.000e+00	6.352e+04	26	74	0.000e+00	1.359e+04
26	75	0.000e+00	4.502e+03	26	77	0.000e+00	1.459e+04	26	79	0.000e+00	4.123e+03
26	81	0.000e+00	2.787e+05	26	86	1.122e-02	3.285e+08	26	90	5.587e-03	1.687e+08
26	92	3.274e-01	1.001e+10	26	95	8.457e-03	2.662e+08	26	97	2.329e+00	7.602e+10
26	106	1.539e-04	9.542e+06	26	109	3.426e-01	1.316e+10	26	112	0.000e+00	1.384e+05

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
26	113	0.000e+00	3.372e+04	26	114	0.000e+00	1.123e+04	26	124	0.000e+00	9.928e+05
26	125	9.155e-03	7.615e+08	26	126	3.609e-03	3.030e+08	26	127	0.000e+00	1.107e+05
26	128	3.663e-04	1.849e+07	26	129	2.965e-04	7.518e+07	26	130	2.801e-03	2.380e+08
26	132	1.484e-04	7.610e+06	26	133	3.718e-04	3.193e+07	26	134	6.851e-03	3.585e+08
26	135	1.343e-02	3.574e+09	26	136	0.000e+00	1.434e+05	26	137	0.000e+00	4.376e+03
26	138	0.000e+00	6.405e+03	26	139	0.000e+00	9.202e+03	26	140	0.000e+00	6.267e+04
26	143	0.000e+00	1.131e+04	26	147	0.000e+00	1.093e+05	26	148	3.636e-04	3.611e+07
26	154	2.905e-01	2.906e+10	26	156	0.000e+00	3.370e+05	26	159	1.506e-02	9.096e+08
26	163	0.000e+00	1.631e+05	26	171	2.894e-04	2.970e+07	26	173	2.042e-02	1.261e+09
26	176	0.000e+00	9.968e+05	26	178	0.000e+00	1.625e+06	26	180	5.353e-02	3.348e+09
26	183	8.178e-01	5.134e+10	26	185	8.902e-05	2.885e+07	26	186	2.219e-03	1.439e+08
26	187	7.720e-02	5.017e+09	26	196	0.000e+00	7.454e+06	26	206	0.000e+00	4.664e+06
26	207	7.100e-02	2.515e+10	26	208	0.000e+00	1.167e+07	26	213	6.947e-02	6.393e+09
26	214	0.000e+00	5.981e+05	26	218	0.000e+00	5.600e+03	26	224	0.000e+00	1.460e+06
26	225	0.000e+00	1.702e+05	26	227	1.073e-03	1.912e+08	26	233	1.947e-01	3.482e+10
26	234	4.169e-04	7.517e+07	26	235	6.666e-05	7.223e+06	26	238	1.119e-01	1.229e+10
26	239	2.872e-05	1.579e+07	26	241	9.034e-03	9.934e+08	26	247	0.000e+00	6.182e+03
26	250	0.000e+00	6.039e+06	26	275	0.000e+00	9.778e+05	26	278	4.687e-05	5.329e+06
26	280	7.748e-03	8.836e+08	26	281	2.981e-02	1.702e+10	26	283	0.000e+00	4.674e+06
27	29	2.443e-01	8.073e+08	27	30	6.621e-01	7.353e+08	27	33	1.254e+00	8.666e+08
27	35	7.691e-02	9.130e+07	27	42	0.000e+00	4.625e+04	27	43	0.000e+00	4.649e+04
27	44	0.000e+00	4.685e+04	27	46	1.957e-01	4.341e+09	27	47	5.748e-01	4.309e+09
27	48	1.002e+00	4.683e+09	27	52	1.693e-02	1.461e+08	27	55	0.000e+00	4.435e+03
27	56	0.000e+00	4.823e+03	27	57	0.000e+00	4.583e+03	27	66	1.820e-03	4.454e+07
27	67	6.717e-03	9.864e+07	27	70	7.316e-02	1.842e+09	27	71	3.285e-02	2.482e+09
27	72	1.371e-01	2.076e+09	27	73	1.955e-02	4.950e+08	27	78	5.060e-02	8.314e+08
27	79	2.633e-02	7.238e+08	27	80	8.311e-03	6.875e+08	27	81	3.399e-04	9.658e+06
27	89	0.000e+00	1.424e+05	27	90	0.000e+00	1.670e+05	27	91	0.000e+00	1.907e+05
27	94	0.000e+00	2.644e+05	27	95	0.000e+00	2.381e+05	27	96	0.000e+00	2.194e+05
27	106	0.000e+00	3.710e+05	27	107	0.000e+00	3.711e+05	27	108	0.000e+00	3.722e+05
27	110	1.324e-04	2.063e+07	27	111	3.208e-04	1.668e+07	27	113	4.887e-04	1.550e+07
27	121	3.225e-05	5.452e+06	27	122	7.288e-05	4.106e+06	28	30	4.816e-02	3.250e+07
28	35	4.392e-01	3.228e+08	28	45	0.000e+00	2.944e+04	28	47	2.331e-02	1.463e+08
28	52	8.454e-01	6.188e+09	28	66	3.459e-03	7.687e+07	28	70	1.729e-02	3.959e+08
28	73	7.249e-02	1.670e+09	28	79	1.081e-03	2.714e+07	28	81	2.763e-02	7.181e+08
28	92	0.000e+00	5.477e+05	28	97	0.000e+00	1.345e+05	28	109	0.000e+00	2.374e+05
28	114	2.410e-04	1.200e+07	28	127	1.252e-04	6.971e+06	28	187	0.000e+00	1.696e+04
28	208	2.278e-03	1.982e+08	28	225	1.332e-04	1.684e+07	28	280	0.000e+00	7.257e+03
28	283	7.576e-04	1.118e+08	29	42	5.767e-01	9.732e+08	29	54	4.576e-02	2.889e+08
29	55	3.597e-01	2.433e+09	29	59	8.310e-02	6.244e+08	29	60	2.312e-01	1.785e+09
29	64	1.260e-01	1.585e+09	29	72	0.000e+00	6.305e+04	29	74	0.000e+00	2.300e+03
29	78	0.000e+00	4.192e+04	29	91	5.961e-02	1.251e+09	29	96	4.414e-02	9.884e+08
29	98	0.000e+00	6.258e+05	29	113	0.000e+00	1.825e+04	29	116	0.000e+00	1.658e+05
29	118	0.000e+00	9.987e+04	29	123	0.000e+00	5.488e+04	29	126	1.798e-04	7.933e+06

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
29	174	1.849e-04	1.079e+07	29	177	0.000e+00	1.096e+04	30	42	3.854e-01	6.462e+08
30	43	1.181e+00	1.191e+09	30	45	1.694e-01	1.781e+08	30	54	2.348e-01	1.477e+09
30	55	1.803e-01	1.215e+09	30	56	7.766e-01	3.188e+09	30	58	1.842e-01	4.107e+09
30	59	4.508e-03	3.376e+07	30	60	2.952e-01	2.271e+09	30	61	3.585e-01	1.658e+09
30	62	8.282e-02	4.318e+08	30	63	1.629e-02	4.934e+08	30	64	3.433e-01	4.307e+09
30	65	2.475e-02	1.019e+09	30	67	0.000e+00	8.755e+03	30	70	0.000e+00	3.239e+04
30	72	0.000e+00	1.251e+05	30	73	0.000e+00	7.577e+04	30	74	0.000e+00	1.975e+03
30	77	0.000e+00	7.635e+03	30	78	0.000e+00	8.530e+04	30	79	0.000e+00	2.867e+04
30	81	0.000e+00	4.599e+04	30	86	1.452e-03	1.735e+07	30	90	1.137e-01	1.426e+09
30	91	4.047e-02	8.478e+08	30	92	1.159e-02	1.480e+08	30	95	1.070e-01	1.430e+09
30	96	3.014e-02	6.736e+08	30	97	4.414e-03	6.235e+07	30	98	0.000e+00	5.615e+05
30	99	0.000e+00	8.031e+05	30	101	0.000e+00	1.228e+05	30	109	3.112e-03	5.600e+07
30	111	0.000e+00	1.758e+04	30	112	0.000e+00	7.740e+04	30	115	0.000e+00	2.269e+05
30	116	0.000e+00	6.886e+03	30	117	0.000e+00	1.722e+05	30	118	0.000e+00	1.425e+05
30	119	0.000e+00	1.359e+05	30	122	0.000e+00	6.884e+04	30	123	0.000e+00	1.155e+05
30	124	0.000e+00	2.138e+04	30	127	0.000e+00	1.110e+04	30	128	3.296e-04	8.740e+06
30	130	1.411e-04	6.323e+06	30	173	3.184e-04	1.110e+07	30	176	0.000e+00	1.422e+04
30	177	0.000e+00	9.930e+03	30	185	6.365e-05	1.183e+07	30	207	2.312e-05	4.826e+06
30	233	1.582e-04	1.862e+07	30	234	8.876e-05	1.055e+07	31	66	2.125e-02	3.198e+08
31	67	2.236e-03	2.019e+07	31	68	9.707e-04	8.831e+06	31	70	1.480e-03	2.309e+07
31	73	3.685e-04	5.792e+06	31	74	1.597e-03	1.515e+07	31	106	0.000e+00	2.819e+05
31	107	0.000e+00	1.206e+05	31	108	0.000e+00	8.716e+03	31	111	7.067e-04	2.667e+07
31	112	1.663e-03	3.827e+07	31	113	2.434e-03	5.619e+07	31	114	5.363e-03	2.076e+08
31	115	3.962e-01	1.548e+10	31	116	1.397e-01	3.278e+09	31	117	7.586e-03	1.274e+08
31	118	2.129e-01	5.039e+09	31	119	2.954e-02	5.009e+08	31	122	3.723e-04	1.543e+07
31	126	0.000e+00	5.467e+03	31	129	0.000e+00	3.640e+04	31	130	0.000e+00	6.470e+03
31	136	1.203e-03	3.777e+07	31	137	2.281e-03	7.187e+07	31	138	5.524e-04	2.906e+07
31	139	3.488e-04	7.873e+06	31	140	2.388e-03	7.635e+07	31	141	4.170e-04	9.551e+06
31	148	0.000e+00	5.021e+05	31	149	0.000e+00	2.171e+05	31	150	0.000e+00	1.155e+04
31	151	0.000e+00	3.521e+05	31	152	0.000e+00	6.581e+04	31	155	0.000e+00	9.152e+04
31	158	0.000e+00	5.156e+04	31	161	0.000e+00	1.023e+04	31	163	3.106e-01	7.529e+09
31	164	0.000e+00	2.552e+04	31	176	1.786e-02	4.451e+08	31	177	1.435e-01	5.039e+09
31	178	1.225e-02	3.076e+08	31	180	0.000e+00	5.129e+04	31	181	0.000e+00	1.909e+04
31	184	0.000e+00	2.471e+05	31	185	0.000e+00	7.429e+05	31	186	0.000e+00	1.995e+04
31	191	1.718e+00	6.596e+10	31	193	2.609e-01	7.161e+09	31	196	3.804e-03	1.484e+08
31	197	5.835e+00	1.676e+11	31	200	1.508e-01	1.018e+10	31	201	2.012e-02	5.824e+08
31	202	2.259e-02	9.156e+08	31	204	1.071e-03	7.315e+07	31	206	4.587e-03	1.358e+08
31	210	0.000e+00	2.819e+05	31	211	0.000e+00	1.209e+05	31	212	0.000e+00	8.760e+03
31	214	9.237e-04	5.788e+07	31	215	7.974e-02	8.358e+09	31	216	2.058e-02	1.295e+09
31	217	9.354e-04	4.208e+07	31	218	3.965e-02	2.504e+09	31	219	5.295e-03	2.392e+08
31	222	7.991e-05	8.510e+06	31	227	0.000e+00	4.543e+05	31	228	0.000e+00	1.986e+05
31	229	0.000e+00	1.175e+04	31	230	0.000e+00	5.692e+05	31	231	0.000e+00	8.878e+04
31	235	0.000e+00	6.719e+04	31	236	0.000e+00	2.383e+04	31	239	0.000e+00	1.235e+06
31	240	0.000e+00	4.071e+05	31	241	0.000e+00	3.084e+04	31	247	3.744e-01	2.751e+10

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
31	248	5.724e-02	3.005e+09	31	250	7.438e-04	5.504e+07	31	252	1.621e+00	8.629e+10
31	253	0.000e+00	8.399e+06	31	258	0.000e+00	3.738e+06	31	261	0.000e+00	3.407e+04
31	262	4.887e-02	6.099e+09	31	263	7.239e-03	5.421e+08	31	264	5.921e-04	3.168e+07
31	265	0.000e+00	2.972e+04	31	267	0.000e+00	8.839e+05	31	268	0.000e+00	1.554e+05
31	273	4.384e-04	5.489e+07	31	275	9.357e-04	5.030e+07	31	278	0.000e+00	2.789e+04
31	279	0.000e+00	9.713e+04	32	67	1.695e-02	1.530e+08	32	68	1.430e-02	1.300e+08
32	69	2.821e-03	1.835e+07	32	72	1.586e-03	1.487e+07	32	74	1.395e-03	1.323e+07
32	75	2.230e-03	1.515e+07	32	78	2.501e-04	2.602e+06	32	106	0.000e+00	1.409e+05
32	107	0.000e+00	2.113e+05	32	108	0.000e+00	9.078e+04	32	112	2.659e-03	6.113e+07
32	113	1.431e-03	3.302e+07	32	116	5.119e-01	1.200e+10	32	117	1.614e-01	2.708e+09
32	118	1.129e-01	2.671e+09	32	119	2.842e-01	4.816e+09	32	120	3.516e-02	4.652e+08
32	123	7.421e-04	1.847e+07	32	124	6.287e-04	1.133e+07	32	130	0.000e+00	1.934e+04
32	132	0.000e+00	5.457e+03	32	136	2.453e-04	7.692e+06	32	139	3.935e-03	8.877e+07
32	140	1.415e-03	4.520e+07	32	141	3.763e-03	8.613e+07	32	142	8.449e-04	1.511e+07
32	143	1.429e-04	4.636e+06	32	147	6.246e-04	1.467e+07	32	148	0.000e+00	2.485e+05
32	149	0.000e+00	3.776e+05	32	150	0.000e+00	1.693e+05	32	151	0.000e+00	9.354e+04
32	152	0.000e+00	3.890e+05	32	153	0.000e+00	6.183e+04	32	155	0.000e+00	2.586e+04
32	157	3.415e-02	6.382e+08	32	158	0.000e+00	1.805e+04	32	161	0.000e+00	6.024e+04
32	162	2.222e-01	4.185e+09	32	163	5.941e-03	1.440e+08	32	165	0.000e+00	2.577e+04
32	167	1.748e-01	3.328e+09	32	175	7.862e-03	1.522e+08	32	176	1.277e-01	3.183e+09
32	177	1.780e-02	6.246e+08	32	178	7.767e-02	1.949e+09	32	180	0.000e+00	2.586e+04
32	181	0.000e+00	4.427e+04	32	182	0.000e+00	1.543e+04	32	184	0.000e+00	4.973e+05
32	186	0.000e+00	1.414e+05	32	187	0.000e+00	5.953e+03	32	189	6.261e-04	1.310e+07
32	190	4.607e-03	9.816e+07	32	191	2.084e-01	7.997e+09	32	192	2.559e-01	5.457e+09
32	193	2.251e+00	6.173e+10	32	196	7.656e-04	2.984e+07	32	197	5.568e-01	1.598e+10
32	199	7.716e+00	1.725e+11	32	201	1.596e-02	4.618e+08	32	202	2.304e-01	9.333e+09
32	206	8.048e-04	2.381e+07	32	210	0.000e+00	1.397e+05	32	211	0.000e+00	2.096e+05
32	212	0.000e+00	9.088e+04	32	216	1.109e-01	6.976e+09	32	217	2.337e-02	1.051e+09
32	218	1.257e-02	7.940e+08	32	219	5.253e-02	2.372e+09	32	220	5.874e-03	2.066e+08
32	221	1.751e-04	1.118e+07	32	227	0.000e+00	2.186e+05	32	228	0.000e+00	3.402e+05
32	229	0.000e+00	1.518e+05	32	230	0.000e+00	1.632e+05	32	231	0.000e+00	5.211e+05
32	232	0.000e+00	7.483e+04	32	235	0.000e+00	3.270e+04	32	236	0.000e+00	5.166e+04
32	237	0.000e+00	2.006e+04	32	238	0.000e+00	1.487e+04	32	240	0.000e+00	8.273e+05
32	241	0.000e+00	2.264e+05	32	243	8.251e-04	3.351e+07	32	244	4.142e-04	1.686e+07
32	247	4.477e-02	3.289e+09	32	248	4.861e-01	2.551e+10	32	249	5.939e-02	2.425e+09
32	250	1.533e-04	1.134e+07	32	251	0.000e+00	1.933e+05	32	252	1.529e-01	8.136e+09
32	253	0.000e+00	2.655e+05	32	254	2.130e+00	8.819e+10	32	255	0.000e+00	8.327e+06
32	258	0.000e+00	9.342e+05	32	259	0.000e+00	4.296e+06	32	260	0.000e+00	4.070e+04
32	261	0.000e+00	1.699e+04	32	263	7.372e-02	5.519e+09	32	264	6.369e-03	3.406e+08
32	266	0.000e+00	1.631e+04	32	267	0.000e+00	3.695e+05	32	268	0.000e+00	8.404e+05
32	269	0.000e+00	1.241e+05	32	272	1.039e-03	7.801e+07	32	275	5.064e-04	2.721e+07
32	277	0.000e+00	2.114e+04	32	278	0.000e+00	8.453e+04	32	279	0.000e+00	4.822e+04
33	42	2.829e-02	4.600e+07	33	43	4.278e-01	4.186e+08	33	44	2.424e+00	1.702e+09
33	51	0.000e+00	1.496e+04	33	55	4.927e-02	3.272e+08	33	56	4.200e-01	1.698e+09

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
33	57	1.854e+00	5.559e+09	33	59	5.102e-01	3.767e+09	33	60	6.304e-02	4.783e+08
33	61	6.301e-01	2.873e+09	33	62	1.993e-02	1.025e+08	33	64	6.543e-01	8.119e+09
33	70	0.000e+00	2.078e+05	33	71	0.000e+00	3.706e+05	33	72	0.000e+00	1.124e+05
33	73	0.000e+00	5.769e+04	33	76	0.000e+00	5.038e+03	33	78	0.000e+00	7.149e+04
33	79	0.000e+00	1.316e+05	33	80	0.000e+00	1.670e+05	33	87	3.258e-03	2.776e+07
33	89	2.022e-01	1.789e+09	33	90	4.148e-02	5.156e+08	33	91	3.116e-03	6.471e+07
33	92	5.779e-04	7.318e+06	33	94	2.422e-01	2.284e+09	33	95	3.860e-02	5.116e+08
33	96	2.345e-03	5.198e+07	33	98	0.000e+00	8.892e+04	33	99	0.000e+00	4.444e+05
33	100	0.000e+00	1.333e+06	33	110	0.000e+00	3.362e+04	33	111	0.000e+00	1.885e+04
33	113	0.000e+00	1.085e+04	33	114	0.000e+00	1.525e+04	33	115	0.000e+00	7.119e+04
33	116	0.000e+00	1.597e+05	33	117	0.000e+00	1.501e+05	33	118	0.000e+00	5.427e+04
33	119	0.000e+00	1.848e+05	33	120	0.000e+00	3.341e+05	33	121	0.000e+00	3.287e+05
33	122	0.000e+00	2.501e+05	33	123	0.000e+00	1.182e+05	33	131	7.677e-04	1.468e+07
33	133	2.385e-04	1.078e+07	33	142	0.000e+00	1.889e+03	33	172	7.454e-04	1.840e+07
33	175	0.000e+00	2.053e+04	33	176	0.000e+00	3.995e+03	33	184	9.846e-05	6.069e+06
33	186	2.390e-04	8.842e+06	33	223	0.000e+00	5.024e+03	33	229	1.373e-04	6.877e+06
33	234	1.781e-04	2.110e+07	34	69	4.443e-02	2.884e+08	34	75	5.324e-03	3.610e+07
34	76	1.209e-03	6.501e+06	34	107	0.000e+00	9.047e+04	34	108	0.000e+00	3.232e+05
34	117	7.428e-01	1.245e+10	34	119	1.496e-01	2.531e+09	34	120	5.284e-01	6.981e+09
34	132	0.000e+00	2.937e+04	34	141	2.469e-03	5.646e+07	34	142	1.331e-02	2.377e+08
34	149	0.000e+00	1.595e+05	34	150	0.000e+00	5.715e+05	34	151	0.000e+00	8.577e+03
34	152	0.000e+00	9.643e+04	34	153	0.000e+00	5.560e+05	34	157	3.057e-03	5.706e+07
34	160	1.429e-01	2.186e+09	34	161	0.000e+00	1.649e+04	34	162	8.518e-04	1.602e+07
34	167	8.323e-03	1.582e+08	34	168	3.046e-01	4.739e+09	34	169	0.000e+00	5.399e+04
34	170	1.322e-01	2.064e+09	34	175	2.534e-01	4.900e+09	34	176	9.643e-03	2.400e+08
34	178	7.600e-03	1.905e+08	34	181	0.000e+00	2.033e+04	34	182	0.000e+00	6.646e+04
34	186	0.000e+00	5.540e+05	34	187	0.000e+00	2.003e+04	34	189	3.080e-03	6.435e+07
34	190	2.048e-01	4.358e+09	34	192	3.061e+00	6.521e+10	34	193	2.146e-01	5.881e+09
34	194	3.588e-03	6.264e+07	34	197	4.924e-03	1.412e+08	34	198	1.008e+01	1.842e+11
34	199	5.378e-01	1.201e+10	34	201	3.326e-01	9.612e+09	34	211	0.000e+00	8.905e+04
34	212	0.000e+00	3.212e+05	34	217	1.591e-01	7.151e+09	34	219	1.670e-02	7.534e+08
34	220	8.752e-02	3.075e+09	34	228	0.000e+00	1.385e+05	34	229	0.000e+00	5.076e+05
34	230	0.000e+00	1.038e+04	34	231	0.000e+00	1.327e+05	34	232	0.000e+00	6.679e+05
34	236	0.000e+00	2.527e+04	34	237	0.000e+00	7.952e+04	34	238	0.000e+00	7.130e+04
34	241	0.000e+00	8.799e+05	34	243	1.716e-03	6.963e+07	34	245	4.152e-04	1.382e+07
34	248	4.439e-02	2.328e+09	34	249	6.935e-01	2.829e+10	34	251	0.000e+00	1.252e+04
34	252	2.401e-03	1.276e+08	34	254	1.550e-01	6.412e+09	34	255	0.000e+00	8.679e+04
34	256	2.793e+00	9.455e+10	34	257	0.000e+00	8.982e+06	34	258	0.000e+00	3.772e+04
34	259	0.000e+00	7.398e+05	34	260	0.000e+00	5.100e+06	34	264	1.078e-01	5.762e+09
34	265	0.000e+00	2.287e+05	34	267	0.000e+00	1.656e+04	34	268	0.000e+00	2.862e+05
34	269	0.000e+00	9.595e+05	34	270	0.000e+00	1.716e+04	34	277	0.000e+00	1.238e+05
34	278	0.000e+00	3.241e+04	35	41	1.748e-03	6.825e+06	35	42	4.425e-02	7.016e+07
35	43	1.195e-01	1.140e+08	35	45	1.557e+00	1.550e+09	35	53	0.000e+00	1.946e+04
35	54	5.479e-01	3.349e+09	35	55	2.087e-01	1.369e+09	35	56	1.217e-01	4.860e+08

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
35	58	1.154e-02	2.507e+08	35	59	8.425e-03	6.146e+07	35	60	5.928e-02	4.444e+08
35	61	7.442e-03	3.354e+07	35	62	7.642e-01	3.888e+09	35	63	2.602e-01	7.703e+09
35	64	3.948e-02	4.855e+08	35	65	2.031e-01	8.199e+09	35	66	0.000e+00	6.653e+03
35	68	0.000e+00	5.553e+03	35	70	0.000e+00	7.782e+04	35	72	0.000e+00	1.885e+04
35	73	0.000e+00	1.374e+05	35	75	0.000e+00	1.238e+04	35	77	0.000e+00	2.611e+04
35	78	0.000e+00	8.320e+03	35	79	0.000e+00	2.554e+04	35	81	0.000e+00	3.053e+05
35	90	7.672e-03	9.469e+07	35	91	4.941e-03	1.019e+08	35	92	2.107e-01	2.649e+09
35	95	5.353e-03	7.045e+07	35	96	3.619e-03	7.967e+07	35	97	6.550e-02	9.116e+08
35	98	0.000e+00	6.329e+04	35	99	0.000e+00	8.904e+04	35	101	0.000e+00	1.080e+06
35	109	3.300e-02	5.861e+08	35	112	0.000e+00	1.943e+05	35	113	0.000e+00	7.570e+04
35	114	0.000e+00	4.145e+04	35	115	0.000e+00	3.207e+04	35	117	0.000e+00	1.384e+04
35	118	0.000e+00	3.567e+04	35	119	0.000e+00	1.248e+04	35	123	0.000e+00	1.780e+04
35	124	0.000e+00	2.585e+05	35	125	6.609e-04	2.845e+07	35	126	1.075e-04	4.687e+06
35	127	0.000e+00	1.568e+05	35	129	2.812e-05	3.712e+06	35	134	5.255e-04	1.449e+07
35	135	2.150e-04	3.036e+07	35	136	0.000e+00	6.622e+03	35	147	0.000e+00	3.024e+04
35	154	7.366e-04	4.080e+07	35	156	0.000e+00	2.435e+04	35	176	0.000e+00	5.489e+03
35	178	0.000e+00	2.402e+04	35	183	4.981e-04	1.758e+07	35	187	6.366e-04	2.353e+07
35	196	0.000e+00	2.130e+04	35	207	1.529e-04	3.165e+07	35	208	0.000e+00	3.187e+04
35	213	1.389e-04	8.047e+06	35	225	0.000e+00	1.218e+04	35	233	1.492e-03	1.744e+08
35	238	1.111e-04	8.021e+06	35	250	0.000e+00	2.544e+04	35	281	3.117e-05	1.181e+07
35	283	0.000e+00	1.176e+04	36	62	0.000e+00	4.145e+03	36	69	1.220e-02	6.759e+07
36	75	5.705e-02	3.313e+08	36	77	1.767e-01	1.051e+09	36	101	2.032e-02	1.880e+08
36	109	0.000e+00	3.943e+05	36	117	1.620e-03	2.463e+07	36	119	8.542e-04	1.312e+07
36	124	1.190e+00	1.950e+10	36	134	0.000e+00	5.415e+04	36	144	0.000e+00	6.935e+05
36	147	7.166e-04	1.549e+07	36	151	0.000e+00	3.329e+03	36	155	0.000e+00	2.181e+04
36	157	2.959e-02	5.094e+08	36	160	3.286e-01	4.637e+09	36	162	8.483e-02	1.472e+09
36	163	2.186e-04	4.881e+06	36	167	8.971e-02	1.574e+09	36	168	7.072e-02	1.016e+09
36	170	1.177e+00	1.697e+10	36	175	1.843e-02	3.291e+08	36	176	1.562e-03	3.591e+07
36	178	2.898e-03	6.713e+07	36	179	0.000e+00	1.117e+04	36	186	0.000e+00	9.230e+03
36	187	0.000e+00	2.648e+05	36	188	0.000e+00	1.094e+06	36	189	2.192e+00	4.244e+10
36	190	1.118e-02	2.207e+08	36	194	2.792e-03	4.520e+07	36	206	1.263e-01	3.472e+09
36	209	9.464e+00	1.753e+11	36	213	0.000e+00	4.110e+05	36	217	2.422e-04	1.026e+07
36	224	2.625e-01	1.138e+10	36	226	0.000e+00	6.303e+05	36	238	0.000e+00	6.157e+05
36	241	0.000e+00	4.946e+04	36	242	0.000e+00	1.308e+06	36	243	4.168e-01	1.601e+10
36	244	4.577e-03	1.763e+08	36	245	2.362e-04	7.447e+06	36	249	1.480e-03	5.718e+07
36	251	0.000e+00	2.971e+06	36	255	0.000e+00	6.973e+04	36	260	0.000e+00	1.686e+04
36	261	0.000e+00	4.532e+04	36	265	0.000e+00	6.083e+05	36	266	0.000e+00	4.578e+03
36	269	0.000e+00	1.183e+05	36	270	0.000e+00	3.655e+04	36	275	6.099e-02	3.104e+09
36	276	0.000e+00	1.133e+07	36	280	0.000e+00	1.832e+04	36	282	3.774e+00	1.246e+11
37	52	7.243e-03	1.774e+07	37	53	2.189e-02	2.708e+07	37	65	0.000e+00	6.839e+03
37	69	1.895e-03	1.048e+07	37	75	6.798e-03	3.942e+07	37	77	1.965e-02	1.168e+08
37	79	3.784e-04	5.668e+06	37	81	1.816e-02	2.846e+08	37	92	0.000e+00	6.639e+03
37	101	2.338e-02	2.160e+08	37	105	0.000e+00	3.278e+04	37	109	0.000e+00	2.423e+05
37	111	9.336e-03	3.183e+08	37	112	3.871e-01	8.051e+09	37	113	7.833e-02	1.635e+09

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
37	114	3.559e-02	1.246e+09	37	115	2.730e-04	9.647e+06	37	117	2.310e-03	3.509e+07
37	118	5.902e-03	1.264e+08	37	122	4.281e-03	1.611e+08	37	123	8.982e-04	2.030e+07
37	124	1.435e-01	2.351e+09	37	127	2.603e-01	1.041e+10	37	129	0.000e+00	5.791e+03
37	134	0.000e+00	8.338e+03	37	135	0.000e+00	2.285e+05	37	136	1.297e-04	3.733e+06
37	140	1.321e-04	3.878e+06	37	144	0.000e+00	4.485e+05	37	147	7.621e-04	1.646e+07
37	151	0.000e+00	3.166e+03	37	154	0.000e+00	4.428e+05	37	155	0.000e+00	1.978e+04
37	163	1.965e-02	4.386e+08	37	176	1.398e-01	3.212e+09	37	178	2.315e-01	5.359e+09
37	179	0.000e+00	2.750e+04	37	182	0.000e+00	4.654e+03	37	183	0.000e+00	2.067e+04
37	188	0.000e+00	2.457e+05	37	191	7.986e-03	2.837e+08	37	196	2.871e+00	1.037e+11
37	197	5.664e-03	1.508e+08	37	201	2.996e-02	8.040e+08	37	202	3.902e-03	1.466e+08
37	203	1.028e-02	3.905e+08	37	204	4.522e-03	2.865e+08	37	206	5.145e+00	1.413e+11
37	207	0.000e+00	1.773e+06	37	208	2.002e-01	1.342e+10	37	213	0.000e+00	2.703e+05
37	214	6.969e-02	4.110e+09	37	217	4.469e-04	1.893e+07	37	218	1.014e-03	6.029e+07
37	221	1.187e-04	7.140e+06	37	222	7.561e-04	7.583e+07	37	224	3.602e-02	1.561e+09
37	225	7.615e-02	7.773e+09	37	226	0.000e+00	4.194e+05	37	227	0.000e+00	6.568e+03
37	233	0.000e+00	3.967e+05	37	238	0.000e+00	2.633e+04	37	239	0.000e+00	6.288e+03
37	242	0.000e+00	6.575e+04	37	247	1.503e-03	1.045e+08	37	250	5.923e-01	4.145e+10
37	252	1.077e-03	5.425e+07	37	253	0.000e+00	1.615e+04	37	258	0.000e+00	5.894e+04
37	259	0.000e+00	2.430e+04	37	261	0.000e+00	5.305e+06	37	263	8.067e-04	5.716e+07
37	264	2.441e-02	1.235e+09	37	265	0.000e+00	5.856e+06	37	269	0.000e+00	7.463e+05
37	272	1.880e-03	1.336e+08	37	273	1.293e-03	1.532e+08	37	275	1.551e+00	7.890e+10
37	277	0.000e+00	5.693e+03	37	278	0.000e+00	5.259e+04	37	279	0.000e+00	7.579e+03
37	280	0.000e+00	1.426e+06	37	281	0.000e+00	4.516e+06	37	283	8.928e-02	1.082e+10
38	67	8.212e-04	6.145e+06	38	68	5.132e-04	3.872e+06	38	106	0.000e+00	9.266e+04
38	107	0.000e+00	1.031e+04	38	108	0.000e+00	4.125e+04	38	110	1.296e-02	1.303e+09
38	111	7.259e-03	2.438e+08	38	112	9.914e-03	2.032e+08	38	113	2.752e-02	5.660e+08
38	114	6.069e-03	2.094e+08	38	115	3.187e-02	1.110e+09	38	116	1.088e-01	2.276e+09
38	118	4.680e-03	9.884e+07	38	121	1.361e-01	1.515e+10	38	122	1.039e-01	3.853e+09
38	123	1.483e-01	3.303e+09	38	136	9.180e-05	2.610e+06	38	137	5.590e-04	1.596e+07
38	140	2.553e-04	7.402e+06	38	143	1.467e-03	4.320e+07	38	145	1.883e-03	9.279e+07
38	146	2.261e-03	3.351e+08	38	148	0.000e+00	2.005e+05	38	149	0.000e+00	2.301e+04
38	150	0.000e+00	8.844e+04	38	180	0.000e+00	1.210e+05	38	181	0.000e+00	1.824e+05
38	184	0.000e+00	1.614e+05	38	186	0.000e+00	2.803e+05	38	187	0.000e+00	1.033e+04
38	200	7.908e-01	4.896e+10	38	202	2.755e+00	1.024e+11	38	203	6.980e-01	2.623e+10
38	204	5.615e-01	3.519e+10	38	205	6.071e-01	1.142e+11	38	210	0.000e+00	1.035e+05
38	211	0.000e+00	1.154e+04	38	212	0.000e+00	4.647e+04	38	215	6.044e-03	5.913e+08
38	216	2.228e-02	1.308e+09	38	218	2.241e-04	1.321e+07	38	221	3.052e-02	1.820e+09
38	222	2.022e-02	2.011e+09	38	223	2.603e-02	7.766e+09	38	227	0.000e+00	2.318e+05
38	228	0.000e+00	2.869e+04	38	229	0.000e+00	9.982e+04	38	235	0.000e+00	1.448e+05
38	236	0.000e+00	2.129e+05	38	238	0.000e+00	2.977e+04	38	240	0.000e+00	2.201e+05
38	241	0.000e+00	3.704e+05	38	247	1.444e-04	9.953e+06	38	258	0.000e+00	1.520e+04
38	262	1.995e-01	2.338e+10	38	263	7.698e-01	5.411e+10	38	267	0.000e+00	2.250e+06
38	268	0.000e+00	3.482e+06	38	272	1.160e-01	8.175e+09	38	273	1.477e-01	1.736e+10
38	274	1.556e-01	5.487e+10	38	277	0.000e+00	1.643e+06	38	278	0.000e+00	5.284e+05

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
38	279	0.000e+00	4.080e+06	39	66	5.814e-04	7.250e+06	39	107	0.000e+00	4.118e+04
39	111	1.362e-02	4.573e+08	39	114	1.503e-03	5.187e+07	39	115	5.607e-02	1.953e+09
39	122	1.279e-01	4.745e+09	39	127	3.914e-04	1.543e+07	39	138	3.692e-04	1.761e+07
39	145	1.688e-03	8.318e+07	39	149	0.000e+00	8.926e+04	39	180	0.000e+00	1.223e+05
39	186	0.000e+00	1.247e+05	39	187	0.000e+00	4.957e+03	39	200	1.330e+00	8.231e+10
39	204	4.732e-01	2.965e+10	39	211	0.000e+00	4.625e+04	39	215	1.001e-02	9.793e+08
39	222	2.508e-02	2.494e+09	39	225	9.515e-05	9.631e+06	39	228	0.000e+00	1.029e+05
39	235	0.000e+00	1.487e+05	39	238	0.000e+00	1.107e+04	39	241	0.000e+00	1.658e+05
39	262	3.460e-01	4.053e+10	39	267	0.000e+00	2.466e+06	39	273	1.168e-01	1.373e+10
39	278	0.000e+00	1.652e+06	39	280	0.000e+00	2.119e+04	40	69	1.944e-03	1.049e+07
40	106	0.000e+00	3.041e+04	40	107	0.000e+00	7.139e+04	40	108	0.000e+00	8.193e+04
40	111	1.233e-02	4.140e+08	40	112	9.032e-03	1.850e+08	40	113	6.773e-02	1.392e+09
40	114	8.496e-03	2.929e+08	40	115	9.315e-04	3.242e+07	40	116	3.332e-02	6.967e+08
40	117	1.949e-01	2.916e+09	40	118	9.886e-04	2.086e+07	40	119	1.046e-02	1.581e+08
40	122	1.642e-01	6.088e+09	40	123	4.845e-01	1.079e+10	40	124	1.794e-03	2.895e+07
40	127	3.003e-03	1.183e+08	40	136	1.432e-04	4.068e+06	40	139	3.749e-04	7.666e+06
40	141	5.137e-04	1.066e+07	40	143	7.752e-03	2.282e+08	40	145	2.709e-03	1.334e+08
40	148	0.000e+00	6.432e+04	40	149	0.000e+00	1.540e+05	40	150	0.000e+00	1.795e+05
40	165	0.000e+00	1.235e+04	40	176	7.945e-04	1.803e+07	40	178	1.184e-03	2.706e+07
40	179	0.000e+00	9.722e+03	40	180	0.000e+00	1.651e+04	40	181	0.000e+00	8.841e+04
40	182	0.000e+00	2.618e+05	40	184	0.000e+00	4.834e+05	40	185	0.000e+00	6.462e+05
40	186	0.000e+00	2.184e+05	40	187	0.000e+00	9.073e+03	40	191	2.548e-04	8.943e+06
40	196	1.303e-02	4.649e+08	40	197	1.025e-02	2.697e+08	40	200	2.973e-02	1.839e+09
40	201	4.983e+00	1.322e+11	40	202	8.301e-01	3.084e+10	40	203	2.330e+00	8.752e+10
40	204	7.842e-01	4.911e+10	40	206	3.174e-02	8.621e+08	40	207	0.000e+00	1.043e+04
40	208	1.331e-03	8.821e+07	40	210	0.000e+00	3.382e+04	40	211	0.000e+00	7.917e+04
40	212	0.000e+00	9.237e+04	40	215	2.521e-04	2.465e+07	40	216	4.716e-03	2.768e+08
40	217	3.670e-02	1.540e+09	40	219	6.649e-04	2.802e+07	40	221	9.956e-02	5.937e+09
40	222	3.209e-02	3.190e+09	40	224	4.029e-04	1.730e+07	40	225	8.170e-04	8.266e+07
40	227	0.000e+00	7.167e+04	40	228	0.000e+00	1.775e+05	40	229	0.000e+00	2.123e+05
40	235	0.000e+00	1.913e+04	40	236	0.000e+00	9.997e+04	40	237	0.000e+00	3.099e+05
40	238	0.000e+00	1.919e+04	40	239	0.000e+00	8.852e+05	40	240	0.000e+00	6.659e+05
40	241	0.000e+00	2.963e+05	40	248	3.231e-04	1.591e+07	40	250	1.610e-03	1.117e+08
40	258	0.000e+00	5.969e+03	40	259	0.000e+00	2.460e+04	40	261	0.000e+00	7.181e+03
40	262	6.848e-03	8.020e+08	40	263	1.494e-01	1.050e+10	40	264	1.267e+00	6.358e+10
40	265	0.000e+00	4.879e+05	40	267	0.000e+00	2.631e+05	40	268	0.000e+00	1.485e+06
40	269	0.000e+00	4.481e+06	40	272	6.611e-01	4.659e+10	40	273	2.014e-01	2.366e+10
40	275	2.478e-02	1.250e+09	40	277	0.000e+00	3.797e+06	40	278	0.000e+00	3.181e+06
40	279	0.000e+00	1.352e+06	40	280	0.000e+00	4.993e+04	40	281	0.000e+00	2.548e+04
40	283	6.474e-04	7.780e+07	41	70	5.924e-04	4.603e+06	41	73	2.537e-03	1.992e+07
41	79	2.798e-04	2.539e+06	41	81	1.314e-02	1.263e+08	41	97	0.000e+00	1.094e+04
41	109	0.000e+00	2.171e+04	41	111	8.929e-03	2.215e+08	41	114	4.293e-02	1.099e+09
41	122	1.073e-03	2.986e+07	41	127	2.306e-01	6.886e+09	41	138	3.746e-04	1.390e+07
41	156	4.104e-03	1.639e+08	41	186	0.000e+00	1.007e+04	41	187	0.000e+00	2.695e+05

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
41	208	1.829e+00	9.825e+10	41	213	0.000e+00	3.140e+04	41	215	6.419e-05	5.287e+06
41	222	1.383e-04	1.160e+07	41	225	5.943e-02	5.081e+09	41	238	0.000e+00	2.040e+05
41	241	0.000e+00	1.540e+04	41	278	0.000e+00	2.432e+04	41	280	0.000e+00	3.732e+06
41	283	5.566e-01	5.734e+10	42	49	5.750e-01	1.101e+08	42	64	0.000e+00	3.108e+04
42	66	3.521e-01	2.377e+09	42	67	7.000e-02	2.836e+08	42	68	2.560e-03	1.049e+07
42	70	4.647e-01	3.311e+09	42	71	4.319e-01	9.240e+09	42	72	5.683e-02	2.439e+08
42	73	2.793e-02	2.011e+08	42	74	3.834e-01	1.673e+09	42	78	2.134e-03	1.065e+07
42	79	1.609e-02	1.348e+08	42	80	1.105e-02	2.794e+08	42	82	0.000e+00	4.764e+04
42	84	0.000e+00	1.957e+04	42	90	0.000e+00	3.156e+04	42	91	0.000e+00	3.440e+04
42	95	0.000e+00	4.276e+04	42	96	0.000e+00	3.999e+04	42	98	1.880e+00	1.466e+10
42	102	0.000e+00	7.286e+05	42	110	3.400e-03	2.407e+08	42	111	2.211e-03	5.229e+07
42	113	3.978e-04	5.782e+06	42	115	1.362e-03	3.362e+07	42	116	1.552e-03	2.302e+07
42	118	1.051e-02	1.577e+08	42	121	1.195e-04	9.535e+06	42	122	1.532e-04	4.075e+06
42	130	0.000e+00	5.459e+03	42	137	3.232e-04	6.902e+06	42	138	2.714e-04	9.683e+06
42	145	9.526e-04	3.529e+07	42	146	1.464e-03	1.632e+08	42	148	0.000e+00	1.257e+05
42	149	0.000e+00	1.252e+05	42	150	0.000e+00	1.386e+04	42	151	0.000e+00	3.664e+05
42	155	0.000e+00	1.858e+04	42	171	0.000e+00	7.070e+04	42	173	0.000e+00	1.152e+04
42	177	2.443e-03	5.945e+07	42	180	0.000e+00	1.441e+05	42	181	0.000e+00	5.501e+04
42	183	0.000e+00	1.137e+04	42	184	0.000e+00	1.433e+05	42	186	0.000e+00	2.789e+04
42	191	7.751e-04	2.099e+07	42	215	1.338e-04	1.074e+07	42	230	0.000e+00	6.806e+03
42	273	9.354e-05	9.183e+06	42	274	1.058e-04	3.117e+07	43	49	1.061e-01	2.018e+07
43	50	8.507e-01	1.157e+08	43	64	0.000e+00	5.169e+04	43	66	3.301e-01	2.226e+09
43	67	2.100e-01	8.497e+08	43	68	4.327e-01	1.770e+09	43	69	4.137e-02	1.212e+08
43	70	5.824e-01	4.143e+09	43	72	5.433e-01	2.328e+09	43	73	2.391e-01	1.720e+09
43	75	4.949e-01	1.547e+09	43	77	1.308e-01	4.228e+08	43	78	1.437e-02	7.163e+07
43	79	9.583e-03	8.018e+07	43	81	3.459e-03	3.072e+07	43	83	0.000e+00	7.579e+04
43	89	0.000e+00	2.313e+04	43	90	0.000e+00	2.058e+04	43	91	0.000e+00	5.744e+04
43	94	0.000e+00	3.858e+04	43	95	0.000e+00	3.170e+04	43	96	0.000e+00	6.646e+04
43	98	3.479e-01	2.710e+09	43	99	2.796e+00	1.556e+10	43	102	0.000e+00	2.023e+05
43	103	0.000e+00	7.792e+05	43	111	5.630e-03	1.330e+08	43	112	6.311e-04	9.127e+06
43	113	1.728e-03	2.509e+07	43	114	1.558e-03	3.801e+07	43	115	4.388e-04	1.083e+07
43	116	8.999e-04	1.334e+07	43	117	1.949e-03	2.069e+07	43	118	2.835e-03	4.249e+07
43	119	1.421e-02	1.526e+08	43	122	3.349e-04	8.901e+06	43	123	2.715e-04	4.336e+06
43	129	0.000e+00	1.306e+04	43	132	0.000e+00	3.759e+03	43	136	1.776e-04	3.772e+06
43	139	3.890e-04	5.950e+06	43	140	1.918e-04	4.166e+06	43	143	8.181e-04	1.809e+07
43	145	3.242e-03	1.200e+08	43	148	0.000e+00	2.099e+05	43	149	0.000e+00	9.029e+04
43	150	0.000e+00	9.606e+04	43	151	0.000e+00	1.075e+05	43	152	0.000e+00	4.159e+05
43	163	2.331e-04	3.888e+06	43	171	0.000e+00	1.210e+05	43	172	0.000e+00	8.368e+03
43	174	0.000e+00	8.675e+03	43	176	1.874e-03	3.233e+07	43	177	4.486e-04	1.091e+07
43	178	1.615e-03	2.810e+07	43	180	0.000e+00	1.100e+05	43	181	0.000e+00	1.411e+05
43	182	0.000e+00	4.703e+04	43	184	0.000e+00	2.656e+04	43	185	0.000e+00	3.145e+05
43	186	0.000e+00	1.078e+05	43	193	1.085e-03	2.100e+07	43	216	2.038e-04	9.815e+06
43	227	0.000e+00	5.852e+03	43	231	0.000e+00	7.247e+03	43	234	0.000e+00	8.153e+03
43	273	2.247e-04	2.205e+07	44	50	1.057e-01	1.424e+07	44	51	1.228e+00	1.289e+08

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
44	64	0.000e+00	7.217e+04	44	67	4.558e-01	1.840e+09	44	68	9.036e-02	3.688e+08
44	69	1.408e+00	4.118e+09	44	72	1.460e+00	6.243e+09	44	74	6.592e-03	2.866e+07
44	75	6.161e-02	1.922e+08	44	76	7.243e-01	1.808e+09	44	77	3.367e-02	1.086e+08
44	78	4.942e-03	2.459e+07	44	83	0.000e+00	1.282e+04	44	85	0.000e+00	1.098e+05
44	89	0.000e+00	4.841e+04	44	90	0.000e+00	3.409e+04	44	94	0.000e+00	9.526e+04
44	95	0.000e+00	4.962e+04	44	98	9.913e-03	7.709e+07	44	99	3.494e-01	1.941e+09
44	100	4.065e+00	1.757e+10	44	102	0.000e+00	1.347e+04	44	103	0.000e+00	1.560e+05
44	104	0.000e+00	9.299e+05	44	112	1.967e-03	2.841e+07	44	113	9.110e-03	1.321e+08
44	116	7.961e-04	1.179e+07	44	117	1.875e-03	1.987e+07	44	119	2.910e-03	3.123e+07
44	120	1.966e-02	1.649e+08	44	123	1.052e-03	1.679e+07	44	132	0.000e+00	6.766e+03
44	133	0.000e+00	7.943e+03	44	136	2.512e-04	5.330e+06	44	137	3.162e-04	6.741e+06
44	141	2.089e-04	3.250e+06	44	142	6.505e-04	7.911e+06	44	143	5.745e-03	1.269e+08
44	148	0.000e+00	2.428e+04	44	149	0.000e+00	1.451e+05	44	150	0.000e+00	2.497e+05
44	151	0.000e+00	4.367e+03	44	152	0.000e+00	8.241e+04	44	153	0.000e+00	4.977e+05
44	162	7.634e-04	9.887e+06	44	171	0.000e+00	1.701e+05	44	175	4.776e-03	6.393e+07
44	176	2.402e-04	4.139e+06	44	180	0.000e+00	1.266e+04	44	181	0.000e+00	8.803e+04
44	182	0.000e+00	2.336e+05	44	184	0.000e+00	1.450e+05	44	186	0.000e+00	1.692e+05
44	187	0.000e+00	6.811e+03	44	192	1.397e-03	2.099e+07	44	217	3.716e-04	1.278e+07
44	229	0.000e+00	6.725e+03	44	232	0.000e+00	8.515e+03	44	234	0.000e+00	1.147e+04
44	272	4.417e-04	2.598e+07	45	53	1.199e+00	2.477e+08	45	63	0.000e+00	6.509e+03
45	65	0.000e+00	1.771e+05	45	66	6.665e-02	4.400e+08	45	67	4.958e-01	1.964e+09
45	68	5.262e-01	2.108e+09	45	69	2.203e-02	6.322e+07	45	70	2.279e-01	1.588e+09
45	72	3.828e-02	1.607e+08	45	73	1.058e+00	7.460e+09	45	74	1.135e-01	4.843e+08
45	75	1.214e-01	3.718e+08	45	77	3.669e-01	1.162e+09	45	78	6.008e-03	2.939e+07
45	81	1.359e-02	1.185e+08	45	92	0.000e+00	1.645e+05	45	93	0.000e+00	3.330e+05
45	97	0.000e+00	3.243e+04	45	101	3.020e+00	1.713e+10	45	105	0.000e+00	6.638e+05
45	109	0.000e+00	2.395e+04	45	111	3.088e-03	7.216e+07	45	112	6.262e-03	8.957e+07
45	113	1.462e-03	2.099e+07	45	114	9.871e-03	2.381e+08	45	124	3.828e-02	4.397e+08
45	125	0.000e+00	8.514e+03	45	127	6.673e-04	1.887e+07	45	135	0.000e+00	6.261e+03
45	144	0.000e+00	3.168e+05	45	147	5.750e-04	9.151e+06	45	151	0.000e+00	2.603e+03
45	152	0.000e+00	1.202e+03	45	154	0.000e+00	4.563e+05	45	155	0.000e+00	1.704e+04
45	156	6.773e-03	2.580e+08	45	179	0.000e+00	2.143e+05	45	182	0.000e+00	4.538e+03
45	183	0.000e+00	5.007e+04	45	186	0.000e+00	7.544e+03	45	187	0.000e+00	2.164e+05
45	188	0.000e+00	1.724e+05	45	196	1.679e-02	4.592e+08	45	206	3.895e-02	8.180e+08
45	207	0.000e+00	1.763e+05	45	208	1.470e-03	7.580e+07	45	224	5.208e-03	1.828e+08
45	225	2.610e-04	2.161e+07	45	233	0.000e+00	4.460e+04	45	250	4.729e-03	2.723e+08
45	261	0.000e+00	2.595e+04	45	265	0.000e+00	1.151e+04	45	275	4.931e-03	2.067e+08
45	280	0.000e+00	1.390e+04	45	281	0.000e+00	5.045e+03	46	54	2.448e-02	1.737e+07
46	55	4.417e-01	3.827e+08	46	59	3.007e-01	3.449e+08	46	67	0.000e+00	9.541e+03
46	68	0.000e+00	1.528e+04	46	74	0.000e+00	9.949e+03	46	78	0.000e+00	5.757e+03
46	91	3.968e-03	3.363e+07	46	106	5.071e-01	6.885e+09	46	125	1.396e-02	3.396e+08
46	126	9.457e-02	2.339e+09	46	130	1.426e-02	3.605e+08	46	133	8.953e-04	2.308e+07
46	136	0.000e+00	1.404e+04	46	137	0.000e+00	4.212e+05	46	140	0.000e+00	8.366e+03
46	143	0.000e+00	2.704e+04	46	148	2.443e-04	8.149e+06	46	171	5.972e-04	2.107e+07

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
46	174	4.486e-04	1.599e+07	46	210	1.964e-04	1.305e+07	47	54	1.207e-01	8.197e+07
47	55	1.544e-01	1.285e+08	47	56	9.981e-01	5.197e+08	47	58	2.597e-01	8.462e+08
47	59	4.684e-01	5.190e+08	47	60	4.547e-02	5.400e+07	47	61	2.428e-01	1.738e+08
47	62	7.930e-03	7.597e+06	47	63	3.924e-03	2.623e+07	47	66	0.000e+00	3.156e+04
47	67	0.000e+00	8.798e+03	47	69	0.000e+00	2.364e+04	47	72	0.000e+00	3.213e+03
47	74	0.000e+00	1.707e+04	47	75	0.000e+00	1.042e+04	47	78	0.000e+00	1.424e+04
47	79	0.000e+00	7.426e+03	47	90	8.425e-03	4.213e+07	47	91	2.894e-03	2.422e+07
47	92	3.467e-03	1.785e+07	47	95	2.188e-03	1.209e+07	47	97	3.646e-03	2.195e+07
47	106	3.685e-01	4.953e+09	47	107	1.116e+00	9.012e+09	47	109	3.585e-02	3.093e+08
47	115	0.000e+00	8.619e+03	47	125	5.179e-02	1.250e+09	47	126	3.043e-04	7.469e+06
47	127	0.000e+00	5.159e+03	47	128	1.890e-01	2.795e+09	47	129	4.490e-02	3.347e+09
47	130	6.348e-02	1.593e+09	47	132	1.034e-02	1.573e+08	47	133	1.001e-02	2.561e+08
47	134	8.341e-04	1.318e+07	47	136	0.000e+00	1.947e+05	47	138	0.000e+00	4.298e+05
47	139	0.000e+00	4.468e+05	47	140	0.000e+00	1.589e+05	47	141	0.000e+00	2.514e+04
47	143	0.000e+00	1.032e+05	47	145	0.000e+00	3.852e+04	47	148	2.117e-04	7.019e+06
47	149	5.714e-04	1.137e+07	47	171	1.831e-03	6.422e+07	47	173	9.055e-04	1.915e+07
47	174	3.266e-04	1.157e+07	47	207	8.614e-05	1.145e+07	47	210	1.454e-04	9.613e+06
47	211	4.486e-04	1.781e+07	48	55	1.423e-02	1.051e+07	48	56	2.009e-01	9.300e+07
48	57	1.697e+00	6.258e+08	48	59	1.392e-02	1.390e+07	48	60	8.158e-01	8.765e+08
48	61	1.066e+00	6.905e+08	48	62	1.024e-02	9.000e+06	48	64	1.760e-03	5.734e+06
48	67	0.000e+00	5.233e+03	48	68	0.000e+00	4.741e+03	48	69	0.000e+00	1.223e+04
48	70	0.000e+00	1.145e+04	48	71	0.000e+00	1.124e+04	48	72	0.000e+00	9.576e+03
48	74	0.000e+00	6.779e+03	48	75	0.000e+00	2.234e+04	48	76	0.000e+00	4.076e+04
48	78	0.000e+00	1.529e+04	48	79	0.000e+00	3.051e+04	48	80	0.000e+00	3.984e+04
48	89	1.345e-02	4.604e+07	48	90	2.713e-03	1.307e+07	48	94	3.971e-03	1.505e+07
48	106	2.499e-02	3.262e+08	48	107	3.750e-01	2.940e+09	48	108	2.106e+00	1.181e+10
48	116	0.000e+00	6.810e+03	48	117	0.000e+00	7.685e+03	48	128	9.237e-03	1.337e+08
48	130	1.964e-02	4.822e+08	48	131	2.789e-01	2.944e+09	48	132	2.072e-01	3.088e+09
48	133	1.083e-01	2.714e+09	48	134	1.070e-03	1.656e+07	48	136	0.000e+00	4.786e+03
48	137	0.000e+00	5.038e+04	48	138	0.000e+00	5.101e+04	48	139	0.000e+00	2.897e+04
48	140	0.000e+00	1.397e+05	48	141	0.000e+00	4.538e+05	48	142	0.000e+00	4.735e+05
48	143	0.000e+00	2.721e+05	48	145	0.000e+00	3.933e+05	48	146	0.000e+00	4.309e+05
48	149	3.036e-04	5.928e+06	48	150	1.414e-03	1.974e+07	48	171	3.612e-03	1.244e+08
48	172	1.665e-03	2.460e+07	48	205	0.000e+00	1.277e+04	48	211	1.562e-04	6.120e+06
48	212	8.765e-04	2.455e+07	49	70	0.000e+00	4.694e+03	49	71	0.000e+00	1.918e+04
49	79	0.000e+00	3.775e+03	49	80	0.000e+00	1.073e+04	49	82	1.064e-02	2.880e+07
49	86	6.544e-01	2.659e+09	49	87	8.172e-02	2.402e+08	49	89	1.594e-02	4.992e+07
49	90	2.544e-01	1.122e+09	49	91	6.485e-01	4.787e+09	49	95	3.714e-02	1.822e+08
49	96	1.125e-01	9.254e+08	49	98	0.000e+00	6.032e+04	49	99	0.000e+00	1.885e+04
49	102	7.520e+00	3.221e+10	49	125	8.534e-04	1.915e+07	49	126	1.332e-03	3.042e+07
49	128	3.884e-04	5.343e+06	49	130	2.351e-04	5.493e+06	49	145	0.000e+00	7.767e+03
49	146	0.000e+00	2.240e+04	49	155	2.235e-03	3.039e+07	49	157	0.000e+00	7.298e+04
49	158	2.489e-03	3.399e+07	49	164	3.693e-03	5.133e+07	49	167	0.000e+00	3.583e+04
49	173	3.260e-03	6.493e+07	49	174	1.975e-02	6.587e+08	49	176	0.000e+00	1.180e+04

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
49	177	0.000e+00	3.451e+04	49	178	0.000e+00	4.073e+03	49	180	2.741e-04	5.583e+06
49	190	0.000e+00	8.024e+04	49	191	0.000e+00	1.571e+05	49	192	0.000e+00	1.306e+04
49	193	0.000e+00	4.675e+04	49	197	0.000e+00	2.917e+05	49	199	0.000e+00	4.775e+04
49	200	0.000e+00	2.418e+05	49	202	0.000e+00	1.196e+05	49	203	0.000e+00	1.379e+04
49	204	0.000e+00	1.657e+05	49	205	0.000e+00	4.014e+05	49	230	5.501e-04	1.902e+07
49	244	0.000e+00	2.674e+03	49	258	1.159e-04	4.301e+06	49	279	2.647e-04	2.331e+07
50	70	0.000e+00	9.555e+03	50	72	0.000e+00	3.292e+03	50	78	0.000e+00	2.628e+03
50	79	0.000e+00	7.461e+03	50	82	3.001e-02	8.115e+07	50	84	7.772e-02	2.175e+08
50	86	2.457e-01	9.982e+08	50	87	7.604e-01	2.234e+09	50	88	9.523e-02	2.194e+08
50	89	3.296e-01	1.032e+09	50	90	8.473e-01	3.736e+09	50	92	8.883e-03	4.041e+07
50	93	4.388e-03	1.136e+07	50	94	3.181e-02	1.108e+08	50	95	1.045e-01	5.127e+08
50	97	9.870e-03	5.300e+07	50	98	0.000e+00	2.638e+04	50	99	0.000e+00	4.946e+04
50	100	0.000e+00	1.526e+04	50	102	6.331e-01	2.711e+09	50	103	9.877e+00	3.295e+10
50	105	1.889e-02	6.787e+07	50	128	3.067e-03	4.218e+07	50	131	4.018e-04	4.033e+06
50	132	3.094e-04	4.386e+06	50	143	0.000e+00	4.597e+03	50	145	0.000e+00	1.345e+04
50	155	7.505e-04	1.020e+07	50	157	0.000e+00	1.650e+04	50	159	1.583e-03	3.031e+07
50	160	0.000e+00	4.696e+04	50	161	4.320e-03	4.599e+07	50	163	0.000e+00	5.942e+03
50	165	5.953e-03	6.453e+07	50	168	0.000e+00	6.468e+04	50	170	0.000e+00	4.012e+03
50	172	3.145e-03	4.453e+07	50	173	2.640e-02	5.257e+08	50	175	0.000e+00	1.224e+04
50	176	0.000e+00	9.018e+03	50	177	0.000e+00	1.525e+04	50	178	0.000e+00	1.282e+04
50	180	3.427e-04	6.981e+06	50	183	9.203e-04	1.886e+07	50	190	0.000e+00	2.849e+04
50	191	0.000e+00	7.370e+04	50	192	0.000e+00	2.612e+04	50	193	0.000e+00	1.372e+05
50	194	0.000e+00	9.322e+04	50	197	0.000e+00	9.039e+04	50	198	0.000e+00	3.971e+04
50	199	0.000e+00	2.720e+05	50	200	0.000e+00	1.673e+05	50	201	0.000e+00	8.102e+04
50	202	0.000e+00	1.959e+05	50	203	0.000e+00	8.453e+04	50	204	0.000e+00	2.344e+05
50	231	7.321e-04	1.970e+07	50	245	0.000e+00	2.806e+03	50	278	3.623e-04	1.914e+07
51	57	1.435e-02	3.977e+06	51	72	0.000e+00	1.283e+04	51	78	0.000e+00	1.000e+04
51	83	1.485e-01	3.204e+08	51	84	8.386e-02	2.346e+08	51	85	1.336e-02	2.424e+07
51	87	2.843e-01	8.349e+08	51	88	1.394e+00	3.210e+09	51	89	1.238e+00	3.874e+09
51	93	1.120e-02	2.898e+07	51	94	9.883e-02	3.441e+08	51	99	0.000e+00	1.962e+04
51	100	0.000e+00	7.192e+04	51	102	9.626e-03	4.121e+07	51	103	6.255e-01	2.086e+09
51	104	1.291e+01	3.530e+10	51	105	3.561e-03	1.279e+07	51	131	4.651e-03	4.669e+07
51	143	0.000e+00	1.453e+04	51	153	3.800e-04	3.263e+06	51	155	1.730e-03	2.352e+07
51	158	3.729e-03	5.089e+07	51	160	0.000e+00	1.510e+04	51	162	0.000e+00	7.865e+03
51	166	0.000e+00	1.308e+05	51	169	1.285e-02	1.145e+08	51	170	0.000e+00	5.691e+03
51	172	3.682e-02	5.212e+08	51	175	0.000e+00	2.772e+04	51	176	0.000e+00	4.594e+03
51	178	0.000e+00	4.996e+03	51	190	0.000e+00	6.680e+03	51	192	0.000e+00	1.946e+05
51	193	0.000e+00	5.484e+04	51	194	0.000e+00	1.282e+04	51	195	0.000e+00	1.006e+05
51	198	0.000e+00	3.461e+05	51	199	0.000e+00	6.639e+04	51	201	0.000e+00	3.149e+05
51	202	0.000e+00	9.438e+04	51	203	0.000e+00	3.002e+05	51	232	9.686e-04	2.134e+07
51	246	0.000e+00	3.107e+03	51	260	1.750e-04	4.134e+06	51	277	4.999e-04	1.885e+07
52	54	3.217e-01	1.253e+08	52	55	8.172e-02	4.150e+07	52	59	3.751e-02	2.728e+07
52	60	6.384e-03	5.058e+06	52	62	1.463e+00	9.931e+08	52	63	4.163e-01	2.088e+09
52	65	2.617e-03	2.600e+07	52	67	0.000e+00	8.204e+03	52	68	0.000e+00	1.101e+04

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
52	70	0.000e+00	3.682e+03	52	73	0.000e+00	1.894e+04	52	74	0.000e+00	5.248e+03
52	75	0.000e+00	3.746e+03	52	77	0.000e+00	2.172e+04	52	81	0.000e+00	1.309e+04
52	92	1.537e-01	6.873e+08	52	97	1.121e-01	5.923e+08	52	101	0.000e+00	3.805e+04
52	106	9.932e-03	1.194e+08	52	107	2.116e-02	1.528e+08	52	109	1.585e+00	1.227e+10
52	112	0.000e+00	9.354e+03	52	124	0.000e+00	1.032e+05	52	125	8.146e-02	1.809e+09
52	126	3.387e-02	7.658e+08	52	127	0.000e+00	1.266e+05	52	130	3.657e-02	8.459e+08
52	132	1.159e-03	1.627e+07	52	133	3.899e-03	9.207e+07	52	134	1.589e-01	2.318e+09
52	135	3.467e-02	2.613e+09	52	136	0.000e+00	3.015e+05	52	137	0.000e+00	8.076e+03
52	140	0.000e+00	1.856e+05	52	143	0.000e+00	3.589e+04	52	147	0.000e+00	3.854e+05
52	156	0.000e+00	3.290e+05	52	163	0.000e+00	5.334e+03	52	176	0.000e+00	1.788e+04
52	178	0.000e+00	2.293e+04	52	187	6.677e-04	1.442e+07	52	196	0.000e+00	1.858e+04
52	206	0.000e+00	3.169e+04	52	207	3.580e-03	4.479e+08	52	208	0.000e+00	3.499e+04
52	213	6.792e-04	2.594e+07	52	224	0.000e+00	1.169e+04	52	233	4.201e-04	3.376e+07
52	238	1.045e-04	5.221e+06	52	281	1.665e-05	4.404e+06	53	62	3.209e-02	1.664e+07
53	73	0.000e+00	1.296e+04	53	81	0.000e+00	1.352e+04	53	82	3.285e-01	7.802e+08
53	84	7.054e-01	1.738e+09	53	86	1.280e-02	4.587e+07	53	87	5.986e-02	1.553e+08
53	89	1.111e-02	3.084e+07	53	90	8.100e-03	3.168e+07	53	92	8.192e-01	3.311e+09
53	93	5.124e-01	1.180e+09	53	94	2.935e-03	9.122e+06	53	97	5.385e-01	2.595e+09
53	101	0.000e+00	9.472e+04	53	103	2.291e-02	6.900e+07	53	105	1.078e+01	3.511e+10
53	109	1.351e-02	9.692e+07	53	134	5.843e-03	8.069e+07	53	144	1.881e-02	2.319e+08
53	152	3.219e-04	3.182e+06	53	155	1.104e-03	1.418e+07	53	156	0.000e+00	2.588e+04
53	157	0.000e+00	2.519e+03	53	159	1.440e-03	2.606e+07	53	160	0.000e+00	1.571e+04
53	161	3.505e-03	3.527e+07	53	162	0.000e+00	7.344e+03	53	167	0.000e+00	7.909e+03
53	168	0.000e+00	3.380e+03	53	170	0.000e+00	5.432e+04	53	173	1.310e-03	2.469e+07
53	176	0.000e+00	1.692e+04	53	178	0.000e+00	2.793e+04	53	179	8.440e-02	8.987e+08
53	180	2.555e-03	4.925e+07	53	182	1.580e-03	1.696e+07	53	183	4.276e-02	8.295e+08
53	187	1.901e-03	3.924e+07	53	188	3.694e-03	4.284e+07	53	189	0.000e+00	1.325e+05
53	196	0.000e+00	3.013e+05	53	206	0.000e+00	3.554e+05	53	208	0.000e+00	4.206e+05
53	209	0.000e+00	4.431e+05	53	213	3.051e-03	1.126e+08	53	214	0.000e+00	1.674e+04
53	226	6.915e-03	2.287e+08	53	238	6.396e-04	3.101e+07	53	242	7.608e-03	2.059e+08
53	243	0.000e+00	4.240e+04	53	261	1.287e-04	4.633e+06	53	265	2.740e-04	7.679e+06
53	280	5.840e-04	2.995e+07	53	282	0.000e+00	1.770e+04	54	66	1.045e-01	2.005e+08
54	67	6.561e-01	7.555e+08	54	68	1.114e+00	1.310e+09	54	70	5.931e-02	1.257e+08
54	71	1.789e-03	1.140e+07	54	72	1.955e-02	2.504e+07	54	73	1.056e-01	2.283e+08
54	74	4.003e-03	5.282e+06	54	79	2.633e-02	7.443e+07	54	81	3.306e-01	1.034e+09
54	97	0.000e+00	1.617e+04	54	98	2.016e-02	6.919e+07	54	110	9.705e-03	3.866e+08
54	111	2.682e-01	3.572e+09	54	112	6.946e-01	5.700e+09	54	113	1.525e-01	1.258e+09
54	114	3.246e-01	4.511e+09	54	116	2.805e-02	2.378e+08	54	118	4.918e-02	4.230e+08
54	121	4.077e-03	1.903e+08	54	122	2.031e-03	3.159e+07	54	123	9.854e-04	9.214e+06
54	125	0.000e+00	7.573e+04	54	126	0.000e+00	6.706e+04	54	127	4.670e-03	7.979e+07
54	128	0.000e+00	4.506e+04	54	132	0.000e+00	8.135e+03	54	134	0.000e+00	1.969e+05
54	136	2.438e-01	3.283e+09	54	137	1.398e-03	1.895e+07	54	138	1.546e-02	3.501e+08
54	140	1.549e-02	2.146e+08	54	143	1.353e-03	1.918e+07	54	144	0.000e+00	1.108e+04
54	145	2.508e-03	5.956e+07	54	151	0.000e+00	1.001e+05	54	155	0.000e+00	7.143e+05

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
54	156	6.307e-02	1.569e+09	54	159	0.000e+00	1.062e+05	54	164	0.000e+00	6.087e+04
54	172	0.000e+00	8.433e+03	54	173	0.000e+00	3.233e+04	54	177	2.480e-04	3.956e+06
54	180	0.000e+00	2.120e+04	54	183	0.000e+00	3.388e+05	54	186	0.000e+00	5.645e+03
54	187	0.000e+00	5.854e+04	54	214	1.795e-04	6.427e+06	54	225	2.660e-04	1.666e+07
54	250	3.632e-04	1.616e+07	54	283	2.920e-04	2.271e+07	55	66	1.004e-01	1.688e+08
55	67	2.654e-01	2.678e+08	55	68	2.061e-01	2.127e+08	55	71	3.303e-02	1.856e+08
55	73	5.887e-02	1.125e+08	55	74	1.717e+00	2.003e+09	55	78	3.625e-03	5.449e+06
55	79	1.043e-03	2.647e+06	55	80	1.306e-02	1.004e+08	55	81	5.798e-02	1.637e+08
55	98	1.481e-01	4.713e+08	55	102	0.000e+00	1.818e+04	55	110	2.547e-01	9.659e+09
55	111	2.606e-02	3.304e+08	55	112	5.364e-02	4.194e+08	55	114	9.684e-02	1.282e+09
55	115	1.716e-01	2.307e+09	55	116	7.663e-02	6.194e+08	55	118	8.947e-01	7.341e+09
55	121	2.683e-03	1.197e+08	55	122	2.331e-02	3.465e+08	55	123	7.361e-04	6.579e+06
55	125	0.000e+00	3.362e+04	55	126	0.000e+00	1.582e+05	55	127	4.906e-04	8.028e+06
55	128	0.000e+00	3.822e+04	55	130	0.000e+00	1.343e+05	55	132	0.000e+00	3.817e+03
55	133	0.000e+00	1.554e+04	55	134	0.000e+00	4.544e+04	55	136	4.448e-03	5.769e+07
55	137	1.826e-01	2.384e+09	55	138	2.813e-02	6.138e+08	55	140	1.159e-01	1.548e+09
55	145	2.938e-04	6.726e+06	55	146	1.978e-03	1.364e+08	55	151	0.000e+00	1.463e+05
55	156	1.332e-02	3.197e+08	55	158	0.000e+00	5.998e+05	55	159	0.000e+00	1.458e+05
55	164	0.000e+00	3.185e+05	55	174	0.000e+00	1.866e+04	55	177	2.015e-03	3.104e+07
55	180	0.000e+00	4.692e+03	55	183	0.000e+00	8.369e+04	55	184	0.000e+00	2.108e+04
55	187	0.000e+00	1.150e+04	55	191	5.602e-04	9.860e+06	55	204	5.845e-04	1.887e+07
55	205	2.536e-04	2.459e+07	55	218	6.771e-04	2.395e+07	55	223	3.655e-05	6.563e+06
55	247	3.383e-04	1.461e+07	55	274	7.567e-05	1.682e+07	56	66	3.189e-02	5.205e+07
56	67	2.013e-01	1.972e+08	56	69	7.749e-01	5.576e+08	56	70	7.890e-02	1.434e+08
56	72	6.990e-03	7.684e+06	56	73	1.219e-02	2.265e+07	56	74	4.674e-01	5.305e+08
56	75	1.717e+00	1.405e+09	56	77	7.548e-01	6.589e+08	56	78	1.360e-02	1.994e+07
56	79	2.533e-02	6.274e+07	56	98	3.020e-02	9.454e+07	56	99	2.425e-01	5.422e+08
56	102	0.000e+00	5.536e+03	56	103	0.000e+00	2.146e+04	56	111	4.605e-01	5.777e+09
56	112	2.030e-02	1.570e+08	56	113	8.383e-02	6.521e+08	56	114	9.128e-02	1.196e+09
56	115	4.587e-02	6.104e+08	56	116	1.313e-01	1.050e+09	56	117	1.172e-01	6.718e+08
56	118	2.757e-01	2.239e+09	56	119	1.394e+00	8.124e+09	56	122	1.784e-02	2.626e+08
56	123	2.683e-02	2.374e+08	56	124	2.187e-02	1.415e+08	56	125	0.000e+00	8.816e+04
56	128	0.000e+00	1.073e+05	56	129	0.000e+00	4.182e+05	56	130	0.000e+00	1.409e+05
56	131	0.000e+00	3.073e+04	56	132	0.000e+00	6.397e+04	56	133	0.000e+00	7.123e+04
56	134	0.000e+00	4.248e+03	56	135	0.000e+00	5.138e+03	56	136	3.003e-02	3.863e+08
56	137	8.969e-03	1.161e+08	56	138	1.090e-02	2.359e+08	56	139	2.975e-01	2.764e+09
56	140	7.829e-02	1.037e+09	56	141	1.333e-01	1.267e+09	56	145	6.485e-03	1.473e+08
56	147	1.476e-02	1.459e+08	56	151	0.000e+00	3.357e+04	56	152	0.000e+00	1.322e+05
56	155	0.000e+00	1.019e+05	56	158	0.000e+00	3.010e+04	56	159	0.000e+00	1.338e+05
56	161	0.000e+00	7.122e+05	56	163	3.669e-04	3.805e+06	56	164	0.000e+00	3.097e+05
56	165	0.000e+00	2.736e+05	56	173	0.000e+00	3.081e+04	56	174	0.000e+00	2.965e+04
56	176	2.148e-03	2.324e+07	56	177	4.044e-04	6.184e+06	56	178	1.144e-03	1.252e+07
56	179	0.000e+00	2.356e+04	56	184	0.000e+00	4.848e+03	56	185	0.000e+00	5.259e+04
56	186	0.000e+00	1.618e+04	56	193	9.790e-04	1.224e+07	56	203	9.246e-04	1.778e+07

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
56	204	7.823e-04	2.508e+07	56	218	1.181e-04	4.157e+06	56	219	1.073e-03	2.702e+07
56	222	8.612e-05	5.129e+06	56	248	5.835e-04	1.793e+07	56	273	1.450e-04	1.069e+07
57	68	1.283e-02	1.189e+07	57	69	2.458e-01	1.637e+08	57	72	1.867e-01	1.906e+08
57	74	2.391e-02	2.523e+07	57	75	5.781e-01	4.398e+08	57	76	4.486e+00	2.812e+09
57	77	9.045e-02	7.360e+07	57	78	6.039e-02	8.310e+07	57	99	2.968e-02	6.353e+07
57	100	3.450e-01	5.746e+08	57	104	0.000e+00	2.422e+04	57	112	1.455e-01	1.095e+09
57	113	6.830e-01	5.169e+09	57	116	7.056e-02	5.493e+08	57	117	2.231e-01	1.245e+09
57	118	1.405e-02	1.110e+08	57	119	3.073e-01	1.744e+09	57	120	2.195e+00	9.754e+09
57	123	7.944e-02	6.850e+08	57	128	0.000e+00	1.146e+04	57	130	0.000e+00	6.061e+04
57	131	0.000e+00	1.120e+05	57	132	0.000e+00	2.665e+05	57	133	0.000e+00	3.406e+05
57	137	2.794e-03	3.539e+07	57	139	1.508e-02	1.372e+08	57	140	7.402e-03	9.597e+07
57	141	1.688e-01	1.570e+09	57	142	6.202e-01	4.518e+09	57	143	1.831e-02	2.430e+08
57	152	0.000e+00	3.996e+03	57	153	0.000e+00	4.908e+04	57	158	0.000e+00	2.675e+04
57	161	0.000e+00	4.038e+04	57	162	8.681e-04	6.857e+06	57	164	0.000e+00	7.205e+04
57	165	0.000e+00	5.289e+05	57	169	0.000e+00	1.177e+06	57	171	0.000e+00	4.393e+03
57	172	0.000e+00	1.010e+05	57	173	0.000e+00	3.961e+04	57	175	4.669e-03	3.847e+07
57	184	0.000e+00	2.310e+04	57	186	0.000e+00	2.664e+04	57	192	1.658e-03	1.581e+07
57	203	2.517e-03	4.755e+07	57	220	1.586e-03	3.071e+07	57	221	1.748e-04	6.167e+06
57	237	0.000e+00	5.105e+03	57	249	8.650e-04	2.043e+07	57	272	2.093e-04	9.152e+06
58	66	4.960e-01	6.753e+08	58	73	1.464e-02	2.297e+07	58	79	9.944e-02	2.129e+08
58	81	2.637e-03	6.341e+06	58	111	2.592e-01	3.052e+09	58	114	8.229e-03	1.013e+08
58	115	4.676e-01	5.851e+09	58	122	2.857e-02	3.967e+08	58	127	1.209e-03	1.854e+07
58	128	0.000e+00	1.104e+05	58	132	0.000e+00	3.952e+03	58	138	7.895e-02	1.628e+09
58	145	7.147e-03	1.549e+08	58	156	6.464e-04	1.471e+07	58	159	0.000e+00	5.254e+05
58	173	0.000e+00	8.142e+04	58	180	0.000e+00	5.380e+03	58	183	0.000e+00	1.345e+04
58	200	4.217e-03	1.278e+08	58	204	2.180e-03	6.719e+07	58	208	6.690e-04	2.234e+07
58	262	2.158e-04	1.544e+07	58	267	0.000e+00	1.218e+04	58	278	0.000e+00	7.670e+03
59	66	2.600e-01	3.477e+08	59	67	5.318e-01	4.269e+08	59	68	3.346e-01	2.753e+08
59	72	1.981e-01	1.806e+08	59	73	3.576e-02	5.515e+07	59	74	1.281e-01	1.209e+08
59	78	5.262e-01	6.571e+08	59	79	4.852e-03	1.024e+07	59	80	9.893e-03	6.334e+07
59	81	1.550e-02	3.676e+07	59	110	3.260e-01	1.141e+10	59	111	3.428e-01	4.011e+09
59	112	2.325e-02	1.679e+08	59	113	4.373e-03	3.177e+07	59	114	2.205e-01	2.700e+09
59	115	1.871e-01	2.328e+09	59	116	7.504e-01	5.611e+09	59	118	7.477e-03	5.678e+07
59	121	9.468e-02	3.921e+09	59	122	1.264e-01	1.746e+09	59	123	2.187e-02	1.815e+08
59	125	0.000e+00	6.339e+04	59	126	0.000e+00	1.958e+05	59	128	0.000e+00	1.079e+05
59	130	0.000e+00	7.998e+03	59	131	0.000e+00	1.231e+04	59	132	0.000e+00	1.197e+04
59	134	0.000e+00	1.824e+04	59	136	7.894e-03	9.630e+07	59	137	1.055e-01	1.295e+09
59	138	4.690e-02	9.628e+08	59	140	6.635e-02	8.339e+08	59	143	7.905e-02	1.017e+09
59	145	2.080e-03	4.488e+07	59	146	1.385e-04	8.995e+06	59	148	0.000e+00	5.423e+03
59	151	0.000e+00	2.790e+03	59	155	0.000e+00	2.449e+04	59	156	4.385e-03	9.931e+07
59	158	0.000e+00	4.190e+05	59	159	0.000e+00	3.511e+05	59	164	0.000e+00	2.291e+05
59	172	0.000e+00	3.334e+05	59	174	0.000e+00	3.129e+04	59	181	0.000e+00	9.246e+03
59	183	0.000e+00	4.602e+04	59	200	1.657e-03	5.001e+07	59	202	6.266e-03	1.136e+08
59	203	2.854e-03	5.255e+07	59	204	1.184e-03	3.636e+07	59	205	1.840e-03	1.697e+08

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
59	263	2.815e-04	1.206e+07	59	267	0.000e+00	8.809e+03	59	268	0.000e+00	1.205e+04
59	273	4.145e-04	2.971e+07	59	274	2.081e-04	4.475e+07	59	277	0.000e+00	1.713e+04
60	66	2.509e-02	3.143e+07	60	67	4.546e-02	3.419e+07	60	68	6.423e-02	4.955e+07
60	70	3.462e-01	4.903e+08	60	71	1.565e-01	6.663e+08	60	72	4.183e-01	3.586e+08
60	73	6.271e-02	9.102e+07	60	74	1.518e-02	1.349e+07	60	78	3.256e-01	3.859e+08
60	79	5.938e-01	1.190e+09	60	80	3.047e-01	1.853e+09	60	81	1.977e-02	4.466e+07
60	110	1.437e-03	4.919e+07	60	111	5.763e-02	6.598e+08	60	112	1.840e-01	1.300e+09
60	113	9.340e-01	6.641e+09	60	114	2.120e-02	2.540e+08	60	115	1.057e-01	1.287e+09
60	116	2.313e-01	1.694e+09	60	118	9.099e-03	6.767e+07	60	121	9.853e-03	3.999e+08
60	122	6.164e-02	8.341e+08	60	123	2.196e-01	1.786e+09	60	127	4.358e-04	6.520e+06
60	128	0.000e+00	1.069e+04	60	130	0.000e+00	6.633e+03	60	131	0.000e+00	1.601e+05
60	132	0.000e+00	3.190e+04	60	137	5.575e-03	6.733e+07	60	138	2.079e-03	4.197e+07
60	140	5.211e-03	6.443e+07	60	143	1.358e-01	1.720e+09	60	145	1.542e-01	3.273e+09
60	146	6.627e-02	4.237e+09	60	151	0.000e+00	1.148e+03	60	156	2.356e-03	5.253e+07
60	158	0.000e+00	3.953e+04	60	159	0.000e+00	2.778e+04	60	164	0.000e+00	2.874e+04
60	172	0.000e+00	2.592e+05	60	173	0.000e+00	6.508e+05	60	174	0.000e+00	1.031e+06
60	180	0.000e+00	2.929e+04	60	181	0.000e+00	1.441e+04	60	183	0.000e+00	1.302e+04
60	200	6.039e-04	1.798e+07	60	202	2.320e-03	4.148e+07	60	204	1.227e-03	3.715e+07
60	205	1.111e-03	1.011e+08	60	210	0.000e+00	5.855e+03	60	211	0.000e+00	6.236e+03
60	212	0.000e+00	7.075e+03	60	268	0.000e+00	4.188e+03	60	272	8.753e-04	3.730e+07
60	273	2.320e-04	1.648e+07	60	274	5.117e-05	1.091e+07	60	278	0.000e+00	1.472e+04
60	279	0.000e+00	2.798e+04	61	66	6.559e-03	8.180e+06	61	67	4.569e-02	3.421e+07
61	68	1.551e-01	1.192e+08	61	69	1.455e+00	8.032e+08	61	70	8.265e-02	1.166e+08
61	72	2.666e-01	2.276e+08	61	74	4.927e-02	4.362e+07	61	75	2.754e-01	1.759e+08
61	77	4.100e-02	2.818e+07	61	78	4.921e-01	5.811e+08	61	79	1.826e-01	3.646e+08
61	111	2.317e-01	2.649e+09	61	112	2.667e-01	1.883e+09	61	113	7.252e-01	5.149e+09
61	114	2.459e-02	2.943e+08	61	115	1.612e-02	1.960e+08	61	116	3.642e-01	2.662e+09
61	117	1.964e+00	1.029e+10	61	118	6.512e-03	4.836e+07	61	119	3.660e-02	1.952e+08
61	122	5.103e-02	6.896e+08	61	123	8.580e-02	6.970e+08	61	124	2.152e-02	1.280e+08
61	125	0.000e+00	4.185e+04	61	127	7.980e-04	1.192e+07	61	128	0.000e+00	8.016e+04
61	129	0.000e+00	9.397e+04	61	130	0.000e+00	7.539e+04	61	131	0.000e+00	1.926e+05
61	132	0.000e+00	1.191e+05	61	133	0.000e+00	2.542e+04	61	136	2.089e-03	2.504e+07
61	137	1.219e-02	1.471e+08	61	138	1.054e-03	2.127e+07	61	139	1.273e-01	1.102e+09
61	140	2.066e-02	2.552e+08	61	141	1.508e-01	1.337e+09	61	143	1.036e-01	1.311e+09
61	145	3.207e-02	6.802e+08	61	150	0.000e+00	5.853e+03	61	151	0.000e+00	4.096e+03
61	152	0.000e+00	8.506e+03	61	155	0.000e+00	1.400e+04	61	158	0.000e+00	6.010e+04
61	159	0.000e+00	1.617e+04	61	161	0.000e+00	4.044e+05	61	164	0.000e+00	1.159e+05
61	165	0.000e+00	4.028e+05	61	172	0.000e+00	5.080e+05	61	173	0.000e+00	4.128e+05
61	174	0.000e+00	1.643e+05	61	180	0.000e+00	1.327e+04	61	181	0.000e+00	2.837e+04
61	182	0.000e+00	4.099e+04	61	201	1.542e-02	1.967e+08	61	202	2.337e-03	4.175e+07
61	203	9.647e-03	1.751e+08	61	204	3.880e-03	1.174e+08	61	264	7.402e-04	2.244e+07
61	265	0.000e+00	6.867e+03	61	268	0.000e+00	7.602e+03	61	269	0.000e+00	1.646e+04
61	272	3.384e-04	1.441e+07	61	277	0.000e+00	1.512e+04	61	278	0.000e+00	1.437e+04
61	279	0.000e+00	6.286e+03	62	66	7.620e-03	6.812e+06	62	67	1.059e-01	5.684e+07

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
62	68	9.219e-02	5.100e+07	62	69	2.517e-02	1.002e+07	62	70	1.364e-02	1.409e+07
62	72	2.308e-02	1.445e+07	62	73	7.931e-02	8.430e+07	62	74	3.059e-02	1.999e+07
62	75	5.490e-01	2.593e+08	62	77	1.869e+00	9.609e+08	62	78	1.549e-02	1.410e+07
62	81	8.866e-02	1.566e+08	62	101	2.308e-01	4.012e+08	62	105	0.000e+00	3.273e+04
62	111	8.289e-02	8.540e+08	62	112	3.612e-01	2.301e+09	62	113	1.649e-01	1.057e+09
62	114	6.228e-01	6.733e+09	62	115	6.120e-03	6.730e+07	62	116	1.002e-02	6.625e+07
62	117	6.099e-03	2.890e+07	62	118	1.254e-03	8.425e+06	62	119	1.701e-02	8.212e+07
62	123	4.385e-03	3.238e+07	62	124	2.644e+00	1.431e+10	62	125	0.000e+00	1.947e+05
62	126	0.000e+00	8.056e+04	62	127	6.653e-02	9.078e+08	62	130	0.000e+00	8.067e+04
62	132	0.000e+00	5.410e+03	62	133	0.000e+00	5.441e+03	62	134	0.000e+00	1.585e+05
62	135	0.000e+00	4.100e+05	62	136	6.222e-02	6.897e+08	62	137	2.519e-03	2.811e+07
62	138	4.025e-04	7.512e+06	62	140	2.279e-02	2.606e+08	62	141	4.239e-03	3.479e+07
62	143	9.485e-03	1.112e+08	62	144	0.000e+00	4.267e+04	62	147	2.482e-01	2.126e+09
62	151	0.000e+00	1.025e+04	62	154	0.000e+00	6.835e+04	62	155	0.000e+00	2.383e+05
62	156	1.521e-02	3.147e+08	62	158	0.000e+00	2.184e+04	62	164	0.000e+00	1.026e+05
62	165	0.000e+00	1.213e+04	62	172	0.000e+00	5.236e+04	62	179	0.000e+00	1.049e+06
62	180	0.000e+00	5.942e+03	62	182	0.000e+00	2.797e+04	62	183	0.000e+00	7.855e+04
62	188	0.000e+00	9.456e+04	62	196	1.740e-02	2.745e+08	62	206	4.278e-02	5.300e+08
62	207	0.000e+00	9.027e+04	62	208	3.968e-03	1.226e+08	62	214	5.108e-04	1.627e+07
62	224	8.237e-04	1.947e+07	62	226	0.000e+00	7.137e+03	62	242	0.000e+00	8.495e+03
62	250	1.745e-03	6.993e+07	62	261	0.000e+00	2.810e+04	62	265	0.000e+00	3.305e+04
62	269	0.000e+00	9.900e+03	62	275	2.762e-03	8.087e+07	62	280	0.000e+00	1.744e+04
62	281	0.000e+00	2.550e+04	63	66	1.696e-02	8.698e+06	63	70	9.808e-02	6.075e+07
63	73	4.649e-01	2.988e+08	63	81	9.232e-02	1.117e+08	63	92	0.000e+00	5.826e+03
63	111	1.212e-01	1.077e+09	63	114	6.621e-01	6.194e+09	63	115	2.332e-02	2.222e+08
63	122	1.587e-03	1.703e+07	63	127	1.922e-01	2.307e+09	63	134	0.000e+00	7.544e+04
63	145	2.381e-04	4.209e+06	63	156	7.389e-02	1.378e+09	63	173	0.000e+00	8.703e+03
63	180	0.000e+00	2.539e+04	63	183	0.000e+00	4.880e+05	63	208	6.099e-02	1.731e+09
63	213	0.000e+00	9.652e+04	63	225	5.310e-04	2.788e+07	63	238	0.000e+00	1.001e+04
63	280	0.000e+00	1.379e+05	63	283	6.719e-03	4.463e+08	64	70	4.690e-01	8.342e+07
64	71	2.106e-01	1.130e+08	64	72	9.199e-01	1.006e+08	64	73	1.365e-01	2.600e+07
64	78	7.871e-01	1.917e+08	64	79	4.063e-01	1.702e+08	64	80	1.295e-01	1.668e+08
64	81	7.734e-03	4.174e+06	64	110	1.354e-01	2.767e+09	64	111	3.197e-01	2.186e+09
64	112	1.105e-01	4.705e+08	64	113	5.052e-01	2.168e+09	64	114	7.693e-02	5.581e+08
64	116	6.419e-03	2.859e+07	64	121	2.668e-02	6.779e+08	64	122	9.190e-02	7.784e+08
64	123	2.045e-01	1.042e+09	64	127	9.037e-04	8.681e+06	64	143	1.822e-03	1.600e+07
64	145	1.300e-03	1.916e+07	64	146	4.955e-04	2.201e+07	64	172	0.000e+00	8.648e+03
64	173	0.000e+00	9.271e+03	64	174	0.000e+00	1.056e+04	64	210	0.000e+00	3.022e+05
64	211	0.000e+00	3.019e+05	64	212	0.000e+00	3.041e+05	65	73	1.884e-01	1.423e+07
65	79	1.114e-02	2.626e+06	65	81	4.881e-01	1.603e+08	65	111	3.541e-02	2.132e+08
65	114	1.128e-01	7.234e+08	65	115	2.736e-03	1.793e+07	65	127	3.630e-01	3.133e+09
65	134	0.000e+00	5.343e+03	65	156	1.232e-03	1.772e+07	65	180	0.000e+00	4.868e+03
65	183	0.000e+00	8.637e+04	65	208	1.301e-02	2.998e+08	65	213	0.000e+00	3.269e+05
65	238	0.000e+00	6.468e+03	65	280	0.000e+00	1.932e+04	65	283	1.329e-03	7.720e+07

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
66	86	5.949e-01	1.156e+08	66	90	3.380e-02	9.321e+06	66	92	5.356e-02	1.668e+07
66	96	4.566e-02	3.181e+07	66	106	3.714e-03	7.887e+06	66	107	7.156e-03	9.144e+06
66	111	0.000e+00	2.392e+04	66	122	0.000e+00	4.787e+03	66	125	2.093e-01	1.530e+09
66	126	4.450e-03	3.354e+07	66	128	1.512e-02	6.887e+07	66	129	3.025e-01	6.993e+09
66	130	1.208e-01	9.471e+08	66	134	2.779e-02	1.424e+08	66	135	7.254e-03	1.962e+08
66	136	0.000e+00	2.894e+04	66	138	0.000e+00	3.857e+04	66	140	0.000e+00	3.012e+04
66	141	0.000e+00	6.978e+03	66	143	0.000e+00	5.246e+03	66	145	0.000e+00	2.551e+04
66	148	4.681e-01	5.894e+09	66	149	7.246e-02	5.477e+08	66	154	1.237e-02	1.589e+08
66	159	1.301e+00	1.021e+10	66	163	0.000e+00	7.135e+05	66	171	4.137e-03	5.703e+07
66	173	4.296e-02	3.583e+08	66	174	6.706e-02	9.391e+08	66	177	0.000e+00	7.213e+04
66	178	0.000e+00	1.415e+04	66	180	7.665e-01	6.618e+09	66	183	4.296e-02	3.744e+08
66	184	1.389e-02	2.198e+08	66	185	5.848e-02	2.776e+09	66	186	1.107e-03	1.051e+07
66	187	5.572e-03	5.324e+07	66	197	0.000e+00	2.110e+04	66	207	1.657e-03	9.839e+07
66	210	6.774e-04	2.376e+07	66	214	0.000e+00	8.062e+03	66	224	0.000e+00	6.030e+03
66	225	0.000e+00	1.093e+04	66	227	5.654e-04	2.719e+07	66	239	1.214e-03	1.846e+08
66	240	5.890e-04	2.985e+07	66	267	5.774e-04	1.845e+07	66	278	2.138e-04	6.926e+06
66	279	1.017e-04	5.496e+06	66	281	5.536e-05	9.047e+06	67	84	5.081e-01	5.935e+07
67	87	2.926e-01	4.293e+07	67	89	7.597e-02	1.459e+07	67	95	3.860e-02	1.580e+07
67	97	8.000e-02	4.409e+07	67	108	1.304e-02	1.195e+07	67	110	0.000e+00	3.661e+04
67	111	0.000e+00	1.853e+04	67	114	0.000e+00	7.153e+03	67	121	0.000e+00	6.296e+03
67	125	1.796e-01	1.312e+09	67	126	4.815e-01	3.628e+09	67	127	0.000e+00	1.986e+04
67	128	2.293e-01	1.044e+09	67	130	1.310e-01	1.027e+09	67	131	6.773e-03	2.286e+07
67	132	9.390e-03	4.504e+07	67	133	1.718e-03	1.395e+07	67	134	8.918e-02	4.569e+08
67	136	0.000e+00	1.523e+04	67	137	0.000e+00	4.741e+04	67	138	0.000e+00	2.902e+04
67	139	0.000e+00	8.777e+03	67	140	0.000e+00	5.016e+03	67	141	0.000e+00	1.908e+04
67	142	0.000e+00	2.517e+03	67	143	0.000e+00	1.234e+04	67	144	3.706e-01	1.932e+09
67	146	0.000e+00	2.702e+04	67	147	0.000e+00	9.023e+03	67	148	6.968e-02	8.772e+08
67	149	4.397e-01	3.323e+09	67	150	4.007e-03	2.167e+07	67	151	1.643e-02	8.950e+07
67	154	8.940e-02	1.149e+09	67	155	1.340e+00	7.438e+09	67	156	0.000e+00	2.431e+04
67	157	0.000e+00	6.434e+03	67	158	1.228e+00	6.860e+09	67	159	1.321e-01	1.037e+09
67	162	0.000e+00	8.108e+05	67	163	0.000e+00	1.221e+05	67	171	1.893e-02	2.609e+08
67	172	4.031e-03	2.384e+07	67	173	2.340e-02	1.951e+08	67	174	1.209e-02	1.693e+08
67	177	0.000e+00	2.833e+04	67	178	0.000e+00	9.715e+04	67	180	1.427e-01	1.232e+09
67	181	6.592e-01	4.069e+09	67	183	1.150e-01	1.002e+09	67	184	9.521e-02	1.506e+09
67	186	1.833e-02	1.741e+08	67	187	1.724e-01	1.647e+09	67	189	0.000e+00	4.021e+04
67	211	7.233e-04	1.523e+07	67	213	7.742e-04	1.655e+07	67	216	0.000e+00	5.731e+03
67	217	0.000e+00	5.954e+03	67	220	0.000e+00	1.160e+04	67	221	0.000e+00	5.999e+03
67	222	0.000e+00	5.542e+03	67	223	0.000e+00	4.777e+03	67	228	4.887e-04	1.410e+07
67	233	5.865e-04	2.837e+07	67	238	1.254e-03	3.808e+07	67	240	1.684e-03	8.536e+07
67	241	3.516e-04	1.070e+07	67	261	5.859e-04	1.335e+07	67	268	4.926e-04	1.124e+07
67	277	3.772e-04	8.725e+06	67	280	4.131e-04	1.346e+07	68	82	4.303e-01	3.976e+07
68	87	3.888e-01	5.428e+07	68	95	4.402e-02	1.740e+07	68	97	7.708e-02	4.122e+07
68	102	2.369e-02	1.259e+07	68	107	5.955e-03	7.457e+06	68	110	0.000e+00	5.660e+04
68	111	0.000e+00	5.972e+03	68	114	0.000e+00	1.547e+04	68	121	0.000e+00	1.058e+04

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
68	125	4.559e-01	3.297e+09	68	126	8.311e-02	6.197e+08	68	127	0.000e+00	2.238e+04
68	130	1.729e-01	1.342e+09	68	131	1.078e-02	3.603e+07	68	132	1.013e-01	4.809e+08
68	133	6.214e-03	4.996e+07	68	134	1.305e-01	6.619e+08	68	136	0.000e+00	3.668e+04
68	137	0.000e+00	5.609e+04	68	139	0.000e+00	4.954e+03	68	141	0.000e+00	6.128e+03
68	142	0.000e+00	2.422e+03	68	143	0.000e+00	1.360e+04	68	144	4.328e-01	2.237e+09
68	145	0.000e+00	9.078e+03	68	146	0.000e+00	2.830e+04	68	147	0.000e+00	1.705e+04
68	148	1.099e-01	1.372e+09	68	149	2.292e-01	1.718e+09	68	150	4.662e-02	2.500e+08
68	151	5.903e-02	3.189e+08	68	154	7.004e-02	8.928e+08	68	155	1.740e+00	9.584e+09
68	156	0.000e+00	3.010e+04	68	157	0.000e+00	4.953e+05	68	158	9.304e-01	5.156e+09
68	159	8.481e-03	6.603e+07	68	162	0.000e+00	5.580e+03	68	164	2.885e-01	1.644e+09
68	167	0.000e+00	3.390e+05	68	172	3.139e-02	1.842e+08	68	173	9.843e-02	8.144e+08
68	174	1.578e-02	2.192e+08	68	175	0.000e+00	1.035e+04	68	176	0.000e+00	1.734e+05
68	177	0.000e+00	2.514e+04	68	178	0.000e+00	1.154e+04	68	180	1.468e-01	1.258e+09
68	181	4.335e-01	2.656e+09	68	183	2.633e-01	2.277e+09	68	184	3.543e-02	5.564e+08
68	186	3.380e-02	3.187e+08	68	187	1.736e-01	1.647e+09	68	189	0.000e+00	5.142e+04
68	190	0.000e+00	1.877e+04	68	206	0.000e+00	1.870e+04	68	210	4.933e-04	1.722e+07
68	213	9.629e-04	2.048e+07	68	227	4.285e-04	2.052e+07	68	233	4.662e-04	2.246e+07
68	238	1.932e-03	5.842e+07	68	240	9.618e-04	4.854e+07	68	244	0.000e+00	3.817e+03
68	258	3.693e-04	8.335e+06	68	261	5.859e-04	1.329e+07	68	268	3.530e-04	8.024e+06
68	278	1.865e-04	6.019e+06	68	280	3.970e-04	1.288e+07	69	83	3.369e-01	2.735e+07
69	88	8.590e-01	9.560e+07	69	89	1.096e-01	1.993e+07	69	94	9.486e-02	2.599e+07
69	103	1.887e-02	7.782e+06	69	105	3.995e-02	2.021e+07	69	108	1.980e-02	1.770e+07
69	111	0.000e+00	4.054e+04	69	113	0.000e+00	1.145e+04	69	122	0.000e+00	8.263e+03
69	128	5.881e-01	2.642e+09	69	131	2.348e-01	7.825e+08	69	132	4.775e-01	2.261e+09
69	136	0.000e+00	2.205e+04	69	139	0.000e+00	9.285e+04	69	142	0.000e+00	2.722e+04
69	143	0.000e+00	5.576e+04	69	144	8.043e-02	4.149e+08	69	145	0.000e+00	3.546e+04
69	149	1.812e-01	1.356e+09	69	150	9.468e-01	5.068e+09	69	151	3.100e-03	1.672e+07
69	152	7.890e-04	3.319e+06	69	155	9.933e-02	5.460e+08	69	157	0.000e+00	3.888e+04
69	158	5.973e-03	3.303e+07	69	159	1.504e-03	1.169e+07	69	160	0.000e+00	5.610e+05
69	161	2.862e+00	1.237e+10	69	165	1.860e-01	8.265e+08	69	167	0.000e+00	2.312e+04
69	168	0.000e+00	2.782e+05	69	170	0.000e+00	8.667e+04	69	172	2.928e-01	1.715e+09
69	173	3.246e-02	2.681e+08	69	175	0.000e+00	2.036e+05	69	176	0.000e+00	3.667e+04
69	177	0.000e+00	5.578e+03	69	178	0.000e+00	1.759e+04	69	179	3.670e-02	1.728e+08
69	180	1.978e-02	1.692e+08	69	181	3.530e-01	2.159e+09	69	182	1.566e+00	7.464e+09
69	186	1.372e-01	1.291e+09	69	187	1.860e-03	1.761e+07	69	188	9.857e-02	5.271e+08
69	190	0.000e+00	4.529e+03	69	194	0.000e+00	1.552e+04	69	198	0.000e+00	2.924e+04
69	211	7.283e-04	1.524e+07	69	212	1.342e-03	2.008e+07	69	228	4.944e-04	1.419e+07
69	229	1.109e-03	2.275e+07	69	238	8.775e-04	2.651e+07	69	241	3.209e-03	9.714e+07
69	245	0.000e+00	2.564e+03	69	256	0.000e+00	1.237e+04	69	265	3.932e-04	6.937e+06
69	269	7.830e-04	1.383e+07	69	277	5.428e-04	1.249e+07	70	90	1.062e+00	2.349e+08
70	91	3.982e-01	1.495e+08	70	92	2.672e-01	6.766e+07	70	95	3.612e-01	1.237e+08
70	96	6.070e-02	3.542e+07	70	106	1.536e-02	2.952e+07	70	107	2.729e-02	3.157e+07
70	109	1.426e-02	1.958e+07	70	125	2.980e-01	2.065e+09	70	126	1.547e-02	1.107e+08
70	128	2.437e-01	1.053e+09	70	129	1.431e-01	3.143e+09	70	130	7.981e-02	5.945e+08

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
70	132	6.197e-01	2.827e+09	70	133	4.564e-01	3.526e+09	70	134	1.435e-01	7.003e+08
70	135	4.759e-02	1.227e+09	70	136	0.000e+00	3.071e+03	70	140	0.000e+00	7.798e+03
70	141	0.000e+00	7.157e+03	70	143	0.000e+00	4.393e+03	70	145	0.000e+00	1.627e+04
70	148	5.076e-04	6.139e+06	70	149	9.739e-02	7.070e+08	70	154	3.323e-02	4.103e+08
70	156	0.000e+00	5.527e+03	70	159	1.176e-02	8.872e+07	70	163	0.000e+00	5.803e+03
70	171	2.457e-02	3.259e+08	70	173	3.074e-01	2.467e+09	70	174	1.615e-01	2.176e+09
70	176	0.000e+00	1.454e+05	70	177	0.000e+00	1.265e+05	70	180	5.057e-02	4.205e+08
70	183	7.768e-02	6.521e+08	70	184	2.823e-02	4.308e+08	70	185	9.509e-03	4.354e+08
70	186	3.689e-02	3.380e+08	70	187	6.567e-03	6.055e+07	70	191	0.000e+00	1.052e+04
70	207	1.195e-03	6.867e+07	70	211	3.383e-04	6.955e+06	70	214	0.000e+00	5.852e+04
70	215	0.000e+00	1.574e+05	70	216	0.000e+00	1.341e+04	70	217	0.000e+00	9.449e+04
70	218	0.000e+00	8.727e+04	70	219	0.000e+00	1.057e+05	70	221	0.000e+00	7.912e+04
70	222	0.000e+00	5.240e+04	70	224	0.000e+00	2.832e+04	70	225	0.000e+00	4.848e+04
70	240	3.284e-04	1.631e+07	70	241	2.921e-04	8.710e+06	70	278	3.911e-04	1.243e+07
70	279	2.436e-04	1.291e+07	70	280	1.384e-04	4.424e+06	71	91	6.061e-01	2.267e+08
71	96	1.635e-01	9.506e+07	71	106	1.795e-02	3.444e+07	71	125	8.623e-02	5.972e+08
71	126	7.315e-02	5.228e+08	71	130	2.389e-01	1.778e+09	71	133	3.154e-01	2.434e+09
71	143	0.000e+00	6.997e+03	71	148	2.553e-02	3.085e+08	71	171	9.746e-03	1.292e+08
71	174	1.552e-01	2.090e+09	71	177	0.000e+00	8.504e+04	71	184	2.509e-02	3.826e+08
71	216	0.000e+00	1.159e+05	71	218	0.000e+00	9.924e+04	71	221	0.000e+00	4.742e+04
71	240	1.931e-04	9.589e+06	71	279	2.303e-04	1.220e+07	72	89	2.046e+00	3.092e+08
72	90	4.510e-01	9.802e+07	72	91	3.491e-02	1.288e+07	72	94	8.280e-01	1.953e+08
72	95	8.634e-02	2.915e+07	72	107	1.820e-02	2.089e+07	72	108	6.350e-02	5.232e+07
72	126	1.257e-01	8.956e+08	72	128	3.576e-01	1.540e+09	72	130	3.701e-01	2.746e+09
72	131	1.201e+00	3.837e+09	72	132	7.660e-01	3.480e+09	72	133	4.176e-01	3.213e+09
72	134	1.029e-01	5.001e+08	72	139	0.000e+00	5.553e+03	72	140	0.000e+00	6.216e+03
72	141	0.000e+00	1.134e+04	72	142	0.000e+00	2.647e+03	72	144	2.526e-02	1.260e+08
72	145	0.000e+00	2.009e+04	72	146	0.000e+00	5.247e+04	72	148	1.075e-03	1.296e+07
72	150	1.923e-01	9.960e+08	72	151	9.722e-04	5.072e+06	72	154	4.691e-03	5.775e+07
72	155	1.533e-02	8.159e+07	72	158	2.353e-03	1.260e+07	72	162	0.000e+00	5.664e+03
72	171	6.338e-02	8.382e+08	72	172	7.675e-01	4.355e+09	72	173	1.919e-01	1.536e+09
72	174	1.920e-02	2.580e+08	72	175	0.000e+00	2.138e+05	72	176	0.000e+00	4.796e+04
72	177	0.000e+00	3.336e+04	72	178	0.000e+00	7.756e+04	72	180	2.549e-02	2.113e+08
72	181	9.664e-02	5.730e+08	72	183	2.387e-02	1.998e+08	72	184	1.671e-02	2.543e+08
72	186	1.148e-01	1.049e+09	72	187	3.055e-02	2.809e+08	72	192	0.000e+00	1.363e+04
72	193	0.000e+00	8.792e+03	72	212	5.542e-04	8.133e+06	72	215	0.000e+00	5.023e+04
72	216	0.000e+00	1.126e+05	72	217	0.000e+00	1.230e+05	72	218	0.000e+00	2.761e+04
72	219	0.000e+00	1.090e+05	72	220	0.000e+00	2.275e+05	72	221	0.000e+00	8.548e+04
72	222	0.000e+00	1.803e+05	72	223	0.000e+00	2.363e+05	72	234	3.518e-04	1.691e+07
72	241	1.262e-03	3.757e+07	72	277	9.817e-04	2.224e+07	72	278	3.027e-04	9.605e+06
73	90	1.638e-01	3.449e+07	73	91	8.085e-02	2.892e+07	73	92	1.799e+00	4.351e+08
73	95	6.505e-02	2.142e+07	73	96	3.412e-02	1.915e+07	73	107	8.397e-03	9.509e+06
73	109	6.669e-02	8.976e+07	73	114	0.000e+00	9.759e+03	73	125	2.405e-01	1.649e+09
73	126	3.372e-01	2.386e+09	73	128	1.500e-01	6.414e+08	73	129	3.548e-02	7.706e+08

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
73	130	1.347e-01	9.923e+08	73	132	6.319e-02	2.851e+08	73	133	1.947e-01	1.488e+09
73	134	5.895e-01	2.846e+09	73	135	4.061e-01	1.037e+10	73	136	0.000e+00	1.177e+04
73	140	0.000e+00	1.118e+04	73	143	0.000e+00	7.064e+03	73	148	1.384e-02	1.660e+08
73	149	3.878e-03	2.791e+07	73	154	1.420e-01	1.739e+09	73	156	0.000e+00	2.185e+04
73	159	9.872e-03	7.386e+07	73	171	7.048e-03	9.273e+07	73	173	2.408e-02	1.917e+08
73	174	1.173e-02	1.569e+08	73	176	0.000e+00	2.620e+04	73	177	0.000e+00	7.441e+03
73	178	0.000e+00	2.013e+05	73	180	3.912e-03	3.227e+07	73	183	4.369e-01	3.639e+09
73	184	1.697e-03	2.571e+07	73	185	8.978e-03	4.080e+08	73	187	6.857e-02	6.274e+08
73	207	4.705e-03	2.686e+08	73	214	0.000e+00	1.548e+05	73	215	0.000e+00	3.558e+04
73	217	0.000e+00	2.115e+04	73	218	0.000e+00	4.389e+04	73	219	0.000e+00	2.821e+04
73	221	0.000e+00	3.131e+04	73	222	0.000e+00	6.561e+03	73	224	0.000e+00	1.566e+05
73	225	0.000e+00	2.843e+05	73	233	4.656e-04	2.197e+07	73	238	2.715e-04	8.048e+06
73	239	1.076e-04	1.596e+07	73	280	8.632e-04	2.748e+07	73	281	4.337e-05	6.925e+06
74	82	2.022e-01	1.258e+07	74	84	2.821e-01	2.177e+07	74	87	1.605e-01	1.634e+07
74	96	3.772e-02	2.047e+07	74	97	2.250e-02	1.000e+07	74	102	1.569e-01	7.135e+07
74	106	5.075e-03	9.377e+06	74	110	0.000e+00	2.691e+04	74	111	0.000e+00	9.217e+03
74	114	0.000e+00	1.495e+04	74	121	0.000e+00	6.665e+03	74	122	0.000e+00	4.805e+03
74	125	5.652e-02	3.838e+08	74	126	3.394e-01	2.378e+09	74	127	0.000e+00	5.000e+03
74	128	1.397e-01	5.918e+08	74	130	2.255e-01	1.647e+09	74	131	9.424e-03	2.964e+07
74	132	5.978e-02	2.673e+08	74	133	1.517e-03	1.149e+07	74	134	4.786e-02	2.291e+08
74	136	0.000e+00	2.832e+03	74	137	0.000e+00	5.035e+04	74	138	0.000e+00	6.225e+04
74	139	0.000e+00	1.450e+04	74	140	0.000e+00	2.115e+04	74	141	0.000e+00	1.888e+04
74	142	0.000e+00	3.051e+03	74	143	0.000e+00	5.598e+03	74	144	9.489e-02	4.673e+08
74	146	0.000e+00	2.860e+04	74	147	0.000e+00	1.243e+04	74	148	4.349e-03	5.177e+07
74	149	7.224e-02	5.163e+08	74	150	1.116e-02	5.707e+07	74	151	1.479e-01	7.622e+08
74	154	1.779e-02	2.163e+08	74	155	4.316e-01	2.268e+09	74	156	0.000e+00	1.331e+04
74	157	0.000e+00	2.940e+05	74	158	1.013e+00	5.354e+09	74	159	3.981e-01	2.958e+09
74	162	0.000e+00	2.725e+04	74	163	0.000e+00	1.254e+05	74	164	2.430e+00	1.323e+10
74	167	0.000e+00	3.457e+05	74	172	2.494e-02	1.398e+08	74	173	1.183e-01	9.353e+08
74	174	4.731e-03	6.283e+07	74	175	0.000e+00	5.665e+03	74	176	0.000e+00	7.448e+04
74	177	0.000e+00	2.376e+04	74	178	0.000e+00	1.195e+04	74	180	1.721e-01	1.410e+09
74	181	2.544e-01	1.491e+09	74	183	2.967e-02	2.454e+08	74	184	4.938e-03	7.431e+07
74	186	5.450e-03	4.924e+07	74	187	3.434e-02	3.122e+08	74	190	0.000e+00	1.950e+05
74	192	0.000e+00	9.139e+03	74	210	7.165e-04	2.431e+07	74	211	4.496e-04	9.159e+06
74	227	3.307e-04	1.546e+07	74	228	2.731e-04	7.661e+06	74	233	1.658e-04	7.796e+06
74	238	4.034e-04	1.192e+07	74	240	1.482e-04	7.304e+06	74	244	0.000e+00	2.480e+04
74	247	0.000e+00	5.987e+03	74	258	1.216e-03	2.681e+07	74	261	2.581e-04	5.723e+06
74	267	1.880e-04	5.846e+06	75	83	4.414e-01	2.445e+07	75	88	2.415e-01	1.948e+07
75	93	2.186e-01	3.072e+07	75	95	4.329e-02	1.354e+07	75	103	1.690e-01	5.935e+07
75	105	2.083e-01	9.115e+07	75	107	6.902e-03	7.604e+06	75	111	0.000e+00	1.867e+04
75	113	0.000e+00	1.726e+04	75	123	0.000e+00	6.140e+03	75	128	4.711e-01	1.986e+09
75	131	2.701e-01	8.457e+08	75	132	2.436e-01	1.084e+09	75	134	2.041e-01	9.724e+08
75	136	0.000e+00	4.016e+04	75	137	0.000e+00	9.304e+03	75	138	0.000e+00	1.766e+04
75	139	0.000e+00	3.240e+04	75	140	0.000e+00	1.978e+04	75	141	0.000e+00	1.349e+04

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
75	142	0.000e+00	4.272e+04	75	143	0.000e+00	2.040e+04	75	144	2.539e-01	1.246e+09
75	145	0.000e+00	2.833e+04	75	147	0.000e+00	1.913e+04	75	149	1.258e-03	8.955e+06
75	150	2.260e-01	1.151e+09	75	151	1.765e-02	9.060e+07	75	152	2.998e-01	1.201e+09
75	155	2.529e-01	1.324e+09	75	156	0.000e+00	5.593e+03	75	157	0.000e+00	2.985e+04
75	158	1.077e-01	5.676e+08	75	159	3.258e-02	2.412e+08	75	160	0.000e+00	3.386e+05
75	161	1.128e+00	4.643e+09	75	162	0.000e+00	1.168e+05	75	163	0.000e+00	2.250e+04
75	164	3.451e-01	1.872e+09	75	165	2.670e+00	1.131e+10	75	167	0.000e+00	6.071e+04
75	168	0.000e+00	2.602e+05	75	170	0.000e+00	1.255e+05	75	172	2.666e-01	1.489e+09
75	173	2.538e-02	2.000e+08	75	175	0.000e+00	7.858e+04	75	176	0.000e+00	2.544e+04
75	177	0.000e+00	6.649e+03	75	178	0.000e+00	1.643e+04	75	179	8.390e-02	3.773e+08
75	180	1.208e-02	9.862e+07	75	181	7.978e-02	4.659e+08	75	182	6.020e-01	2.739e+09
75	186	1.633e-02	1.471e+08	75	187	7.672e-03	6.953e+07	75	188	5.576e-01	2.855e+09
75	190	0.000e+00	1.673e+04	75	194	0.000e+00	1.521e+05	75	211	8.258e-04	1.679e+07
75	212	8.304e-04	1.207e+07	75	213	1.515e-03	3.126e+07	75	228	3.650e-04	1.022e+07
75	229	5.252e-04	1.051e+07	75	238	4.841e-04	1.427e+07	75	241	1.024e-03	3.024e+07
75	245	0.000e+00	1.893e+04	75	259	1.240e-03	2.124e+07	75	268	2.534e-04	5.620e+06
75	269	3.245e-04	5.598e+06	75	282	0.000e+00	2.417e+04	76	85	1.075e+00	4.772e+07
76	94	6.964e-02	1.359e+07	76	103	1.724e-02	5.603e+06	76	104	3.335e-01	8.930e+07
76	108	8.733e-03	6.516e+06	76	112	0.000e+00	7.036e+03	76	113	0.000e+00	3.256e+04
76	123	0.000e+00	1.425e+04	76	131	1.534e+00	4.665e+09	76	139	0.000e+00	6.065e+03
76	140	0.000e+00	9.039e+03	76	141	0.000e+00	9.016e+04	76	142	0.000e+00	1.132e+05
76	143	0.000e+00	1.475e+04	76	150	6.637e-02	3.306e+08	76	151	8.907e-04	4.470e+06
76	152	8.223e-02	3.220e+08	76	153	1.187e+00	3.820e+09	76	155	3.452e-03	1.767e+07
76	158	1.752e-02	9.029e+07	76	161	7.386e-02	2.974e+08	76	162	0.000e+00	6.107e+03
76	164	3.172e-02	1.683e+08	76	165	1.111e+00	4.607e+09	76	166	0.000e+00	7.710e+05
76	167	0.000e+00	1.728e+04	76	168	0.000e+00	2.123e+05	76	169	6.425e+00	2.195e+10
76	170	0.000e+00	1.452e+04	76	172	1.124e-02	6.144e+07	76	175	0.000e+00	1.890e+04
76	179	9.610e-03	4.230e+07	76	181	3.016e-02	1.724e+08	76	182	4.450e-01	1.983e+09
76	194	0.000e+00	2.944e+04	76	195	0.000e+00	2.948e+05	76	212	2.441e-03	3.500e+07
76	229	1.337e-03	2.645e+07	76	245	0.000e+00	3.254e+03	76	246	0.000e+00	3.313e+04
76	249	0.000e+00	7.445e+03	76	260	2.562e-03	3.552e+07	76	269	2.706e-04	4.617e+06
77	93	8.094e-01	9.838e+07	77	97	2.628e-02	1.032e+07	77	103	5.805e-02	1.862e+07
77	105	7.470e-01	3.015e+08	77	109	9.427e-03	1.162e+07	77	114	0.000e+00	4.462e+04
77	127	0.000e+00	1.440e+04	77	128	1.449e-01	5.901e+08	77	131	2.824e-02	8.545e+07
77	132	6.189e-02	2.664e+08	77	134	9.015e-01	4.158e+09	77	136	0.000e+00	1.695e+04
77	139	0.000e+00	7.432e+03	77	140	0.000e+00	6.387e+04	77	142	0.000e+00	5.355e+03
77	144	7.991e-01	3.816e+09	77	145	0.000e+00	4.148e+03	77	147	0.000e+00	1.221e+05
77	149	1.615e-02	1.120e+08	77	150	1.715e-03	8.512e+06	77	151	2.364e-02	1.182e+08
77	152	1.632e-01	6.365e+08	77	155	2.427e-02	1.238e+08	77	156	0.000e+00	1.988e+04
77	159	1.284e-02	9.263e+07	77	161	4.953e-01	1.987e+09	77	162	0.000e+00	1.144e+04
77	163	0.000e+00	5.604e+03	77	164	4.552e-01	2.406e+09	77	165	4.863e-01	2.008e+09
77	167	0.000e+00	1.579e+05	77	168	0.000e+00	1.561e+05	77	170	0.000e+00	7.020e+05
77	173	1.680e-03	1.291e+07	77	175	0.000e+00	4.665e+03	77	176	0.000e+00	9.361e+03
77	179	1.785e+00	7.829e+09	77	180	9.116e-03	7.262e+07	77	181	1.018e-01	5.801e+08

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
77	182	7.850e-03	3.485e+07	77	187	9.988e-03	8.841e+07	77	188	1.859e+00	9.302e+09
77	190	0.000e+00	1.105e+04	77	194	0.000e+00	7.645e+04	77	209	0.000e+00	6.276e+04
77	211	3.207e-04	6.417e+06	77	213	5.455e-03	1.108e+08	77	228	2.598e-04	7.176e+06
77	238	2.438e-03	7.096e+07	77	241	2.741e-04	7.993e+06	77	245	0.000e+00	8.287e+03
77	259	4.948e-04	8.368e+06	77	265	8.276e-04	1.408e+07	77	275	0.000e+00	1.274e+04
77	282	0.000e+00	7.921e+04	78	94	1.581e+00	1.915e+08	78	95	2.968e-01	5.193e+07
78	110	0.000e+00	8.102e+03	78	125	2.595e-03	1.517e+07	78	128	5.204e-02	1.903e+08
78	130	1.279e-02	8.079e+07	78	131	2.320e-01	6.318e+08	78	132	1.118e-02	4.335e+07
78	133	1.451e-01	9.541e+08	78	137	0.000e+00	2.088e+04	78	138	0.000e+00	1.431e+04
78	139	0.000e+00	2.058e+04	78	140	0.000e+00	6.340e+03	78	141	0.000e+00	6.023e+03
78	142	0.000e+00	1.145e+04	78	143	0.000e+00	7.402e+03	78	144	2.804e-03	1.232e+07
78	145	0.000e+00	3.882e+04	78	146	0.000e+00	7.501e+04	78	148	3.605e-03	3.836e+07
78	149	7.631e-02	4.875e+08	78	150	7.167e-01	3.276e+09	78	151	5.935e-04	2.735e+06
78	155	2.621e-02	1.233e+08	78	158	6.844e-02	3.241e+08	78	159	9.220e-03	6.137e+07
78	162	0.000e+00	2.353e+04	78	164	8.069e-03	3.940e+07	78	171	3.306e-01	3.881e+09
78	172	1.711e+00	8.619e+09	78	173	3.425e-01	2.435e+09	78	174	2.793e-02	3.336e+08
78	175	0.000e+00	4.330e+05	78	176	0.000e+00	8.605e+04	78	177	0.000e+00	4.038e+04
78	178	0.000e+00	9.143e+04	78	180	1.441e-02	1.064e+08	78	181	3.398e-02	1.794e+08
78	183	1.893e-02	1.412e+08	78	184	1.360e-01	1.852e+09	78	186	4.550e-01	3.722e+09
78	187	2.958e-02	2.436e+08	78	192	0.000e+00	4.146e+04	78	193	0.000e+00	1.833e+04
78	215	0.000e+00	2.034e+04	78	216	0.000e+00	4.519e+04	78	217	0.000e+00	4.843e+04
78	218	0.000e+00	1.149e+04	78	219	0.000e+00	4.754e+04	78	220	0.000e+00	1.092e+05
78	221	0.000e+00	5.080e+04	78	222	0.000e+00	1.003e+05	78	223	0.000e+00	1.281e+05
78	234	2.058e-03	9.306e+07	78	240	1.591e-04	7.428e+06	78	241	1.102e-03	3.088e+07
78	249	0.000e+00	6.374e+03	78	274	0.000e+00	9.103e+03	78	277	3.191e-03	6.817e+07
78	278	6.508e-04	1.948e+07	79	95	7.837e-01	1.321e+08	79	96	2.703e-01	7.836e+07
79	125	1.087e-02	6.303e+07	79	126	3.623e-02	2.173e+08	79	128	8.186e-02	2.969e+08
79	132	4.236e-03	1.629e+07	79	133	1.125e-01	7.335e+08	79	134	1.017e-02	4.208e+07
79	135	1.212e-03	2.663e+07	79	136	0.000e+00	3.793e+03	79	138	0.000e+00	1.723e+04
79	141	0.000e+00	1.933e+04	79	143	0.000e+00	2.867e+04	79	145	0.000e+00	2.850e+04
79	148	9.321e-02	9.858e+08	79	149	3.898e-01	2.475e+09	79	154	9.840e-03	1.064e+08
79	159	3.153e-02	2.086e+08	79	163	0.000e+00	1.049e+04	79	171	2.001e-01	2.336e+09
79	173	9.993e-01	7.062e+09	79	174	3.872e-01	4.597e+09	79	176	0.000e+00	2.205e+05
79	177	0.000e+00	2.553e+05	79	178	0.000e+00	9.246e+04	79	180	2.732e-02	2.005e+08
79	184	1.043e-01	1.414e+09	79	185	1.195e-01	4.858e+09	79	186	1.713e-01	1.394e+09
79	191	0.000e+00	2.860e+04	79	193	0.000e+00	3.301e+04	79	207	1.459e-03	7.545e+07
79	214	0.000e+00	7.106e+03	79	215	0.000e+00	5.990e+04	79	217	0.000e+00	3.641e+04
79	218	0.000e+00	4.038e+04	79	219	0.000e+00	4.970e+04	79	221	0.000e+00	4.764e+04
79	222	0.000e+00	2.536e+04	79	234	1.240e-03	5.589e+07	79	239	2.004e-04	2.799e+07
79	240	2.936e-04	1.367e+07	79	241	3.225e-04	9.011e+06	79	278	1.825e-03	5.445e+07
79	279	6.714e-04	3.341e+07	79	281	1.324e-04	1.994e+07	80	96	3.376e-01	9.492e+07
80	125	2.007e-02	1.156e+08	80	126	1.474e-02	8.783e+07	80	130	7.783e-03	4.848e+07
80	133	4.120e-02	2.670e+08	80	140	0.000e+00	9.821e+03	80	143	0.000e+00	2.079e+04
80	148	1.641e-01	1.727e+09	80	154	1.177e-03	1.266e+07	80	171	6.932e-02	8.053e+08

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
80	174	5.017e-01	5.929e+09	80	177	0.000e+00	2.443e+05	80	184	1.363e-01	1.839e+09
80	191	0.000e+00	2.797e+04	80	216	0.000e+00	3.162e+04	80	218	0.000e+00	3.165e+04
80	221	0.000e+00	1.886e+04	80	234	4.357e-04	1.959e+07	80	240	3.139e-04	1.458e+07
80	279	8.817e-04	4.377e+07	81	92	2.048e-01	1.394e+07	81	97	8.368e-01	1.660e+08
81	109	2.768e-02	2.390e+07	81	114	0.000e+00	8.956e+03	81	125	8.832e-03	4.753e+07
81	126	4.487e-03	2.502e+07	81	128	6.941e-03	2.342e+07	81	129	6.001e-04	1.030e+07
81	133	1.251e-03	7.609e+06	81	134	4.701e-02	1.818e+08	81	135	1.185e-01	2.438e+09
81	136	0.000e+00	6.548e+03	81	140	0.000e+00	5.176e+03	81	147	0.000e+00	4.996e+04
81	148	7.966e-04	7.978e+06	81	149	4.575e-03	2.751e+07	81	154	7.273e-01	7.453e+09
81	156	0.000e+00	9.568e+04	81	159	5.983e-03	3.753e+07	81	163	0.000e+00	8.926e+03
81	171	7.339e-03	8.134e+07	81	174	5.133e-03	5.789e+07	81	176	0.000e+00	1.086e+05
81	178	0.000e+00	3.021e+05	81	180	4.380e-02	3.055e+08	81	183	9.886e-01	6.969e+09
81	184	1.405e-03	1.815e+07	81	185	3.972e-03	1.539e+08	81	186	5.995e-03	4.648e+07
81	187	4.716e-01	3.681e+09	81	206	0.000e+00	2.468e+04	81	207	8.603e-02	4.264e+09
81	208	0.000e+00	3.816e+04	81	213	4.758e-04	8.904e+06	81	214	0.000e+00	8.224e+04
81	224	0.000e+00	9.049e+04	81	225	0.000e+00	1.357e+05	81	233	5.148e-04	2.223e+07
81	238	2.379e-04	6.466e+06	81	275	0.000e+00	4.217e+04	81	280	1.442e-03	4.223e+07
81	281	7.580e-03	1.113e+09	81	283	0.000e+00	1.452e+04	82	98	1.146e-01	1.914e+07
82	124	4.750e-03	9.227e+06	82	125	0.000e+00	1.624e+04	82	136	1.373e-01	6.802e+08
82	137	2.975e-02	1.489e+08	82	139	9.097e-03	3.277e+07	82	140	8.353e-03	4.336e+07
82	141	1.507e-03	5.628e+06	82	151	0.000e+00	1.616e+04	82	152	0.000e+00	1.073e+03
82	155	0.000e+00	2.921e+04	82	157	3.804e+00	1.243e+10	82	158	0.000e+00	1.234e+04
82	159	0.000e+00	1.115e+04	82	162	2.230e-01	7.424e+08	82	163	8.507e-01	3.647e+09
82	167	2.457e-01	8.385e+08	82	175	3.772e-03	1.340e+07	82	176	5.521e-03	2.528e+07
82	177	7.607e-02	4.945e+08	82	178	1.071e-01	4.986e+08	82	189	1.331e+00	5.638e+09
82	190	2.774e+00	1.224e+10	82	191	7.702e-02	6.125e+08	82	192	1.370e-01	6.059e+08
82	196	1.286e-01	1.059e+09	82	197	3.374e-01	2.119e+09	82	201	2.565e-03	1.638e+07
82	202	3.095e-03	2.768e+07	82	203	1.920e-03	1.756e+07	82	206	2.330e-01	1.560e+09
82	214	2.302e-04	4.744e+06	82	218	1.279e-03	2.674e+07	82	227	0.000e+00	1.103e+04
82	247	3.992e-03	1.078e+08	82	248	3.773e-04	7.280e+06	82	250	3.256e-03	8.893e+07
82	251	0.000e+00	8.925e+03	82	252	1.347e-03	2.659e+07	82	253	0.000e+00	1.059e+04
82	258	0.000e+00	4.240e+04	82	259	0.000e+00	1.173e+04	82	266	0.000e+00	1.248e+05
82	267	0.000e+00	1.372e+04	82	268	0.000e+00	4.341e+03	82	275	2.293e-03	4.598e+07
82	278	0.000e+00	7.246e+03	82	279	0.000e+00	2.760e+04	83	99	2.053e-01	2.155e+07
83	128	0.000e+00	1.788e+04	83	139	1.686e-01	5.937e+08	83	141	5.720e-02	2.089e+08
83	142	1.807e-03	5.188e+06	83	147	2.316e-03	9.008e+06	83	151	0.000e+00	2.081e+03
83	152	0.000e+00	8.951e+03	83	157	8.183e-03	2.618e+07	83	160	3.808e+00	1.001e+10
83	161	0.000e+00	4.290e+04	83	162	6.375e-01	2.079e+09	83	163	9.606e-02	4.033e+08
83	164	0.000e+00	1.185e+04	83	165	0.000e+00	1.078e+04	83	167	4.817e-01	1.611e+09
83	168	8.406e-02	2.301e+08	83	170	5.062e-01	1.397e+09	83	175	1.176e-02	4.093e+07
83	176	2.945e-02	1.321e+08	83	178	9.992e-02	4.561e+08	83	190	1.928e-01	8.356e+08
83	192	9.333e-02	4.052e+08	83	193	1.393e-01	7.783e+08	83	194	5.332e+00	1.901e+10
83	197	2.176e-02	1.343e+08	83	198	1.676e-01	6.602e+08	83	199	5.741e-01	2.765e+09
83	201	5.751e-02	3.610e+08	83	209	5.420e-02	2.550e+08	83	219	2.518e-03	3.725e+07

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
83	228	0.000e+00	1.156e+04	83	248	6.169e-03	1.179e+08	83	249	5.906e-04	8.780e+06
83	253	0.000e+00	1.470e+04	83	254	2.419e-03	3.679e+07	83	255	0.000e+00	1.575e+04
83	256	1.274e-03	1.586e+07	83	258	0.000e+00	1.460e+04	83	259	0.000e+00	4.331e+04
83	260	0.000e+00	1.388e+04	83	264	2.455e-03	4.839e+07	83	266	0.000e+00	1.329e+04
83	267	0.000e+00	5.182e+03	83	268	0.000e+00	1.676e+04	83	269	0.000e+00	4.805e+03
83	270	0.000e+00	1.764e+05	83	277	0.000e+00	8.032e+03	83	278	0.000e+00	3.102e+04
84	112	2.771e-03	5.331e+06	84	116	4.217e-03	8.672e+06	84	124	9.670e-03	1.803e+07
84	126	0.000e+00	1.823e+04	84	134	0.000e+00	4.852e+03	84	136	5.707e-02	2.743e+08
84	137	1.080e-01	5.245e+08	84	139	4.334e-03	1.515e+07	84	140	5.239e-02	2.640e+08
84	142	5.357e-03	1.527e+07	84	147	6.568e-03	2.537e+07	84	151	0.000e+00	1.666e+03
84	155	0.000e+00	1.083e+04	84	157	4.030e-02	1.281e+08	84	158	0.000e+00	3.124e+04
84	162	4.566e+00	1.479e+10	84	163	2.120e-02	8.840e+07	84	164	0.000e+00	1.609e+04
84	167	9.804e-01	3.256e+09	84	175	5.044e-02	1.744e+08	84	176	2.598e-01	1.158e+09
84	177	4.839e-02	3.064e+08	84	178	4.691e-01	2.127e+09	84	179	0.000e+00	1.001e+04
84	183	0.000e+00	1.305e+04	84	189	2.037e+00	8.421e+09	84	190	1.322e+00	5.697e+09
84	191	3.336e-02	2.590e+08	84	192	1.391e-01	6.005e+08	84	193	5.937e-02	3.298e+08
84	196	3.056e-01	2.457e+09	84	197	1.599e-01	9.818e+08	84	199	2.108e-01	1.010e+09
84	201	1.102e-02	6.876e+07	84	202	7.270e-02	6.357e+08	84	203	2.138e-02	1.912e+08
84	206	5.366e-01	3.513e+09	84	218	6.832e-04	1.407e+07	84	224	4.945e-04	7.526e+06
84	233	0.000e+00	1.417e+04	84	247	8.926e-04	2.379e+07	84	250	8.163e-03	2.201e+08
84	251	0.000e+00	1.168e+04	84	252	7.076e-04	1.379e+07	84	253	0.000e+00	5.967e+03
84	254	1.426e-03	2.163e+07	84	258	0.000e+00	1.690e+04	84	261	0.000e+00	5.725e+03
84	263	2.666e-03	7.333e+07	84	266	0.000e+00	4.879e+04	84	267	0.000e+00	7.503e+03
84	275	5.409e-03	1.071e+08	84	279	0.000e+00	1.090e+04	85	100	3.090e-01	2.184e+07
85	131	0.000e+00	1.591e+04	85	142	2.640e-01	7.401e+08	85	153	0.000e+00	3.484e+03
85	157	2.207e-03	6.907e+06	85	160	2.107e-01	5.419e+08	85	162	1.079e-01	3.441e+08
85	165	0.000e+00	2.252e+04	85	166	3.666e+00	8.270e+09	85	167	4.468e-02	1.461e+08
85	168	1.549e+00	4.147e+09	85	169	0.000e+00	5.676e+04	85	170	3.544e-01	9.571e+08
85	175	9.201e-02	3.134e+08	85	190	1.066e-03	4.530e+06	85	192	1.343e-01	5.719e+08
85	194	2.823e-01	9.875e+08	85	195	7.394e+00	2.193e+10	85	198	5.308e-01	2.053e+09
85	199	2.250e-02	1.064e+08	85	220	3.180e-03	3.624e+07	85	229	0.000e+00	9.746e+03
85	249	8.769e-03	1.290e+08	85	255	0.000e+00	1.942e+04	85	256	2.069e-03	2.550e+07
85	257	0.000e+00	3.388e+04	85	259	0.000e+00	1.280e+04	85	260	0.000e+00	5.755e+04
85	268	0.000e+00	4.744e+03	85	269	0.000e+00	2.141e+04	85	270	0.000e+00	1.224e+04
85	271	0.000e+00	2.129e+05	85	277	0.000e+00	4.433e+04	86	115	2.569e-02	8.338e+07
86	127	1.973e-03	9.373e+06	86	129	0.000e+00	2.441e+04	86	130	0.000e+00	7.443e+03
86	136	3.029e-02	1.408e+08	86	138	1.737e-01	1.367e+09	86	140	2.312e-02	1.128e+08
86	145	1.022e-03	8.710e+06	86	147	1.426e-02	5.337e+07	86	151	0.000e+00	1.593e+03
86	159	0.000e+00	4.355e+04	86	163	4.977e+00	2.014e+10	86	164	0.000e+00	1.279e+04
86	174	0.000e+00	8.996e+03	86	176	2.314e-02	1.002e+08	86	177	4.104e-01	2.524e+09
86	178	1.136e-01	5.004e+08	86	191	4.396e-01	3.326e+09	86	197	2.409e+00	1.442e+10
86	200	3.774e-01	5.358e+09	86	202	1.274e-02	1.087e+08	86	203	4.220e-03	3.683e+07
86	204	5.825e-03	8.481e+07	86	206	3.054e-03	1.952e+07	86	208	6.296e-03	1.029e+08
86	215	4.280e-04	1.435e+07	86	218	3.542e-04	7.180e+06	86	239	0.000e+00	1.868e+04

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
86	240	0.000e+00	9.236e+03	86	252	1.343e-02	2.580e+08	86	258	0.000e+00	4.688e+03
86	262	1.524e-02	6.887e+08	86	263	1.684e-03	4.569e+07	86	283	3.364e-04	1.585e+07
87	116	3.220e-02	6.179e+07	87	130	0.000e+00	1.248e+04	87	132	0.000e+00	4.539e+03
87	137	1.333e-01	6.190e+08	87	139	1.857e-02	6.207e+07	87	140	1.089e-01	5.252e+08
87	141	3.993e-02	1.386e+08	87	142	3.716e-03	1.014e+07	87	143	2.000e-03	1.002e+07
87	147	8.083e-03	2.992e+07	87	157	2.637e-01	8.042e+08	87	158	0.000e+00	1.712e+04
87	159	0.000e+00	1.377e+04	87	162	1.877e+00	5.835e+09	87	163	3.900e-01	1.561e+09
87	164	0.000e+00	1.257e+04	87	165	0.000e+00	1.640e+04	87	167	3.768e+00	1.202e+10
87	173	0.000e+00	1.169e+04	87	175	3.372e-02	1.121e+08	87	176	9.089e-01	3.895e+09
87	177	1.931e-02	1.175e+08	87	178	7.080e-02	3.088e+08	87	189	1.639e-01	6.537e+08
87	190	3.752e-01	1.561e+09	87	191	2.430e-02	1.821e+08	87	192	1.216e-02	5.068e+07
87	193	5.423e-01	2.908e+09	87	196	2.094e-02	1.625e+08	87	197	7.873e-02	4.673e+08
87	199	2.933e+00	1.359e+10	87	202	4.699e-01	3.974e+09	87	203	2.782e-02	2.407e+08
87	206	3.734e-02	2.367e+08	87	216	5.722e-04	1.146e+07	87	219	5.836e-04	8.417e+06
87	240	0.000e+00	1.034e+04	87	241	0.000e+00	5.712e+03	87	247	3.804e-04	9.950e+06
87	250	6.877e-04	1.819e+07	87	254	1.602e-02	2.384e+08	87	255	0.000e+00	3.749e+03
87	259	0.000e+00	8.858e+03	87	263	2.000e-02	5.399e+08	87	264	1.116e-03	2.151e+07
87	266	0.000e+00	1.564e+04	87	279	0.000e+00	7.380e+03	88	117	4.224e-02	5.758e+07
88	131	0.000e+00	6.649e+03	88	132	0.000e+00	1.290e+04	88	139	1.169e-01	3.877e+08
88	141	1.515e-01	5.218e+08	88	142	7.292e-02	1.975e+08	88	157	6.310e-02	1.911e+08
88	160	1.171e+00	2.914e+09	88	161	0.000e+00	1.570e+04	88	162	6.261e-02	1.933e+08
88	163	1.651e-02	6.565e+07	88	165	0.000e+00	1.392e+04	88	167	4.542e-01	1.439e+09
88	168	5.009e+00	1.299e+10	88	169	0.000e+00	1.873e+04	88	170	1.077e+00	2.817e+09
88	172	0.000e+00	2.411e+04	88	175	1.516e+00	5.006e+09	88	176	2.014e-02	8.572e+07
88	178	1.331e-02	5.764e+07	88	189	4.475e-03	1.773e+07	88	190	1.219e-01	5.037e+08
88	192	5.894e-01	2.441e+09	88	193	1.538e-02	8.199e+07	88	194	5.125e-01	1.743e+09
88	198	4.165e+00	1.569e+10	88	199	7.065e-02	3.254e+08	88	201	5.959e-01	3.577e+09
88	209	2.230e-02	1.007e+08	88	217	1.000e-03	1.427e+07	88	220	7.930e-04	8.886e+06
88	229	0.000e+00	8.744e+03	88	241	0.000e+00	1.560e+04	88	248	6.334e-04	1.180e+07
88	256	2.263e-02	2.749e+08	88	257	0.000e+00	4.788e+03	88	260	0.000e+00	9.833e+03
88	264	2.820e-02	5.419e+08	88	270	0.000e+00	1.845e+04	88	278	0.000e+00	7.979e+03
89	100	1.227e+00	4.652e+07	89	112	3.526e-03	5.713e+06	89	113	1.510e-02	2.476e+07
89	117	7.631e-02	9.561e+07	89	120	5.670e-02	5.807e+07	89	123	3.774e-02	8.114e+07
89	132	0.000e+00	4.689e+03	89	133	0.000e+00	4.549e+03	89	136	3.060e-02	1.321e+08
89	137	1.874e-01	8.182e+08	89	139	6.301e-01	1.981e+09	89	140	3.421e-02	1.553e+08
89	141	2.114e-01	6.908e+08	89	142	7.284e-01	1.872e+09	89	143	7.563e-01	3.571e+09
89	147	2.682e-02	9.367e+07	89	157	5.048e-03	1.455e+07	89	162	2.187e-02	6.428e+07
89	167	1.462e-02	4.412e+07	89	172	0.000e+00	1.594e+04	89	173	0.000e+00	1.749e+04
89	175	3.666e+00	1.154e+10	89	176	2.809e-01	1.140e+09	89	177	2.166e-02	1.250e+08
89	178	3.117e-01	1.288e+09	89	182	0.000e+00	5.312e+03	89	189	3.982e-02	1.511e+08
89	190	5.433e-02	2.153e+08	89	192	9.392e-01	3.728e+09	89	193	1.983e-02	1.013e+08
89	196	3.454e-03	2.557e+07	89	197	1.757e-02	9.963e+07	89	199	1.733e-01	7.666e+08
89	201	5.876e-01	3.390e+09	89	202	1.641e-02	1.326e+08	89	203	4.630e-01	3.831e+09
89	206	7.807e-03	4.733e+07	89	220	3.137e-03	3.426e+07	89	221	5.970e-04	1.193e+07

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
89	227	0.000e+00	8.177e+03	89	228	0.000e+00	4.603e+04	89	229	0.000e+00	6.268e+04
89	231	0.000e+00	1.771e+04	89	232	0.000e+00	9.595e+04	89	234	0.000e+00	2.116e+04
89	235	0.000e+00	6.845e+03	89	236	0.000e+00	4.989e+04	89	237	0.000e+00	1.298e+05
89	240	0.000e+00	5.962e+04	89	241	0.000e+00	4.600e+04	89	264	5.065e-03	9.523e+07
89	272	1.317e-02	3.482e+08	89	277	0.000e+00	5.702e+03	89	278	0.000e+00	4.467e+03
90	98	1.167e-01	7.558e+06	90	99	9.464e-01	4.384e+07	90	111	7.072e-03	1.780e+07
90	115	5.219e-03	1.495e+07	90	116	4.673e-02	8.064e+07	90	119	4.751e-02	6.112e+07
90	122	2.230e-02	7.893e+07	90	123	8.031e-03	1.712e+07	90	127	1.407e-03	6.033e+06
90	133	0.000e+00	5.593e+03	90	136	3.017e-02	1.295e+08	90	137	3.175e-01	1.378e+09
90	138	1.605e-01	1.167e+09	90	139	4.179e-02	1.306e+08	90	140	5.229e-02	2.360e+08
90	141	5.875e-01	1.908e+09	90	143	3.536e-01	1.660e+09	90	145	4.498e-01	3.553e+09
90	147	3.745e-02	1.300e+08	90	156	2.267e-03	1.939e+07	90	172	0.000e+00	1.051e+04
90	174	0.000e+00	2.409e+04	90	176	1.550e+00	6.257e+09	90	177	4.378e-01	2.513e+09
90	178	7.099e-01	2.919e+09	90	191	3.433e-02	2.440e+08	90	193	6.318e-01	3.213e+09
90	197	8.091e-02	4.567e+08	90	200	3.250e-02	4.351e+08	90	201	6.990e-02	4.014e+08
90	202	2.950e-01	2.374e+09	90	203	7.855e-02	6.470e+08	90	204	2.075e-01	2.851e+09
90	206	4.347e-03	2.624e+07	90	208	1.612e-03	2.495e+07	90	219	2.582e-03	3.607e+07
90	222	3.381e-04	1.123e+07	90	227	0.000e+00	7.574e+04	90	228	0.000e+00	2.641e+04
90	229	0.000e+00	2.947e+04	90	230	0.000e+00	2.580e+04	90	231	0.000e+00	9.112e+04
90	234	0.000e+00	2.021e+04	90	235	0.000e+00	7.648e+04	90	236	0.000e+00	9.054e+04
90	237	0.000e+00	3.203e+04	90	238	0.000e+00	8.250e+03	90	239	0.000e+00	1.489e+05
90	240	0.000e+00	7.903e+03	90	241	0.000e+00	3.700e+04	90	263	2.181e-03	5.726e+07
90	272	2.577e-03	6.796e+07	90	273	6.089e-03	2.678e+08	90	279	0.000e+00	6.093e+03
91	98	7.032e-01	4.400e+07	91	110	3.648e-03	2.716e+07	91	115	2.436e-02	6.933e+07
91	116	3.142e-03	5.385e+06	91	118	3.443e-02	6.095e+07	91	121	1.045e-02	1.103e+08
91	122	8.421e-03	2.963e+07	91	133	0.000e+00	4.382e+03	91	136	9.843e-02	4.207e+08
91	137	9.227e-03	3.987e+07	91	138	2.270e-01	1.643e+09	91	140	3.602e-01	1.619e+09
91	143	4.573e-02	2.138e+08	91	145	3.061e-01	2.408e+09	91	146	2.578e-01	6.123e+09
91	173	0.000e+00	1.189e+04	91	174	0.000e+00	9.980e+03	91	177	1.416e+00	8.094e+09
91	191	3.809e-01	2.698e+09	91	200	1.396e-01	1.864e+09	91	202	5.419e-02	4.347e+08
91	203	5.513e-03	4.527e+07	91	204	8.381e-02	1.148e+09	91	205	8.937e-02	3.679e+09
91	218	1.938e-03	3.774e+07	91	223	1.575e-04	1.566e+07	91	227	0.000e+00	4.598e+04
91	228	0.000e+00	4.509e+04	91	230	0.000e+00	9.559e+04	91	234	0.000e+00	1.477e+04
91	235	0.000e+00	1.174e+05	91	236	0.000e+00	4.320e+04	91	240	0.000e+00	7.061e+04
91	241	0.000e+00	1.268e+04	91	262	9.130e-04	3.988e+07	91	273	2.110e-03	9.265e+07
91	274	2.478e-03	3.265e+08	92	101	1.891e+00	9.826e+07	92	112	5.480e-02	8.341e+07
92	113	1.411e-02	2.175e+07	92	114	6.774e-03	1.782e+07	92	124	3.754e-01	5.731e+08
92	127	1.513e-01	6.222e+08	92	135	0.000e+00	7.059e+03	92	136	6.896e-01	2.867e+09
92	137	3.784e-02	1.590e+08	92	138	1.137e-03	8.007e+06	92	139	3.678e-02	1.113e+08
92	140	2.466e-01	1.079e+09	92	141	2.094e-02	6.593e+07	92	143	6.135e-02	2.793e+08
92	147	6.607e-01	2.226e+09	92	156	6.930e-01	5.757e+09	92	176	1.469e-01	5.767e+08
92	178	3.462e-01	1.384e+09	92	179	0.000e+00	1.378e+04	92	187	0.000e+00	4.434e+03
92	188	0.000e+00	5.675e+03	92	191	1.341e-03	9.295e+06	92	196	2.869e-02	2.064e+08
92	197	6.922e-03	3.816e+07	92	200	1.638e-03	2.142e+07	92	206	7.814e-02	4.611e+08

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
92	208	4.398e-02	6.659e+08	92	214	4.477e-03	8.483e+07	92	225	7.053e-03	2.380e+08
92	226	0.000e+00	1.934e+05	92	233	0.000e+00	1.883e+05	92	238	0.000e+00	3.916e+05
92	241	0.000e+00	4.136e+04	92	242	0.000e+00	3.056e+05	92	275	9.578e-04	1.788e+07
92	280	0.000e+00	9.809e+03	92	281	0.000e+00	5.490e+05	92	283	3.017e-03	1.360e+08
93	101	5.215e-01	2.220e+07	93	124	1.242e-01	1.831e+08	93	134	0.000e+00	1.391e+04
93	139	1.831e-03	5.404e+06	93	141	1.773e-03	5.446e+06	93	147	2.043e-01	6.722e+08
93	157	3.407e-01	9.267e+08	93	160	2.296e-01	5.135e+08	93	162	8.112e-01	2.252e+09
93	163	4.942e-02	1.767e+08	93	167	9.390e-01	2.679e+09	93	168	3.290e-02	7.682e+07
93	170	1.890e+00	4.455e+09	93	175	1.633e-01	4.865e+08	93	176	2.264e-01	8.698e+08
93	178	2.417e-01	9.458e+08	93	179	0.000e+00	5.413e+04	93	188	0.000e+00	1.098e+04
93	189	4.216e-02	1.522e+08	93	190	1.183e-03	4.465e+06	93	192	4.787e-03	1.809e+07
93	193	2.085e-03	1.014e+07	93	194	2.873e-02	8.920e+07	93	198	3.039e-02	1.050e+08
93	199	6.593e-03	2.784e+07	93	201	4.962e-03	2.733e+07	93	206	8.111e-02	4.701e+08
93	209	4.537e+00	1.894e+10	93	224	1.434e-03	2.017e+07	93	238	0.000e+00	2.259e+04
93	243	8.309e-03	1.137e+08	93	251	0.000e+00	1.869e+05	93	255	0.000e+00	7.707e+03
93	261	0.000e+00	1.118e+05	93	265	0.000e+00	1.425e+05	93	269	0.000e+00	2.405e+04
93	275	1.988e-02	3.675e+08	93	276	0.000e+00	1.495e+05	93	280	0.000e+00	1.312e+05
93	282	6.337e-02	7.689e+08	94	100	8.370e-01	9.980e+06	94	113	7.380e-03	1.003e+07
94	120	5.379e-03	4.618e+06	94	123	3.896e-03	7.117e+06	94	133	0.000e+00	5.008e+03
94	136	9.090e-03	3.504e+07	94	137	1.028e-01	4.008e+08	94	139	4.125e-01	1.159e+09
94	140	1.809e-02	7.352e+07	94	141	9.192e-02	2.690e+08	94	142	4.336e-01	9.988e+08
94	143	3.916e-02	1.659e+08	94	147	1.333e-02	4.184e+07	94	162	1.897e-01	5.034e+08
94	163	7.553e-03	2.581e+07	94	169	0.000e+00	1.051e+04	94	172	0.000e+00	1.412e+04
94	173	0.000e+00	1.080e+04	94	175	2.891e+00	8.247e+09	94	176	1.656e-01	6.090e+08
94	177	1.115e-02	5.836e+07	94	178	1.681e-01	6.301e+08	94	189	1.072e-02	3.720e+07
94	190	6.724e-02	2.441e+08	94	191	1.383e-03	9.044e+06	94	192	1.004e+00	3.652e+09
94	193	6.603e-02	3.091e+08	94	197	5.631e-03	2.938e+07	94	199	2.392e-02	9.742e+07
94	201	5.998e-01	3.187e+09	94	202	5.614e-02	4.178e+08	94	203	5.927e-01	4.520e+09
94	220	8.477e-04	8.786e+06	94	227	0.000e+00	1.588e+04	94	228	0.000e+00	9.825e+04
94	229	0.000e+00	1.747e+05	94	231	0.000e+00	2.840e+04	94	232	0.000e+00	1.634e+05
94	234	0.000e+00	2.187e+05	94	235	0.000e+00	6.637e+03	94	236	0.000e+00	5.221e+04
94	237	0.000e+00	1.565e+05	94	238	0.000e+00	1.202e+04	94	240	0.000e+00	1.413e+05
94	241	0.000e+00	1.758e+05	94	249	8.695e-04	1.177e+07	94	260	0.000e+00	1.336e+04
94	263	4.684e-04	1.178e+07	94	264	2.577e-03	4.630e+07	94	272	1.885e-02	4.765e+08
94	277	0.000e+00	5.402e+03	95	111	3.488e-03	7.215e+06	95	122	2.630e-03	7.900e+06
95	133	0.000e+00	5.279e+03	95	136	7.784e-03	2.981e+07	95	137	1.912e-01	7.405e+08
95	138	7.569e-02	4.915e+08	95	139	1.967e-02	5.489e+07	95	140	1.626e-02	6.566e+07
95	141	2.683e-01	7.801e+08	95	143	4.869e-02	2.050e+08	95	145	1.308e-02	9.267e+07
95	147	7.692e-03	2.400e+07	95	151	0.000e+00	7.329e+02	95	152	0.000e+00	1.037e+03
95	156	2.053e-03	1.583e+07	95	163	7.567e-02	2.571e+08	95	172	0.000e+00	9.014e+03
95	174	0.000e+00	2.026e+04	95	176	1.599e+00	5.848e+09	95	177	3.633e-01	1.890e+09
95	178	7.452e-01	2.778e+09	95	191	8.848e-02	5.759e+08	95	193	8.527e-01	3.971e+09
95	196	2.469e-03	1.669e+07	95	197	1.553e-02	8.067e+07	95	200	8.242e-02	1.016e+09
95	201	8.955e-02	4.735e+08	95	202	3.695e-01	2.737e+09	95	203	1.288e-01	9.775e+08

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
95	204	3.330e-01	4.216e+09	95	206	1.181e-02	6.576e+07	95	208	3.859e-03	5.531e+07
95	219	4.988e-04	6.609e+06	95	227	0.000e+00	1.294e+05	95	228	0.000e+00	5.800e+04
95	229	0.000e+00	6.069e+04	95	230	0.000e+00	3.271e+04	95	231	0.000e+00	1.198e+05
95	234	0.000e+00	1.426e+05	95	235	0.000e+00	6.286e+04	95	236	0.000e+00	8.402e+04
95	237	0.000e+00	2.913e+04	95	238	0.000e+00	1.831e+04	95	239	0.000e+00	2.924e+05
95	240	0.000e+00	2.880e+04	95	241	0.000e+00	9.337e+04	95	248	5.612e-04	9.738e+06
95	259	0.000e+00	1.160e+04	95	262	3.437e-04	1.437e+07	95	263	1.214e-03	3.047e+07
95	272	4.443e-03	1.120e+08	95	273	1.128e-02	4.743e+08	95	279	0.000e+00	5.965e+03
95	281	0.000e+00	5.090e+03	96	110	1.624e-03	9.883e+06	96	121	1.510e-03	1.347e+07
96	136	4.032e-02	1.534e+08	96	137	1.934e-03	7.443e+06	96	138	1.086e-01	7.002e+08
96	140	1.361e-01	5.461e+08	96	143	7.011e-03	2.932e+07	96	145	2.260e-02	1.591e+08
96	146	7.669e-03	1.631e+08	96	151	0.000e+00	1.603e+03	96	156	1.058e-03	8.108e+06
96	173	0.000e+00	1.289e+04	96	174	0.000e+00	1.194e+04	96	177	1.814e+00	9.384e+09
96	191	6.417e-01	4.155e+09	96	196	2.112e-03	1.420e+07	96	200	2.292e-01	2.812e+09
96	202	9.095e-02	6.704e+08	96	203	1.099e-02	8.302e+07	96	204	1.633e-01	2.057e+09
96	205	1.758e-01	6.656e+09	96	218	3.114e-04	5.748e+06	96	227	0.000e+00	7.148e+04
96	228	0.000e+00	7.100e+04	96	229	0.000e+00	6.336e+03	96	230	0.000e+00	1.008e+05
96	234	0.000e+00	8.062e+04	96	235	0.000e+00	8.356e+04	96	236	0.000e+00	3.087e+04
96	240	0.000e+00	1.327e+05	96	241	0.000e+00	2.386e+04	96	247	3.896e-04	9.436e+06
96	258	0.000e+00	1.135e+04	96	262	7.468e-04	3.114e+07	96	272	3.644e-04	9.163e+06
96	273	4.635e-03	1.944e+08	96	274	5.687e-03	7.156e+08	97	112	1.268e-02	1.396e+07
97	124	6.125e-02	7.140e+07	97	127	3.758e-02	1.204e+08	97	135	0.000e+00	2.800e+04
97	136	2.250e-03	7.736e+06	97	147	9.954e-03	2.808e+07	97	156	7.701e-02	5.384e+08
97	163	1.678e-01	5.177e+08	97	176	1.591e+00	5.303e+09	97	178	3.436e+00	1.168e+10
97	183	0.000e+00	5.422e+04	97	193	1.732e-02	7.430e+07	97	196	6.124e-01	3.819e+09
97	200	4.045e-03	4.617e+07	97	202	3.691e-03	2.531e+07	97	203	2.378e-03	1.673e+07
97	204	3.879e-03	4.552e+07	97	206	1.964e+00	1.015e+10	97	207	0.000e+00	1.514e+04
97	208	7.925e-01	1.058e+10	97	214	1.432e-03	2.489e+07	97	224	2.046e-03	2.675e+07
97	225	6.479e-03	2.011e+08	97	226	0.000e+00	1.381e+04	97	233	0.000e+00	9.042e+04
97	238	0.000e+00	1.028e+05	97	241	0.000e+00	1.148e+04	97	242	0.000e+00	4.472e+04
97	250	1.639e-03	3.863e+07	97	261	0.000e+00	1.997e+04	97	275	2.273e-02	3.943e+08
97	280	0.000e+00	5.383e+03	97	281	0.000e+00	3.241e+05	97	283	4.310e-02	1.807e+09
98	125	1.560e-03	4.492e+06	98	126	2.440e-03	7.377e+06	98	151	8.984e-02	2.521e+08
98	155	2.177e-01	6.273e+08	98	158	5.906e-02	1.716e+08	98	159	5.747e-01	2.350e+09
98	164	7.385e-01	2.231e+09	98	172	2.206e-02	6.935e+07	98	173	3.065e-01	1.362e+09
98	174	7.080e-01	5.298e+09	98	180	5.345e-02	2.491e+08	98	181	1.363e-02	4.545e+07
98	183	9.198e-03	4.341e+07	98	230	2.770e-03	4.192e+07	98	244	0.000e+00	2.420e+05
98	247	0.000e+00	2.311e+05	98	248	0.000e+00	6.876e+04	98	252	0.000e+00	2.557e+05
98	254	0.000e+00	4.201e+04	98	258	1.598e-03	2.688e+07	98	262	0.000e+00	2.191e+05
98	263	0.000e+00	1.042e+05	98	272	0.000e+00	2.138e+04	98	273	0.000e+00	1.691e+05
98	274	0.000e+00	4.022e+05	99	128	5.549e-03	1.018e+07	99	151	4.915e-02	1.379e+08
99	152	3.671e-02	8.044e+07	99	155	1.582e-02	4.557e+07	99	158	6.818e-01	1.981e+09
99	159	2.773e-01	1.133e+09	99	161	2.075e-01	4.718e+08	99	164	9.220e-02	2.785e+08
99	165	1.191e+00	2.814e+09	99	172	3.756e-01	1.181e+09	99	173	8.024e-01	3.565e+09

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
99	179	3.886e-02	9.941e+07	99	180	4.532e-03	2.111e+07	99	181	7.732e-02	2.578e+08
99	182	1.095e-02	2.846e+07	99	183	5.369e-02	2.534e+08	99	231	3.537e-03	4.166e+07
99	244	0.000e+00	3.581e+04	99	245	0.000e+00	2.526e+05	99	247	0.000e+00	1.076e+05
99	248	0.000e+00	1.945e+05	99	249	0.000e+00	5.600e+04	99	252	0.000e+00	6.995e+04
99	254	0.000e+00	2.345e+05	99	256	0.000e+00	3.539e+04	99	259	1.978e-03	2.589e+07
99	262	0.000e+00	1.614e+05	99	263	0.000e+00	1.562e+05	99	264	0.000e+00	8.454e+04
99	272	0.000e+00	1.102e+05	99	273	0.000e+00	2.324e+05	100	131	8.417e-03	1.169e+07
100	151	1.430e-03	4.011e+06	100	152	4.652e-02	1.019e+08	100	153	1.162e-02	2.095e+07
100	155	6.712e-02	1.934e+08	100	158	3.628e-01	1.054e+09	100	161	1.159e+00	2.635e+09
100	164	4.482e-02	1.353e+08	100	165	2.897e-01	6.846e+08	100	169	1.817e+00	3.546e+09
100	172	1.114e+00	3.502e+09	100	179	2.295e-02	5.870e+07	100	182	1.047e-01	2.720e+08
100	232	4.456e-03	4.299e+07	100	245	0.000e+00	3.042e+04	100	246	0.000e+00	2.834e+05
100	248	0.000e+00	8.244e+04	100	249	0.000e+00	2.867e+05	100	254	0.000e+00	5.302e+04
100	256	0.000e+00	2.948e+05	100	260	2.510e-03	2.688e+07	100	263	0.000e+00	1.201e+05
100	264	0.000e+00	2.852e+05	100	272	0.000e+00	2.687e+05	101	109	1.154e-01	1.833e+07
101	134	1.891e-02	3.899e+07	101	151	4.766e-02	1.273e+08	101	152	4.073e-03	8.498e+06
101	155	8.216e-01	2.256e+09	101	156	0.000e+00	6.268e+03	101	158	5.235e-02	1.450e+08
101	159	3.166e-02	1.233e+08	101	161	4.070e-02	8.823e+07	101	164	3.154e-01	9.088e+08
101	165	4.829e-03	1.089e+07	101	172	5.976e-02	1.794e+08	101	173	3.150e-02	1.337e+08
101	179	1.097e+00	2.683e+09	101	180	6.443e-02	2.870e+08	101	182	2.152e-02	5.347e+07
101	183	1.098e+00	4.956e+09	101	186	1.399e-03	7.108e+06	101	187	3.020e-02	1.547e+08
101	188	1.104e-01	3.214e+08	101	213	9.439e-04	1.360e+07	101	226	1.921e-03	2.809e+07
101	242	3.918e-03	4.806e+07	101	243	0.000e+00	3.250e+05	101	244	0.000e+00	3.645e+03
101	250	0.000e+00	3.831e+05	101	261	3.904e-04	6.478e+06	101	265	1.233e-02	1.593e+08
101	269	2.268e-03	2.934e+07	101	275	0.000e+00	4.043e+05	101	282	0.000e+00	2.458e+05
101	283	0.000e+00	3.816e+05	102	136	6.327e-03	1.879e+07	102	137	7.903e-03	2.377e+07
102	140	1.546e-02	4.875e+07	102	141	1.679e-03	3.816e+06	102	157	1.794e+00	3.684e+09
102	163	4.216e-01	1.142e+09	102	167	8.868e-01	1.924e+09	102	175	1.013e-02	2.309e+07
102	176	2.165e-01	6.367e+08	102	177	9.867e-01	4.134e+09	102	178	2.646e-02	7.948e+07
102	190	1.204e+00	3.586e+09	102	191	1.284e-01	6.893e+08	102	192	8.534e-02	2.548e+08
102	193	1.279e-02	4.918e+07	102	197	1.943e-01	8.414e+08	102	199	2.694e-02	9.109e+07
102	218	6.724e-04	1.113e+07	102	244	2.779e-03	3.386e+07	102	247	1.928e-03	4.248e+07
102	253	0.000e+00	2.011e+05	102	255	0.000e+00	1.467e+04	102	258	0.000e+00	1.989e+05
102	259	0.000e+00	1.001e+05	102	260	0.000e+00	4.719e+03	102	265	0.000e+00	4.744e+03
102	266	0.000e+00	1.342e+05	102	267	0.000e+00	2.741e+05	102	268	0.000e+00	7.338e+04
102	278	0.000e+00	6.141e+04	102	279	0.000e+00	3.121e+05	103	139	1.556e-02	3.368e+07
103	141	2.454e-02	5.565e+07	103	142	3.018e-03	5.396e+06	103	157	3.119e-01	6.391e+08
103	160	1.491e+00	2.514e+09	103	162	2.692e-01	5.647e+08	103	163	1.914e-01	5.171e+08
103	167	8.865e-02	1.919e+08	103	168	1.813e+00	3.212e+09	103	170	4.916e-02	8.804e+07
103	175	2.509e-01	5.709e+08	103	176	5.019e-01	1.473e+09	103	178	6.321e-01	1.895e+09
103	190	7.611e-02	2.264e+08	103	193	1.580e-01	6.063e+08	103	194	1.728e+00	4.233e+09
103	197	9.898e-03	4.280e+07	103	198	3.115e-02	8.599e+07	103	199	2.419e-01	8.166e+08
103	219	9.146e-04	1.083e+07	103	245	3.441e-03	3.430e+07	103	248	2.665e-03	4.193e+07
103	251	0.000e+00	4.322e+03	103	253	0.000e+00	9.793e+04	103	255	0.000e+00	1.802e+05

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
103	257	0.000e+00	1.622e+04	103	258	0.000e+00	5.944e+04	103	259	0.000e+00	1.214e+05
103	260	0.000e+00	1.019e+05	103	265	0.000e+00	5.385e+03	103	266	0.000e+00	6.479e+03
103	267	0.000e+00	6.390e+04	103	268	0.000e+00	2.161e+05	103	269	0.000e+00	5.498e+04
103	270	0.000e+00	1.328e+05	103	277	0.000e+00	4.407e+04	103	278	0.000e+00	2.432e+05
103	280	0.000e+00	5.787e+03	104	142	5.821e-02	1.038e+08	104	157	5.550e-03	1.134e+07
104	160	5.758e-01	9.683e+08	104	162	3.440e-01	7.198e+08	104	166	4.080e+00	6.069e+09
104	167	2.303e-02	4.971e+07	104	168	1.809e-01	3.198e+08	104	170	2.813e-01	5.024e+08
104	175	1.318e+00	2.991e+09	104	190	7.339e-03	2.178e+07	104	192	1.879e-01	5.588e+08
104	194	6.851e-02	1.674e+08	104	195	2.403e+00	4.981e+09	104	198	3.335e-01	9.187e+08
104	199	1.020e-02	3.436e+07	104	220	1.287e-03	1.187e+07	104	246	4.218e-03	3.556e+07
104	249	3.652e-03	4.464e+07	104	251	0.000e+00	5.418e+03	104	253	0.000e+00	8.274e+03
104	255	0.000e+00	1.008e+05	104	257	0.000e+00	2.928e+05	104	259	0.000e+00	4.504e+04
104	260	0.000e+00	1.574e+05	104	265	0.000e+00	3.932e+04	104	268	0.000e+00	4.701e+04
104	269	0.000e+00	2.297e+05	104	270	0.000e+00	4.823e+03	104	271	0.000e+00	1.329e+05
104	277	0.000e+00	2.579e+05	105	124	1.192e-01	9.424e+07	105	134	0.000e+00	5.292e+03
105	139	9.855e-03	1.913e+07	105	147	3.151e-01	6.985e+08	105	157	3.924e-02	7.287e+07
105	160	1.301e+00	1.988e+09	105	162	7.222e-02	1.374e+08	105	163	6.423e-02	1.575e+08
105	167	6.840e-02	1.345e+08	105	168	3.641e-01	5.861e+08	105	170	5.089e+00	8.284e+09
105	175	3.217e-03	6.666e+06	105	176	3.825e-01	1.022e+09	105	178	5.170e-01	1.413e+09
105	179	0.000e+00	1.180e+04	105	188	0.000e+00	3.775e+03	105	189	3.341e-01	8.694e+08
105	190	1.429e-03	3.917e+06	105	194	2.003e-02	4.523e+07	105	206	2.063e-01	8.948e+08
105	209	3.939e+00	1.253e+10	105	224	4.547e-03	5.333e+07	105	243	8.731e-03	1.017e+08
105	251	0.000e+00	1.462e+05	105	255	0.000e+00	5.586e+03	105	261	0.000e+00	2.467e+05
105	265	0.000e+00	1.576e+05	105	269	0.000e+00	2.590e+04	105	275	1.699e-02	2.683e+08
105	276	0.000e+00	1.206e+05	105	280	0.000e+00	2.031e+05	105	282	6.745e-02	7.012e+08
106	110	4.577e-02	8.823e+07	106	111	2.058e-02	1.340e+07	106	114	3.367e-02	2.638e+07
106	115	5.241e-01	4.372e+08	106	116	4.420e-02	2.227e+07	106	118	1.282e+00	6.853e+08
106	121	2.498e-01	9.097e+08	106	122	2.052e-01	2.492e+08	106	123	1.535e-02	1.125e+07
106	136	9.271e-03	1.998e+07	106	137	2.906e-03	6.359e+06	106	138	9.946e-03	3.655e+07
106	140	2.835e-02	6.554e+07	106	143	2.265e-03	5.532e+06	106	145	1.561e-02	6.439e+07
106	146	1.377e-02	1.719e+08	106	148	0.000e+00	9.366e+03	106	149	0.000e+00	9.467e+03
106	151	0.000e+00	1.134e+04	106	171	0.000e+00	6.301e+03	106	177	1.822e-02	5.849e+07
106	180	0.000e+00	2.439e+04	106	181	0.000e+00	8.986e+03	106	184	0.000e+00	2.845e+04
106	186	0.000e+00	5.498e+03	106	191	4.568e-03	1.943e+07	106	205	1.463e-03	3.768e+07
106	214	3.452e-03	4.939e+07	106	215	1.008e-01	2.423e+09	106	216	1.572e-02	2.269e+08
106	218	2.954e-01	4.298e+09	106	221	2.418e-03	3.602e+07	106	222	3.233e-02	8.027e+08
106	223	3.941e-02	2.936e+09	106	227	0.000e+00	1.987e+05	106	228	0.000e+00	2.053e+05
106	229	0.000e+00	1.971e+04	106	230	0.000e+00	4.347e+05	106	234	0.000e+00	1.062e+05
106	235	0.000e+00	2.437e+05	106	236	0.000e+00	8.339e+04	106	240	0.000e+00	1.685e+05
106	241	0.000e+00	3.060e+04	107	111	1.012e-01	6.560e+07	107	112	1.701e-02	7.442e+06
107	113	1.208e-02	5.409e+06	107	114	1.347e-02	1.051e+07	107	115	2.066e-01	1.715e+08
107	116	9.996e-01	5.015e+08	107	117	2.129e-02	7.728e+06	107	118	6.605e-02	3.517e+07
107	119	1.893e+00	7.339e+08	107	122	5.207e-01	6.301e+08	107	123	2.021e-01	1.476e+08
107	136	2.724e-03	5.859e+06	107	137	1.904e-02	4.158e+07	107	138	1.119e-02	4.104e+07

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
107	139	8.782e-03	1.386e+07	107	141	4.908e-02	8.176e+07	107	143	1.857e-02	4.527e+07
107	145	2.459e-02	1.012e+08	107	148	0.000e+00	1.542e+04	107	149	0.000e+00	6.650e+03
107	150	0.000e+00	7.443e+03	107	151	0.000e+00	3.211e+03	107	152	0.000e+00	1.631e+04
107	171	0.000e+00	1.048e+04	107	176	1.292e-02	2.899e+07	107	177	3.338e-03	1.070e+07
107	178	1.258e-02	2.893e+07	107	180	0.000e+00	1.825e+04	107	181	0.000e+00	2.360e+04
107	182	0.000e+00	7.496e+03	107	184	0.000e+00	5.248e+03	107	185	0.000e+00	6.366e+04
107	186	0.000e+00	2.167e+04	107	193	6.321e-03	1.922e+07	107	204	2.959e-03	2.533e+07
107	214	3.135e-03	4.481e+07	107	215	3.975e-02	9.543e+08	107	216	1.725e-01	2.488e+09
107	217	1.035e-02	1.068e+08	107	218	3.339e-02	4.854e+08	107	219	4.333e-01	4.509e+09
107	221	3.432e-02	5.109e+08	107	222	8.646e-02	2.145e+09	107	227	0.000e+00	3.295e+05
107	228	0.000e+00	1.405e+05	107	229	0.000e+00	1.615e+05	107	230	0.000e+00	1.195e+05
107	231	0.000e+00	4.715e+05	107	234	0.000e+00	1.747e+05	107	235	0.000e+00	1.815e+05
107	236	0.000e+00	2.200e+05	107	237	0.000e+00	6.930e+04	107	238	0.000e+00	9.832e+03
107	239	0.000e+00	3.893e+05	107	240	0.000e+00	3.132e+04	107	241	0.000e+00	1.242e+05
108	112	7.290e-02	3.165e+07	108	113	2.528e-01	1.123e+08	108	116	1.892e-01	9.423e+07
108	117	1.723e+00	6.210e+08	108	119	2.874e-02	1.107e+07	108	120	2.511e+00	7.716e+08
108	123	9.044e-01	6.568e+08	108	136	2.852e-03	6.114e+06	108	137	1.665e-02	3.623e+07
108	139	4.143e-02	6.515e+07	108	140	2.100e-03	4.830e+06	108	141	5.047e-03	8.380e+06
108	142	7.972e-02	1.046e+08	108	143	4.198e-02	1.020e+08	108	149	0.000e+00	1.048e+04
108	150	0.000e+00	1.825e+04	108	152	0.000e+00	2.978e+03	108	153	0.000e+00	2.305e+04
108	162	4.769e-03	7.533e+06	108	171	0.000e+00	1.413e+04	108	175	3.383e-02	5.865e+07
108	181	0.000e+00	1.465e+04	108	182	0.000e+00	3.904e+04	108	184	0.000e+00	2.983e+04
108	186	0.000e+00	3.427e+04	108	192	7.899e-03	1.860e+07	108	201	5.408e-03	1.917e+07
108	203	5.753e-03	2.944e+07	108	216	4.670e-02	6.726e+08	108	217	3.191e-01	3.288e+09
108	218	3.790e-04	5.502e+06	108	219	2.478e-02	2.575e+08	108	220	5.805e-01	4.706e+09
108	221	1.632e-01	2.426e+09	108	227	0.000e+00	3.645e+04	108	228	0.000e+00	2.223e+05
108	229	0.000e+00	3.830e+05	108	230	0.000e+00	6.048e+03	108	231	0.000e+00	8.891e+04
108	232	0.000e+00	5.598e+05	108	234	0.000e+00	2.331e+05	108	235	0.000e+00	1.946e+04
108	236	0.000e+00	1.408e+05	108	237	0.000e+00	3.750e+05	108	238	0.000e+00	1.672e+04
108	240	0.000e+00	1.896e+05	108	241	0.000e+00	2.050e+05	109	111	5.371e-02	2.492e+07
109	112	7.828e-01	2.503e+08	109	113	1.918e-01	6.302e+07	109	114	2.641e-01	1.522e+08
109	118	1.307e-02	5.250e+06	109	124	2.153e+00	9.690e+08	109	127	4.819e-01	6.543e+08
109	136	1.391e-01	2.614e+08	109	137	3.639e-03	6.948e+06	109	138	4.220e-03	1.354e+07
109	140	4.596e-02	9.307e+07	109	143	6.759e-03	1.451e+07	109	144	0.000e+00	1.519e+04
109	145	1.388e-03	5.039e+06	109	147	1.739e-02	2.808e+07	109	154	0.000e+00	1.673e+04
109	156	1.670e-01	6.811e+08	109	176	7.961e-03	1.598e+07	109	178	1.167e-02	2.402e+07
109	187	0.000e+00	5.111e+04	109	188	0.000e+00	6.857e+04	109	196	1.457e-02	5.908e+07
109	207	0.000e+00	7.896e+04	109	213	0.000e+00	1.161e+04	109	214	2.266e-01	3.077e+09
109	216	1.018e-03	1.394e+07	109	217	1.036e-03	1.015e+07	109	218	2.623e-03	3.624e+07
109	219	6.409e-04	6.338e+06	109	221	5.773e-04	8.170e+06	109	224	6.308e-01	6.486e+09
109	225	9.996e-02	2.446e+09	109	226	0.000e+00	6.726e+05	109	233	0.000e+00	6.613e+05
109	238	0.000e+00	2.873e+05	109	241	0.000e+00	2.407e+04	109	242	0.000e+00	3.241e+05
109	261	0.000e+00	1.205e+04	109	265	0.000e+00	4.299e+04	109	269	0.000e+00	7.977e+03
109	275	3.547e-03	5.003e+07	109	280	0.000e+00	1.764e+04	109	281	0.000e+00	2.039e+05

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
109	283	1.563e-03	5.351e+07	110	125	9.623e-02	1.904e+07	110	126	7.477e-01	1.769e+08
110	130	1.272e-01	3.725e+07	110	137	0.000e+00	6.441e+03	110	148	7.393e-03	1.229e+07
110	171	3.589e-03	7.588e+06	110	184	1.713e-02	5.061e+07	110	210	5.874e-01	7.886e+09
110	218	0.000e+00	1.064e+04	110	227	5.775e-03	1.262e+08	110	234	1.276e-03	2.880e+07
110	240	6.438e-03	1.521e+08	110	247	0.000e+00	1.518e+04	110	263	0.000e+00	2.483e+04
110	272	0.000e+00	1.524e+04	111	125	5.428e-01	1.047e+08	111	128	1.392e+00	2.009e+08
111	129	3.370e-01	2.647e+08	111	130	3.100e-01	8.895e+07	111	132	1.131e-01	2.154e+07
111	133	5.690e-02	1.952e+07	111	134	1.208e-01	3.138e+07	111	135	4.317e-02	7.060e+07
111	136	0.000e+00	4.350e+03	111	138	0.000e+00	6.093e+03	111	139	0.000e+00	6.418e+03
111	148	1.162e-02	1.916e+07	111	149	1.184e-02	1.173e+07	111	154	1.309e-02	2.283e+07
111	171	1.013e-02	2.124e+07	111	184	9.127e-03	2.678e+07	111	185	2.058e-02	1.812e+08
111	186	2.272e-02	4.005e+07	111	187	2.853e-03	5.101e+06	111	207	1.765e-03	2.525e+07
111	210	3.268e-01	4.373e+09	111	211	1.157e+00	9.304e+09	111	213	3.023e-01	2.489e+09
111	218	0.000e+00	4.898e+03	111	219	0.000e+00	1.498e+04	111	224	0.000e+00	1.301e+04
111	227	5.795e-03	1.264e+08	111	228	1.030e-02	1.348e+08	111	233	4.032e-03	8.872e+07
111	234	3.080e-03	6.937e+07	111	235	5.182e-04	7.038e+06	111	238	1.527e-02	2.154e+08
111	239	6.448e-03	4.558e+08	111	240	3.690e-03	8.697e+07	111	241	2.701e-03	3.821e+07
111	247	0.000e+00	2.172e+04	111	248	0.000e+00	1.504e+04	111	250	0.000e+00	1.720e+04
111	262	0.000e+00	5.604e+04	111	264	0.000e+00	1.782e+04	111	272	0.000e+00	3.367e+04
111	273	0.000e+00	1.971e+04	111	281	1.222e-03	9.598e+07	111	283	0.000e+00	2.397e+04
112	130	2.691e-02	6.377e+06	112	131	3.742e-01	3.909e+07	112	132	3.189e-01	5.068e+07
112	133	1.544e-01	4.450e+07	112	134	3.343e-02	7.442e+06	112	142	0.000e+00	1.291e+03
112	144	1.514e+00	8.952e+08	112	149	1.154e-02	1.058e+07	112	151	7.132e-03	4.791e+06
112	154	2.706e-01	4.376e+08	112	171	1.159e-02	2.270e+07	112	181	8.790e-03	8.280e+06
112	183	7.096e-02	9.556e+07	112	184	2.027e-02	5.613e+07	112	186	1.387e-01	2.308e+08
112	187	8.713e-01	1.471e+09	112	211	1.145e-01	8.963e+08	112	212	4.957e-01	2.776e+09
112	213	6.728e-01	5.393e+09	112	214	0.000e+00	1.606e+05	112	218	0.000e+00	4.331e+03
112	220	0.000e+00	9.253e+03	112	224	0.000e+00	1.868e+05	112	225	0.000e+00	5.979e+04
112	226	2.884e-01	2.611e+09	112	227	2.770e-04	5.914e+06	112	228	2.989e-03	3.831e+07
112	229	2.982e-03	2.733e+07	112	230	2.312e-03	2.130e+07	112	233	3.820e-02	8.232e+08
112	234	2.132e-03	4.703e+07	112	235	3.919e-04	5.213e+06	112	236	1.829e-03	1.739e+07
112	238	9.536e-02	1.319e+09	112	240	4.184e-03	9.663e+07	112	243	0.000e+00	6.172e+05
112	248	0.000e+00	1.178e+04	112	250	0.000e+00	4.162e+05	112	261	1.683e-03	1.787e+07
112	263	0.000e+00	1.995e+04	112	264	0.000e+00	2.759e+04	112	272	0.000e+00	1.355e+04
112	273	0.000e+00	4.150e+04	112	274	0.000e+00	4.851e+04	112	275	0.000e+00	6.160e+05
112	280	7.756e-04	1.190e+07	112	283	0.000e+00	1.574e+05	113	128	5.249e-02	5.870e+06
113	130	1.217e-01	2.768e+07	113	131	1.659e+00	1.664e+08	113	132	1.242e+00	1.899e+08
113	133	6.715e-01	1.864e+08	113	134	4.752e-02	1.024e+07	113	141	0.000e+00	5.248e+03
113	142	0.000e+00	5.603e+03	113	144	3.458e-01	2.010e+08	113	145	0.000e+00	5.797e+03
113	146	0.000e+00	6.711e+03	113	148	7.088e-03	1.064e+07	113	149	1.924e-02	1.735e+07
113	150	4.780e-02	3.095e+07	113	151	2.513e-03	1.662e+06	113	154	5.902e-02	9.395e+07
113	171	3.376e-02	6.519e+07	113	181	5.255e-03	4.883e+06	113	183	2.225e-02	2.956e+07
113	184	4.890e-02	1.338e+08	113	186	3.972e-02	6.530e+07	113	187	2.765e-01	4.613e+08
113	210	3.034e-02	3.931e+08	113	211	2.631e-01	2.047e+09	113	212	2.085e+00	1.161e+10

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
113	213	1.942e-01	1.548e+09	113	214	0.000e+00	3.628e+04	113	217	0.000e+00	1.363e+04
113	220	0.000e+00	2.939e+04	113	224	0.000e+00	4.198e+04	113	225	0.000e+00	1.447e+04
113	226	6.399e-02	5.767e+08	113	227	1.888e-03	4.013e+07	113	228	7.371e-03	9.407e+07
113	229	3.186e-02	2.907e+08	113	230	8.199e-04	7.520e+06	113	233	8.032e-03	1.723e+08
113	234	8.735e-03	1.919e+08	113	235	1.100e-03	1.457e+07	113	236	1.127e-03	1.067e+07
113	238	8.479e-03	1.168e+08	113	240	1.296e-02	2.980e+08	113	241	4.051e-02	5.594e+08
113	243	0.000e+00	1.391e+05	113	247	0.000e+00	1.469e+04	113	248	0.000e+00	1.979e+04
113	249	0.000e+00	3.974e+04	113	250	0.000e+00	9.124e+04	113	262	0.000e+00	2.573e+04
113	263	0.000e+00	4.457e+04	113	264	0.000e+00	3.684e+04	113	272	0.000e+00	5.321e+04
113	273	0.000e+00	1.087e+05	113	274	0.000e+00	1.525e+05	113	275	0.000e+00	1.564e+05
113	283	0.000e+00	3.788e+04	114	125	1.510e-01	1.970e+07	114	126	1.543e-01	2.505e+07
114	128	1.008e-01	1.029e+07	114	129	2.068e-02	1.167e+07	114	130	4.130e-01	8.646e+07
114	133	5.431e-02	1.400e+07	114	134	1.535e+00	3.096e+08	114	135	4.217e-01	5.515e+08
114	140	0.000e+00	3.283e+03	114	147	0.000e+00	7.205e+03	114	149	1.552e-02	1.356e+07
114	154	6.456e-02	9.966e+07	114	156	0.000e+00	9.955e+03	114	171	5.464e-03	1.026e+07
114	180	2.278e-02	2.877e+07	114	184	1.198e-02	3.203e+07	114	185	1.390e-03	1.115e+07
114	186	3.436e-03	5.518e+06	114	187	4.898e-02	7.985e+07	114	207	1.305e-02	1.736e+08
114	210	1.345e-01	1.724e+09	114	211	1.701e-01	1.309e+09	114	213	1.528e+00	1.205e+10
114	218	0.000e+00	1.021e+04	114	224	0.000e+00	5.664e+04	114	225	0.000e+00	1.480e+04
114	228	6.445e-03	8.156e+07	114	233	2.377e-02	5.059e+08	114	234	1.824e-03	3.973e+07
114	235	3.686e-03	4.842e+07	114	238	4.350e-02	5.943e+08	114	239	1.067e-03	7.301e+07
114	240	2.605e-03	5.943e+07	114	241	1.265e-02	1.733e+08	114	248	0.000e+00	1.669e+04
114	250	0.000e+00	9.008e+04	114	263	0.000e+00	1.095e+04	114	272	0.000e+00	1.692e+04
114	275	0.000e+00	4.080e+04	114	280	8.403e-04	1.274e+07	114	281	6.281e-03	4.783e+08
114	283	0.000e+00	1.293e+05	115	129	1.190e-02	5.871e+06	115	134	2.328e-02	4.252e+06
115	135	9.568e-03	1.147e+07	115	148	4.565e-01	6.332e+08	115	149	1.281e-01	1.067e+08
115	159	1.123e-02	1.047e+07	115	173	2.306e-02	2.550e+07	115	174	1.097e-02	2.063e+07
115	180	1.449e+00	1.759e+09	115	183	1.047e-01	1.303e+08	115	184	9.758e-02	2.519e+08
115	185	1.699e-01	1.316e+09	115	186	3.141e-03	4.873e+06	115	210	3.381e-01	4.266e+09
115	211	1.268e-01	9.612e+08	115	213	3.249e-02	2.523e+08	115	215	0.000e+00	5.916e+04
115	216	0.000e+00	4.671e+04	115	218	0.000e+00	1.428e+05	115	219	0.000e+00	5.751e+04
115	221	0.000e+00	9.027e+03	115	222	0.000e+00	3.834e+04	115	227	6.549e-02	1.364e+09
115	228	2.005e-02	2.507e+08	115	233	1.910e-03	4.015e+07	115	235	2.748e-01	3.567e+09
115	238	7.979e-04	1.077e+07	115	239	1.607e-02	1.087e+09	115	240	8.626e-03	1.945e+08
115	247	0.000e+00	4.561e+05	115	248	0.000e+00	1.506e+05	115	252	0.000e+00	5.133e+05
115	262	0.000e+00	2.260e+05	115	263	0.000e+00	1.680e+05	115	264	0.000e+00	1.034e+04
115	267	5.438e-04	7.920e+06	115	273	0.000e+00	6.657e+04	116	132	4.141e-02	5.124e+06
116	148	1.954e-01	2.695e+08	116	149	6.164e-01	5.110e+08	116	150	1.265e-01	7.531e+07
116	151	9.575e-02	5.825e+07	116	155	2.565e-02	1.652e+07	116	172	1.560e-02	1.203e+07
116	180	4.853e-01	5.868e+08	116	181	2.071e+00	1.795e+09	116	183	2.196e-02	2.723e+07
116	184	3.403e-01	8.751e+08	116	186	9.008e-02	1.392e+08	116	187	5.991e-03	9.399e+06
116	210	3.946e-02	4.970e+08	116	211	7.047e-01	5.331e+09	116	212	5.745e-02	3.110e+08
116	213	3.039e-03	2.356e+07	116	215	0.000e+00	5.788e+04	116	216	0.000e+00	8.366e+04
116	217	0.000e+00	3.677e+04	116	218	0.000e+00	4.595e+04	116	219	0.000e+00	1.586e+05

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
116	220	0.000e+00	4.115e+04	116	221	0.000e+00	3.932e+04	116	222	0.000e+00	2.208e+04
116	223	0.000e+00	2.111e+04	116	227	2.866e-02	5.961e+08	116	228	8.660e-02	1.081e+09
116	229	2.364e-02	2.110e+08	116	230	2.090e-02	1.875e+08	116	235	8.175e-02	1.060e+09
116	236	3.688e-01	3.417e+09	116	240	3.048e-02	6.864e+08	116	241	9.493e-03	1.283e+08
116	244	0.000e+00	4.217e+04	116	247	0.000e+00	3.812e+05	116	248	0.000e+00	3.190e+05
116	249	0.000e+00	1.244e+05	116	252	0.000e+00	2.757e+05	116	254	0.000e+00	4.663e+05
116	262	0.000e+00	3.152e+05	116	263	0.000e+00	1.337e+05	116	264	0.000e+00	1.207e+05
116	268	7.692e-04	7.992e+06	116	272	0.000e+00	3.795e+04	116	273	0.000e+00	2.766e+04
116	274	0.000e+00	1.901e+05	117	132	5.386e-02	6.492e+06	117	149	2.192e-01	1.799e+08
117	150	1.091e+00	6.432e+08	117	151	4.792e-03	2.886e+06	117	152	1.709e-01	8.084e+07
117	172	1.254e-02	9.585e+06	117	179	6.100e-02	3.970e+07	117	180	2.551e-02	3.060e+07
117	181	5.754e-01	4.945e+08	117	182	2.981e+00	2.002e+09	117	186	5.917e-01	9.075e+08
117	187	1.617e-02	2.519e+07	117	188	6.981e-03	6.289e+06	117	211	2.023e-02	1.526e+08
117	212	1.093e+00	5.897e+09	117	216	0.000e+00	3.947e+04	117	217	0.000e+00	1.860e+05
117	219	0.000e+00	2.274e+04	117	220	0.000e+00	2.187e+05	117	221	0.000e+00	7.056e+04
117	222	0.000e+00	4.977e+03	117	226	8.858e-04	7.789e+06	117	228	3.295e-02	4.103e+08
117	229	1.591e-01	1.417e+09	117	230	1.639e-03	1.467e+07	117	231	3.188e-02	2.221e+08
117	235	4.020e-03	5.198e+07	117	236	9.323e-02	8.616e+08	117	237	5.395e-01	3.882e+09
117	238	5.282e-03	7.104e+07	117	241	5.179e-02	6.985e+08	117	242	1.327e-03	1.000e+07
117	244	0.000e+00	8.128e+03	117	245	0.000e+00	5.413e+04	117	247	0.000e+00	4.832e+04
117	248	0.000e+00	2.868e+05	117	249	0.000e+00	5.341e+05	117	252	0.000e+00	3.367e+04
117	254	0.000e+00	2.410e+05	117	256	0.000e+00	5.758e+05	117	262	0.000e+00	3.260e+04
117	263	0.000e+00	1.954e+05	117	264	0.000e+00	3.217e+05	117	269	7.795e-04	6.285e+06
117	272	0.000e+00	1.240e+05	117	273	0.000e+00	9.899e+04	118	144	1.280e-02	6.474e+06
118	148	5.788e-02	7.614e+07	118	149	9.428e-02	7.454e+07	118	150	1.781e-02	1.011e+07
118	151	1.793e+00	1.041e+09	118	154	5.724e-03	8.018e+06	118	155	4.440e-01	2.733e+08
118	158	2.572e-01	1.612e+08	118	159	1.507e-02	1.336e+07	118	164	1.491e-01	1.014e+08
118	173	1.033e-02	1.091e+07	118	180	4.749e-01	5.521e+08	118	181	3.357e-01	2.798e+08
118	183	1.723e-02	2.055e+07	118	184	1.388e-02	3.448e+07	118	186	7.005e-03	1.046e+07
118	187	1.091e-02	1.653e+07	118	190	0.000e+00	6.799e+03	118	210	6.698e-01	8.305e+09
118	211	2.565e-02	1.910e+08	118	213	1.201e-02	9.169e+07	118	214	0.000e+00	5.485e+03
118	215	0.000e+00	2.408e+05	118	216	0.000e+00	4.106e+04	118	218	0.000e+00	1.215e+05
118	219	0.000e+00	7.245e+03	118	221	0.000e+00	7.226e+03	118	222	0.000e+00	1.338e+05
118	223	0.000e+00	4.827e+05	118	226	2.069e-03	1.802e+07	118	227	1.108e-02	2.277e+08
118	228	1.636e-02	2.018e+08	118	229	2.574e-03	2.269e+07	118	230	5.758e-01	5.103e+09
118	233	1.229e-03	2.550e+07	118	235	5.866e-02	7.514e+08	118	236	5.134e-02	4.701e+08
118	238	1.987e-03	2.648e+07	118	240	1.365e-03	3.038e+07	118	244	0.000e+00	1.112e+06
118	247	0.000e+00	6.773e+04	118	248	0.000e+00	1.208e+05	118	249	0.000e+00	1.286e+04
118	250	0.000e+00	7.992e+03	118	252	0.000e+00	3.287e+05	118	254	0.000e+00	1.577e+05
118	258	8.071e-03	8.203e+07	118	263	0.000e+00	3.621e+04	118	264	0.000e+00	1.229e+04
118	267	3.668e-04	5.276e+06	118	279	3.509e-04	8.594e+06	119	149	9.281e-02	7.221e+07
119	150	1.396e-01	7.799e+07	119	151	1.540e-01	8.802e+07	119	152	2.827e+00	1.269e+09
119	155	3.158e-02	1.914e+07	119	158	6.948e-02	4.288e+07	119	161	4.144e-01	2.017e+08
119	165	2.189e-01	1.157e+08	119	172	1.366e-02	9.963e+06	119	173	1.194e-02	1.244e+07

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
119	180	6.269e-02	7.193e+07	119	181	6.598e-01	5.426e+08	119	182	4.600e-01	2.957e+08
119	186	2.848e-02	4.201e+07	119	188	5.866e-03	5.088e+06	119	194	0.000e+00	7.806e+03
119	211	9.798e-01	7.260e+09	119	212	9.431e-03	5.001e+07	119	213	5.661e-03	4.300e+07
119	215	0.000e+00	1.216e+05	119	216	0.000e+00	1.982e+05	119	217	0.000e+00	1.550e+04
119	218	0.000e+00	2.259e+04	119	219	0.000e+00	1.039e+05	119	221	0.000e+00	6.575e+04
119	222	0.000e+00	3.040e+05	119	228	1.802e-02	2.214e+08	119	229	2.489e-02	2.185e+08
119	230	4.993e-02	4.407e+08	119	231	7.600e-01	5.223e+09	119	235	9.359e-03	1.194e+08
119	236	8.204e-02	7.481e+08	119	237	7.332e-02	5.206e+08	119	241	3.021e-03	4.021e+07
119	242	9.292e-04	6.913e+06	119	244	0.000e+00	1.451e+05	119	245	0.000e+00	1.136e+06
119	247	0.000e+00	4.286e+04	119	248	0.000e+00	5.275e+04	119	249	0.000e+00	1.425e+05
119	252	0.000e+00	1.156e+05	119	253	8.305e-04	6.528e+06	119	254	0.000e+00	3.096e+05
119	256	0.000e+00	1.679e+05	119	258	6.615e-04	6.698e+06	119	259	1.012e-02	7.978e+07
119	264	0.000e+00	4.983e+04	119	268	5.752e-04	5.887e+06	119	272	0.000e+00	1.037e+04
119	278	5.752e-04	8.415e+06	120	150	2.305e-01	1.260e+08	120	152	1.802e-01	7.918e+07
120	153	4.313e+00	1.571e+09	120	161	8.831e-02	4.211e+07	120	169	3.811e-01	1.649e+08
120	172	1.199e-02	8.578e+06	120	179	3.597e-02	2.199e+07	120	181	8.505e-02	6.871e+07
120	182	1.284e+00	8.111e+08	120	195	0.000e+00	8.668e+03	120	212	1.278e+00	6.731e+09
120	216	0.000e+00	7.804e+04	120	217	0.000e+00	2.428e+05	120	219	0.000e+00	8.666e+03
120	220	0.000e+00	9.033e+04	120	221	0.000e+00	3.164e+05	120	229	4.348e-02	3.798e+08
120	230	6.474e-04	5.684e+06	120	231	5.118e-02	3.498e+08	120	232	1.042e+00	5.839e+09
120	236	1.253e-02	1.136e+08	120	237	1.791e-01	1.265e+09	120	244	0.000e+00	5.905e+03
120	245	0.000e+00	1.248e+05	120	246	0.000e+00	1.312e+06	120	248	0.000e+00	4.568e+04
120	249	0.000e+00	1.697e+05	120	254	0.000e+00	1.118e+05	120	255	1.331e-03	8.523e+06
120	256	0.000e+00	5.459e+05	120	259	6.373e-04	4.997e+06	120	260	1.384e-02	8.885e+07
120	264	0.000e+00	3.884e+04	120	269	8.347e-04	6.613e+06	120	277	9.600e-04	9.976e+06
121	148	2.187e-01	2.141e+08	121	171	1.413e-01	1.882e+08	121	174	9.092e-03	1.273e+07
121	184	3.977e-01	8.001e+08	121	210	2.525e-02	2.858e+08	121	216	0.000e+00	6.924e+03
121	218	0.000e+00	7.341e+04	121	227	4.996e-02	9.562e+08	121	233	8.384e-04	1.621e+07
121	234	2.335e-02	4.627e+08	121	240	4.611e-02	9.587e+08	121	247	0.000e+00	1.465e+05
121	263	0.000e+00	2.645e+05	121	272	0.000e+00	1.514e+05	121	279	1.083e-03	2.487e+07
122	148	1.457e-01	1.426e+08	122	149	5.045e-01	2.966e+08	122	171	4.185e-01	5.569e+08
122	173	1.855e-02	1.520e+07	122	174	7.016e-03	9.816e+06	122	184	3.046e-01	6.126e+08
122	185	3.803e-01	2.295e+09	122	186	4.952e-01	5.984e+08	122	187	4.905e-03	6.031e+06
122	207	1.705e-03	1.825e+07	122	210	1.930e-02	2.183e+08	122	211	3.706e-02	2.518e+08
122	213	1.358e-03	9.473e+06	122	215	0.000e+00	2.996e+04	122	216	0.000e+00	5.414e+03
122	218	0.000e+00	6.761e+04	122	219	0.000e+00	9.781e+04	122	227	3.233e-02	6.187e+08
122	228	1.144e-01	1.314e+09	122	234	6.725e-02	1.332e+09	122	238	8.880e-03	1.105e+08
122	239	4.440e-02	2.769e+09	122	240	3.486e-02	7.248e+08	122	241	4.896e-02	6.112e+08
122	247	0.000e+00	1.227e+05	122	248	0.000e+00	2.173e+05	122	262	0.000e+00	5.285e+05
122	263	0.000e+00	1.075e+05	122	264	0.000e+00	2.142e+05	122	272	0.000e+00	3.970e+05
122	273	0.000e+00	1.759e+05	122	278	2.337e-03	3.217e+07	122	279	7.844e-04	1.801e+07
122	281	1.895e-04	1.322e+07	123	131	2.036e-01	5.201e+06	123	132	9.070e-02	3.826e+06
123	133	7.478e-02	6.176e+06	123	148	8.016e-03	7.786e+06	123	149	1.330e-01	7.765e+07
123	150	9.131e-01	3.832e+08	123	171	6.685e-01	8.842e+08	123	172	2.952e-02	1.680e+07

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
123	184	4.561e-01	9.127e+08	123	186	1.400e+00	1.684e+09	123	187	7.126e-02	8.719e+07
123	205	0.000e+00	1.289e+04	123	210	1.069e-03	1.207e+07	123	211	1.021e-02	6.921e+07
123	212	2.356e-02	1.143e+08	123	213	1.407e-03	9.793e+06	123	215	0.000e+00	1.098e+04
123	216	0.000e+00	2.563e+04	123	217	0.000e+00	2.900e+04	123	218	0.000e+00	8.117e+03
123	219	0.000e+00	4.178e+04	123	220	0.000e+00	1.294e+05	123	227	1.579e-03	3.017e+07
123	228	2.773e-02	3.181e+08	123	229	1.977e-01	1.621e+09	123	234	1.027e-01	2.030e+09
123	238	9.432e-03	1.172e+08	123	240	5.253e-02	1.090e+09	123	241	1.565e-01	1.950e+09
123	247	0.000e+00	1.149e+04	123	248	0.000e+00	7.437e+04	123	249	0.000e+00	2.980e+05
123	262	0.000e+00	8.728e+04	123	263	0.000e+00	2.681e+05	123	264	0.000e+00	4.344e+05
123	272	0.000e+00	4.141e+05	123	273	0.000e+00	7.375e+05	123	274	0.000e+00	8.943e+05
123	277	4.259e-03	4.178e+07	123	278	7.512e-04	1.032e+07	124	134	1.245e-01	7.383e+06
124	144	4.974e-01	1.650e+08	124	151	6.258e-03	2.457e+06	124	155	8.321e-02	3.507e+07
124	164	2.525e-02	1.201e+07	124	179	9.007e-02	4.103e+07	124	186	5.779e-03	6.514e+06
124	187	2.773e-01	3.182e+08	124	188	6.122e+00	4.089e+09	124	209	0.000e+00	3.966e+04
124	211	5.718e-03	3.774e+07	124	212	2.514e-03	1.187e+07	124	213	9.770e-01	6.620e+09
124	214	0.000e+00	2.609e+05	124	224	0.000e+00	1.185e+05	124	225	0.000e+00	4.059e+05
124	226	1.058e-01	8.392e+08	124	229	1.748e-03	1.404e+07	124	231	3.241e-03	2.038e+07
124	238	4.059e-02	4.944e+08	124	241	3.759e-03	4.593e+07	124	242	1.343e+00	9.176e+09
124	243	0.000e+00	5.097e+05	124	244	0.000e+00	4.018e+03	124	250	0.000e+00	3.452e+04
124	265	3.173e-02	2.322e+08	124	269	5.889e-03	4.318e+07	124	275	0.000e+00	2.033e+05
124	280	2.741e-03	3.729e+07	124	282	0.000e+00	1.064e+06	125	136	2.230e+00	5.636e+08
125	137	1.278e-01	3.375e+07	125	138	2.515e-01	1.131e+08	125	145	2.833e-02	1.744e+07
125	156	3.421e-01	2.765e+08	125	214	7.511e-01	5.960e+09	125	215	5.191e-02	6.937e+08
125	216	6.137e-02	4.928e+08	125	218	2.168e-01	1.760e+09	125	221	3.871e-03	3.242e+07
125	222	3.730e-02	5.207e+08	125	223	1.489e-03	6.238e+07	125	225	1.949e-01	2.853e+09
125	247	3.297e-03	3.978e+07	125	250	4.358e-03	5.347e+07	125	262	1.253e-03	2.639e+07
125	283	1.662e-03	3.719e+07	126	136	4.194e-02	9.285e+06	126	137	2.162e+00	5.015e+08
126	140	5.200e-01	1.422e+08	126	143	3.302e-02	1.055e+07	126	156	1.549e-01	1.139e+08
126	214	1.386e-01	1.075e+09	126	215	2.893e-01	3.778e+09	126	216	1.296e-02	1.017e+08
126	218	6.715e-01	5.327e+09	126	222	7.089e-02	9.676e+08	126	223	1.021e-01	4.183e+09
126	225	7.165e-02	1.026e+09	126	247	4.908e-03	5.812e+07	126	250	2.105e-03	2.536e+07
126	262	5.846e-04	1.209e+07	126	263	2.998e-03	3.720e+07	126	272	1.046e-03	1.307e+07
126	283	6.353e-04	1.396e+07	127	154	5.017e-01	3.510e+08	127	180	1.052e-02	6.893e+06
127	183	2.382e-01	1.615e+08	127	185	1.354e-03	6.138e+06	127	186	3.776e-02	3.428e+07
127	187	1.315e+00	1.218e+09	127	207	5.867e-01	5.086e+09	127	210	6.058e-04	6.105e+06
127	213	7.173e-03	4.463e+07	127	214	0.000e+00	3.410e+04	127	224	0.000e+00	1.064e+05
127	233	6.406e-02	1.134e+09	127	234	7.549e-04	1.371e+07	127	238	2.550e-01	2.916e+09
127	241	2.133e-02	2.446e+08	127	250	0.000e+00	5.840e+05	127	275	0.000e+00	2.010e+05
127	280	2.981e-03	3.819e+07	127	281	7.581e-02	4.880e+09	127	283	0.000e+00	7.884e+05
128	136	3.003e-01	6.440e+07	128	137	2.069e-02	4.652e+06	128	138	6.298e-02	2.417e+07
128	139	3.275e+00	5.450e+08	128	140	4.382e-01	1.164e+08	128	141	7.416e-01	1.452e+08
128	143	4.029e-02	1.253e+07	128	145	1.150e-02	6.185e+06	128	214	1.521e-02	1.173e+08
128	215	7.054e-02	9.163e+08	128	216	3.639e-01	2.841e+09	128	218	2.417e-01	1.907e+09
128	219	1.342e+00	7.585e+09	128	221	2.453e-02	1.999e+08	128	222	6.911e-02	9.385e+08

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
128	224	6.535e-02	3.889e+08	128	225	8.678e-04	1.236e+07	128	247	1.447e-03	1.706e+07
128	248	1.254e-02	1.057e+08	128	259	0.000e+00	4.866e+03	128	262	8.373e-04	1.724e+07
128	263	3.295e-03	4.071e+07	128	264	3.264e-03	2.881e+07	129	138	7.799e-01	2.791e+08
129	145	9.385e-02	4.761e+07	129	215	3.995e-01	5.128e+09	129	222	1.298e-01	1.742e+09
129	225	1.064e-02	1.499e+08	129	262	2.073e-03	4.228e+07	130	137	3.073e-01	5.928e+07
130	138	4.779e-01	1.576e+08	130	140	1.334e+00	3.080e+08	130	143	3.590e-01	9.810e+07
130	145	3.665e-02	1.736e+07	130	146	7.433e-02	1.084e+08	130	156	1.531e-01	9.865e+07
130	214	9.693e-02	7.289e+08	130	215	8.660e-02	1.097e+09	130	216	7.986e-01	6.079e+09
130	218	7.328e-02	5.640e+08	130	221	1.642e-03	1.305e+07	130	222	2.444e-01	3.238e+09
130	223	1.571e-01	6.245e+09	130	225	5.232e-02	7.277e+08	130	247	8.764e-04	1.012e+07
130	250	1.272e-03	1.495e+07	130	262	2.791e-03	5.632e+07	130	263	2.692e-03	3.260e+07
130	272	2.982e-03	3.636e+07	130	283	4.905e-04	1.053e+07	131	139	7.428e-02	1.039e+07
131	140	5.408e-02	1.221e+07	131	141	1.293e+00	2.157e+08	131	142	5.387e+00	7.348e+08
131	143	1.509e-01	4.041e+07	131	192	1.747e-02	1.005e+07	131	216	5.533e-02	4.196e+08
131	217	4.280e-01	2.324e+09	131	218	1.005e-02	7.707e+07	131	219	2.727e-01	1.498e+09
131	220	2.161e+00	9.268e+09	131	221	4.050e-02	3.207e+08	131	237	0.000e+00	7.681e+03
131	248	1.564e-03	1.287e+07	131	249	2.167e-02	1.388e+08	131	260	0.000e+00	6.173e+03
131	263	1.392e-03	1.681e+07	131	264	1.089e-02	9.389e+07	132	137	1.211e-01	2.112e+07
132	138	2.044e-02	6.103e+06	132	139	5.350e-01	6.942e+07	132	140	3.442e-01	7.250e+07
132	141	1.927e+00	3.003e+08	132	143	1.049e+00	2.635e+08	132	145	3.874e-01	1.690e+08
132	214	2.393e-02	1.772e+08	132	215	1.758e-03	2.193e+07	132	216	1.015e-01	7.609e+08
132	217	1.761e+00	9.451e+09	132	218	6.799e-03	5.152e+07	132	219	4.431e-02	2.405e+08
132	221	5.259e-01	4.117e+09	132	222	1.278e-01	1.668e+09	132	224	1.239e-02	7.089e+07
132	248	1.372e-03	1.118e+07	132	263	3.348e-03	4.005e+07	132	264	6.531e-03	5.580e+07
132	272	1.982e-03	2.387e+07	132	273	6.410e-04	1.288e+07	133	143	1.215e+00	2.846e+08
133	145	1.221e+00	4.974e+08	133	146	5.199e-01	6.530e+08	133	156	3.799e-02	2.152e+07
133	214	7.836e-03	5.727e+07	133	215	4.391e-02	5.407e+08	133	216	1.544e-01	1.143e+09
133	218	1.153e-03	8.626e+06	133	221	9.311e-01	7.199e+09	133	222	2.455e-01	3.164e+09
133	223	4.973e-02	1.923e+09	133	225	1.073e-02	1.453e+08	133	272	1.629e-02	1.942e+08
133	273	1.257e-02	2.500e+08	133	274	4.658e-03	2.781e+08	133	277	0.000e+00	4.409e+03
133	278	0.000e+00	8.163e+03	133	279	0.000e+00	1.174e+04	134	136	2.331e-01	2.590e+07
134	140	1.570e-01	2.336e+07	134	143	8.371e-02	1.533e+07	134	147	3.375e+00	5.242e+08
134	156	1.593e-01	7.376e+07	134	176	2.329e-02	6.795e+06	134	178	2.582e-02	8.052e+06
134	213	0.000e+00	6.593e+03	134	214	6.300e-01	4.416e+09	134	215	3.682e-03	4.349e+07
134	216	3.207e-02	2.276e+08	134	217	1.238e-02	6.290e+07	134	219	4.051e-02	2.083e+08
134	221	2.418e-02	1.795e+08	134	222	6.667e-03	8.250e+07	134	224	1.731e+00	9.397e+09
134	225	3.857e-02	5.018e+08	134	226	0.000e+00	3.232e+04	134	233	0.000e+00	1.226e+04
134	242	0.000e+00	7.055e+03	134	250	1.365e-02	1.517e+08	134	261	0.000e+00	1.748e+04
134	265	0.000e+00	1.690e+04	134	269	0.000e+00	5.334e+03	134	275	3.220e-02	2.669e+08
134	280	0.000e+00	5.526e+03	134	281	0.000e+00	2.312e+04	134	283	5.400e-04	1.099e+07
135	156	8.148e-01	2.934e+08	135	215	6.141e-03	6.918e+07	135	225	6.895e-01	8.577e+09
135	238	0.000e+00	5.757e+03	135	280	0.000e+00	1.962e+04	135	283	1.436e-02	2.819e+08
136	151	1.930e-01	3.731e+06	136	155	1.209e+00	3.161e+07	136	183	1.338e-01	1.688e+07
136	187	2.627e-02	6.417e+06	136	226	9.891e-01	5.362e+09	136	227	1.125e-02	1.442e+08

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
136	228	5.905e-02	4.547e+08	136	229	3.996e-03	2.200e+07	136	230	3.354e-01	1.859e+09
136	233	1.782e-01	2.312e+09	136	234	2.378e-02	3.182e+08	136	235	8.768e-02	7.083e+08
136	236	4.524e-02	2.612e+08	136	238	5.793e-01	4.917e+09	136	240	2.209e-02	3.134e+08
136	241	2.634e-03	2.244e+07	136	258	6.181e-03	4.068e+07	136	261	9.712e-03	6.455e+07
136	267	1.720e-03	1.606e+07	136	277	1.168e-03	7.988e+06	136	280	1.186e-02	1.148e+08
137	151	1.259e-01	2.117e+06	137	158	1.352e+00	3.437e+07	137	210	1.851e-03	1.209e+07
137	211	1.369e-02	5.375e+07	137	212	9.101e-03	2.558e+07	137	226	1.681e-02	9.040e+07
137	227	2.323e-01	2.956e+09	137	228	5.278e-01	4.032e+09	137	229	4.666e-03	2.549e+07
137	230	4.749e-01	2.612e+09	137	233	1.565e-02	2.016e+08	137	234	4.474e-02	5.938e+08
137	235	3.472e-01	2.783e+09	137	236	3.217e-01	1.843e+09	137	238	1.670e-02	1.407e+08
137	240	1.925e-01	2.709e+09	137	247	0.000e+00	6.359e+03	137	248	0.000e+00	6.676e+03
137	258	6.118e-03	3.996e+07	137	268	5.438e-03	3.601e+07	137	277	3.694e-03	2.507e+07
137	278	5.240e-04	4.984e+06	138	159	8.767e-01	3.094e+07	138	185	6.442e-03	7.036e+06
138	207	3.364e-03	1.164e+07	138	210	1.285e-02	8.346e+07	138	211	8.490e-03	3.313e+07
138	227	5.764e-01	7.304e+09	138	228	6.272e-02	4.772e+08	138	233	6.141e-03	7.876e+07
138	234	1.479e-02	1.955e+08	138	235	5.029e-01	4.015e+09	138	238	2.478e-03	2.079e+07
138	239	1.200e-01	5.048e+09	138	240	2.179e-02	3.056e+08	138	241	8.047e-04	6.776e+06
138	247	0.000e+00	1.234e+04	138	252	0.000e+00	1.347e+04	138	267	4.369e-03	4.035e+07
138	278	2.192e-03	2.078e+07	138	279	6.404e-04	1.012e+07	138	281	4.066e-03	1.958e+08
139	152	1.782e-01	2.205e+06	139	161	1.750e+00	3.380e+07	139	211	1.824e-03	7.096e+06
139	212	2.694e-02	7.504e+07	139	213	5.190e-03	2.090e+07	139	226	8.429e-02	4.504e+08
139	228	2.680e-01	2.035e+09	139	229	6.018e-01	3.267e+09	139	230	5.848e-02	3.196e+08
139	231	8.539e-01	3.634e+09	139	235	3.205e-02	2.553e+08	139	236	4.802e-01	2.734e+09
139	237	3.988e-01	1.769e+09	139	238	3.100e-02	2.596e+08	139	241	1.325e-01	1.113e+09
139	242	3.897e-02	1.833e+08	139	249	0.000e+00	7.805e+03	139	253	7.500e-04	3.781e+06
139	256	0.000e+00	1.275e+04	139	259	1.123e-02	5.676e+07	139	265	1.219e-03	6.231e+06
139	268	1.224e-03	8.055e+06	139	269	5.119e-03	2.622e+07	139	277	2.903e-03	1.960e+07
140	164	1.237e+00	3.082e+07	140	210	2.930e-03	1.835e+07	140	211	5.073e-03	1.909e+07
140	212	2.228e-03	6.004e+06	140	226	2.859e-01	1.491e+09	140	227	2.994e-03	3.696e+07
140	228	3.061e-01	2.269e+09	140	229	1.645e-02	8.718e+07	140	230	7.667e-01	4.091e+09
140	233	5.760e-02	7.198e+08	140	234	5.148e-03	6.635e+07	140	235	8.158e-02	6.349e+08
140	236	4.102e-01	2.282e+09	140	238	1.991e-01	1.630e+09	140	240	6.003e-02	8.212e+08
140	241	3.711e-03	3.049e+07	140	258	8.953e-03	5.690e+07	140	261	6.131e-03	3.936e+07
140	267	4.248e-03	3.831e+07	140	268	1.015e-03	6.538e+06	140	277	7.345e-04	4.853e+06
140	278	6.578e-04	6.090e+06	140	279	5.152e-04	7.956e+06	140	280	4.598e-03	4.303e+07
141	165	1.597e+00	3.032e+07	141	211	4.854e-03	1.811e+07	141	212	1.689e-02	4.512e+07
141	229	7.095e-01	3.738e+09	141	230	8.592e-02	4.558e+08	141	231	1.123e+00	4.640e+09
141	235	1.856e-02	1.436e+08	141	236	1.293e-01	7.154e+08	141	237	7.869e-01	3.390e+09
141	238	4.257e-03	3.465e+07	141	241	1.248e-01	1.019e+09	141	242	6.189e-03	2.830e+07
141	249	0.000e+00	7.584e+03	141	253	1.224e-03	6.002e+06	141	258	7.468e-04	4.720e+06
141	259	1.499e-02	7.375e+07	141	267	5.053e-04	4.533e+06	141	268	7.519e-03	4.818e+07
141	269	2.829e-03	1.410e+07	141	277	2.087e-03	1.372e+07	141	278	1.041e-03	9.589e+06
142	169	2.316e+00	3.510e+07	142	229	1.621e-01	8.463e+08	142	230	1.950e-03	1.025e+07
142	231	1.451e-01	5.941e+08	142	232	2.681e+00	8.999e+09	142	236	5.067e-02	2.778e+08

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
142	237	7.947e-01	3.393e+09	142	246	0.000e+00	2.629e+03	142	255	3.707e-03	1.477e+07
142	259	1.505e-03	7.343e+06	142	260	3.860e-02	1.542e+08	142	265	1.794e-03	8.851e+06
142	268	6.547e-04	4.161e+06	142	269	1.040e-02	5.143e+07	142	277	7.590e-04	4.948e+06
143	172	1.198e+00	2.960e+07	143	173	3.080e-01	1.185e+07	143	210	1.137e-03	6.814e+06
143	211	8.652e-03	3.115e+07	143	212	9.034e-03	2.330e+07	143	226	2.343e-02	1.184e+08
143	228	1.152e-02	8.275e+07	143	229	9.201e-01	4.727e+09	143	233	4.632e-03	5.611e+07
143	234	5.580e-01	6.974e+09	143	235	6.280e-03	4.740e+07	143	236	7.223e-02	3.898e+08
143	238	4.840e-03	3.846e+07	143	240	1.140e-01	1.514e+09	143	241	7.775e-01	6.200e+09
143	277	3.090e-02	1.985e+08	143	278	8.280e-03	7.455e+07	143	279	7.702e-04	1.157e+07
143	280	1.181e-03	1.074e+07	144	189	9.917e-01	1.023e+08	144	196	6.552e-02	1.899e+07
144	206	4.915e-01	1.874e+08	144	213	0.000e+00	6.438e+04	144	214	6.391e-01	3.120e+09
144	217	1.572e-03	5.581e+06	144	218	5.011e-03	2.518e+07	144	224	3.130e-01	1.202e+09
144	226	0.000e+00	7.746e+03	144	233	0.000e+00	7.151e+04	144	238	0.000e+00	8.632e+04
144	241	0.000e+00	5.140e+03	144	242	0.000e+00	3.663e+04	144	243	2.686e+00	1.208e+10
144	244	2.687e-02	1.217e+08	144	250	3.603e-02	3.021e+08	144	251	0.000e+00	8.711e+05
144	252	4.451e-03	2.722e+07	144	255	0.000e+00	1.866e+04	144	261	0.000e+00	1.264e+05
144	264	1.084e-02	6.726e+07	144	265	0.000e+00	4.675e+05	144	269	0.000e+00	7.105e+04
144	275	9.610e-01	6.049e+09	144	280	0.000e+00	9.664e+03	145	173	6.443e-01	2.223e+07
145	174	2.957e-01	1.904e+07	145	210	5.822e-03	3.450e+07	145	211	5.198e-03	1.851e+07
145	227	5.295e-02	6.286e+08	145	228	5.037e-01	3.590e+09	145	233	8.629e-03	1.037e+08
145	234	3.402e-01	4.220e+09	145	235	2.580e-02	1.933e+08	145	238	3.072e-02	2.423e+08
145	239	1.398e-01	5.526e+09	145	240	1.835e-01	2.419e+09	145	241	2.196e-01	1.739e+09
145	278	1.847e-02	1.651e+08	145	279	8.255e-03	1.231e+08	145	281	1.719e-03	7.811e+07
146	174	3.194e-01	1.917e+07	146	210	3.434e-03	2.020e+07	146	227	1.825e-01	2.156e+09
146	233	2.970e-03	3.552e+07	146	234	1.179e-01	1.455e+09	146	240	2.015e-01	2.643e+09
146	279	9.452e-03	1.403e+08	147	179	1.854e+00	3.945e+07	147	187	4.675e-02	6.101e+06
147	188	9.746e-02	8.097e+06	147	213	7.597e-02	2.723e+08	147	214	0.000e+00	1.820e+04
147	225	0.000e+00	6.854e+03	147	226	1.031e+00	5.061e+09	147	228	1.314e-02	9.172e+07
147	229	2.987e-02	1.491e+08	147	230	1.906e-03	9.579e+06	147	231	8.387e-02	3.283e+08
147	235	3.230e-03	2.371e+07	147	236	3.977e-02	2.087e+08	147	237	3.288e-03	1.344e+07
147	238	9.094e-02	7.031e+08	147	241	2.106e-02	1.634e+08	147	242	9.292e-01	4.037e+09
147	243	0.000e+00	4.864e+04	147	258	1.573e-03	9.466e+06	147	259	1.126e-03	5.273e+06
147	265	2.354e-03	1.115e+07	147	269	1.423e-03	6.754e+06	147	280	6.161e-03	5.466e+07
147	282	0.000e+00	1.403e+05	148	191	4.783e-01	9.370e+07	148	200	2.125e-01	1.322e+08
148	202	6.415e-02	2.411e+07	148	205	2.465e-02	5.211e+07	148	210	0.000e+00	1.275e+04
148	211	0.000e+00	1.272e+04	148	214	1.047e-03	4.897e+06	148	215	1.529e-01	1.208e+09
148	216	5.255e-02	2.496e+08	148	218	4.487e-03	2.161e+07	148	221	3.221e-03	1.616e+07
148	222	5.782e-02	4.835e+08	148	223	8.463e-02	2.124e+09	148	230	0.000e+00	1.979e+04
148	234	0.000e+00	4.300e+04	148	235	0.000e+00	2.470e+04	148	236	0.000e+00	8.974e+03
148	240	0.000e+00	3.334e+04	148	241	0.000e+00	6.147e+03	148	247	1.250e+00	9.937e+09
148	258	0.000e+00	5.254e+05	148	262	3.502e-01	4.909e+09	148	263	1.049e-01	8.821e+08
148	267	0.000e+00	3.250e+05	148	268	0.000e+00	8.409e+04	148	273	6.532e-03	9.243e+07
148	274	2.406e-02	1.022e+09	148	278	0.000e+00	5.285e+04	148	279	0.000e+00	6.160e+04
148	283	1.322e-03	1.996e+07	149	191	8.371e-02	1.634e+07	149	193	7.146e-01	1.008e+08

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
149	200	5.857e-02	3.635e+07	149	201	6.952e-02	1.857e+07	149	202	3.248e-01	1.218e+08
149	204	6.515e-02	4.547e+07	149	210	0.000e+00	2.139e+04	149	211	0.000e+00	9.075e+03
149	212	0.000e+00	1.035e+04	149	215	4.288e-02	3.386e+08	149	216	2.271e-01	1.078e+09
149	217	5.438e-02	1.850e+08	149	218	8.016e-03	3.858e+07	149	219	6.332e-03	2.185e+07
149	221	5.377e-02	2.696e+08	149	222	1.966e-01	1.643e+09	149	230	0.000e+00	5.916e+03
149	231	0.000e+00	2.158e+04	149	234	0.000e+00	7.107e+04	149	235	0.000e+00	1.795e+04
149	236	0.000e+00	2.181e+04	149	237	0.000e+00	7.560e+03	149	239	0.000e+00	7.679e+04
149	240	0.000e+00	5.875e+03	149	241	0.000e+00	2.476e+04	149	247	2.213e-01	1.758e+09
149	248	1.855e+00	1.053e+10	149	253	0.000e+00	3.969e+04	149	258	0.000e+00	1.095e+05
149	259	0.000e+00	5.269e+05	149	262	9.555e-02	1.339e+09	149	263	5.495e-01	4.621e+09
149	264	1.042e-01	6.260e+08	149	265	0.000e+00	5.725e+03	149	267	0.000e+00	2.179e+05
149	268	0.000e+00	3.159e+05	149	269	0.000e+00	5.904e+04	149	272	2.780e-03	2.357e+07
149	273	6.977e-02	9.867e+08	149	277	0.000e+00	4.266e+04	149	278	0.000e+00	5.093e+04
149	279	0.000e+00	1.024e+05	150	190	5.305e-02	5.655e+06	150	192	9.783e-01	1.054e+08
150	193	8.460e-02	1.180e+07	150	201	5.684e-01	1.506e+08	150	202	6.763e-02	2.517e+07
150	203	1.056e-01	4.374e+07	150	211	0.000e+00	1.387e+04	150	212	0.000e+00	2.492e+04
150	216	3.762e-02	1.782e+08	150	217	3.799e-01	1.289e+09	150	218	2.688e-03	1.291e+07
150	219	1.269e-02	4.370e+07	150	220	1.541e-02	4.149e+07	150	221	3.645e-01	1.823e+09
150	231	0.000e+00	4.362e+03	150	232	0.000e+00	2.638e+04	150	234	0.000e+00	9.689e+04
150	236	0.000e+00	1.414e+04	150	237	0.000e+00	3.599e+04	150	240	0.000e+00	3.712e+04
150	241	0.000e+00	4.098e+04	150	243	2.227e-03	9.661e+06	150	244	1.157e-03	5.057e+06
150	247	5.452e-03	4.324e+07	150	248	2.178e-01	1.234e+09	150	249	2.670e+00	1.178e+10
150	253	0.000e+00	4.521e+03	150	255	0.000e+00	5.928e+04	150	258	0.000e+00	5.054e+03
150	259	0.000e+00	6.940e+04	150	260	0.000e+00	5.791e+05	150	263	8.684e-02	7.289e+08
150	264	9.285e-01	5.568e+09	150	265	0.000e+00	7.179e+04	150	267	0.000e+00	2.001e+04
150	268	0.000e+00	1.622e+05	150	269	0.000e+00	4.288e+05	150	272	1.354e-01	1.146e+09
150	275	1.114e-02	6.780e+07	150	277	0.000e+00	1.310e+05	150	278	0.000e+00	7.240e+04
150	279	0.000e+00	1.177e+04	151	190	4.026e-01	4.098e+07	151	197	1.326e-01	3.129e+07
151	210	0.000e+00	4.173e+04	151	211	0.000e+00	6.712e+03	151	214	3.850e-03	1.779e+07
151	216	6.854e-03	3.217e+07	151	218	6.448e-01	3.069e+09	151	219	4.928e-02	1.681e+08
151	227	0.000e+00	1.538e+04	151	230	0.000e+00	6.873e+04	151	231	0.000e+00	1.059e+04
151	235	0.000e+00	6.731e+04	151	236	0.000e+00	1.283e+04	151	243	4.092e-02	1.763e+08
151	244	1.079e+00	4.683e+09	151	247	1.090e-02	8.579e+07	151	248	2.348e-02	1.321e+08
151	250	2.212e-02	1.778e+08	151	252	1.012e+00	5.936e+09	151	253	0.000e+00	1.869e+05
151	254	2.084e-02	9.523e+07	151	255	0.000e+00	3.243e+04	151	258	0.000e+00	2.554e+04
151	260	0.000e+00	4.807e+03	151	263	3.861e-03	3.219e+07	151	264	4.969e-03	2.959e+07
151	266	0.000e+00	8.100e+05	151	275	1.862e-02	1.125e+08	152	190	3.239e-02	3.230e+06
152	194	7.793e-01	6.589e+07	152	199	2.094e-01	3.846e+07	152	211	0.000e+00	4.225e+04
152	217	1.442e-02	4.829e+07	152	219	1.003e+00	3.410e+09	152	220	5.484e-02	1.457e+08
152	228	0.000e+00	1.665e+04	152	230	0.000e+00	1.661e+04	152	231	0.000e+00	7.196e+04
152	232	0.000e+00	9.671e+03	152	235	0.000e+00	1.588e+04	152	236	0.000e+00	6.559e+04
152	237	0.000e+00	1.243e+04	152	243	1.555e-02	6.679e+07	152	244	7.751e-02	3.354e+08
152	245	2.195e+00	7.781e+09	152	248	1.439e-03	8.074e+06	152	249	4.210e-02	1.838e+08
152	251	0.000e+00	7.340e+03	152	252	5.694e-02	3.331e+08	152	253	0.000e+00	1.836e+04

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
152	254	1.103e+00	5.025e+09	152	255	0.000e+00	1.860e+05	152	256	1.118e-02	4.171e+07
152	257	0.000e+00	3.999e+04	152	258	0.000e+00	6.675e+03	152	259	0.000e+00	4.523e+04
152	264	1.125e-02	6.681e+07	152	266	0.000e+00	9.337e+04	152	270	0.000e+00	9.550e+05
152	282	5.155e-03	2.087e+07	153	194	3.809e-02	3.135e+06	153	195	1.214e+00	8.572e+07
153	198	3.021e-01	4.438e+07	153	212	0.000e+00	4.799e+04	153	220	1.438e+00	3.799e+09
153	229	0.000e+00	2.187e+04	153	231	0.000e+00	1.387e+04	153	232	0.000e+00	9.294e+04
153	236	0.000e+00	1.277e+04	153	237	0.000e+00	8.671e+04	153	244	1.120e-03	4.827e+06
153	245	1.193e-01	4.210e+08	153	246	3.796e+00	1.135e+10	153	249	7.259e-03	3.156e+07
153	254	4.983e-02	2.261e+08	153	255	0.000e+00	1.149e+04	153	256	1.184e+00	4.400e+09
153	257	0.000e+00	2.460e+05	153	259	0.000e+00	7.014e+03	153	260	0.000e+00	6.130e+04
153	270	0.000e+00	8.746e+04	153	271	0.000e+00	1.125e+06	154	196	5.072e-01	1.088e+08
154	208	4.497e-01	4.742e+08	154	213	0.000e+00	1.734e+04	154	214	5.584e-02	2.544e+08
154	223	6.239e-04	1.526e+07	154	225	2.572e-01	2.230e+09	154	226	0.000e+00	3.337e+04
154	233	0.000e+00	6.822e+04	154	238	0.000e+00	1.682e+04	154	250	1.186e+00	9.437e+09
154	261	0.000e+00	4.924e+05	154	262	7.615e-04	1.047e+07	154	274	3.598e-04	1.499e+07
154	280	0.000e+00	6.281e+05	154	283	4.535e-01	6.718e+09	155	189	1.872e-01	1.232e+07
155	190	3.698e-01	3.309e+07	155	210	0.000e+00	1.040e+04	155	214	9.642e-03	4.345e+07
155	216	1.170e-03	5.357e+06	155	218	1.411e-01	6.549e+08	155	219	9.361e-03	3.116e+07
155	224	9.385e-03	3.340e+07	155	227	0.000e+00	6.008e+03	155	230	0.000e+00	1.412e+04
155	235	0.000e+00	1.084e+04	155	243	1.491e+00	6.300e+09	155	244	1.433e+00	6.099e+09
155	247	4.942e-02	3.818e+08	155	248	4.672e-02	2.580e+08	155	249	2.651e-03	1.139e+07
155	250	3.683e-01	2.906e+09	155	251	0.000e+00	3.949e+03	155	252	9.029e-03	5.200e+07
155	253	0.000e+00	3.396e+04	155	254	6.604e-03	2.961e+07	155	255	0.000e+00	1.057e+04
155	258	0.000e+00	6.359e+03	155	263	2.968e-02	2.429e+08	155	264	7.487e-02	4.377e+08
155	266	0.000e+00	1.402e+05	155	272	4.597e-02	3.793e+08	155	275	6.469e-01	3.838e+09
156	183	6.797e-01	1.773e+07	156	207	1.164e-01	2.496e+08	156	213	2.813e-02	9.446e+07
156	214	0.000e+00	4.482e+03	156	224	0.000e+00	7.965e+03	156	225	0.000e+00	7.235e+03
156	228	1.068e-03	7.119e+06	156	233	1.135e+00	1.276e+10	156	234	1.137e-02	1.321e+08
156	235	5.265e-03	3.693e+07	156	238	1.687e-01	1.248e+09	156	239	5.665e-03	2.101e+08
156	241	2.705e-02	2.008e+08	156	250	0.000e+00	7.903e+04	156	275	0.000e+00	2.638e+04
156	280	1.556e-02	1.325e+08	156	281	2.559e-01	1.096e+10	156	283	0.000e+00	6.723e+04
157	226	1.474e-03	6.874e+06	157	230	1.317e-02	6.294e+07	157	242	5.534e-03	2.292e+07
157	244	0.000e+00	1.239e+04	157	251	3.564e-02	1.293e+08	157	253	1.527e+00	6.804e+09
157	258	2.347e-01	1.348e+09	157	260	4.505e-03	1.649e+07	157	261	8.099e-02	4.702e+08
157	265	2.847e-01	1.288e+09	157	266	1.582e-02	5.863e+07	157	268	4.119e-02	2.400e+08
157	269	1.570e-02	7.118e+07	158	190	2.891e-01	2.479e+07	158	216	1.082e-02	4.917e+07
158	217	5.258e-03	1.711e+07	158	218	5.754e-02	2.651e+08	158	219	4.135e-02	1.366e+08
158	220	1.941e-03	5.014e+06	158	221	1.256e-03	6.032e+06	158	227	0.000e+00	1.095e+04
158	231	0.000e+00	5.689e+03	158	235	0.000e+00	6.600e+03	158	243	2.487e-02	1.045e+08
158	244	1.425e+00	6.030e+09	158	247	2.693e-01	2.068e+09	158	248	8.775e-01	4.815e+09
158	249	6.615e-03	2.825e+07	158	250	3.602e-02	2.825e+08	158	252	8.477e-02	4.853e+08
158	253	0.000e+00	2.696e+04	158	254	2.706e-01	1.206e+09	158	255	0.000e+00	1.295e+04
158	258	0.000e+00	1.289e+04	158	259	0.000e+00	1.495e+04	158	263	4.260e-01	3.465e+09
158	264	2.240e-02	1.302e+08	158	266	0.000e+00	8.044e+04	158	272	6.697e-02	5.493e+08

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
158	275	3.927e-02	2.316e+08	159	214	1.036e-03	4.609e+06	159	215	7.151e-03	5.378e+07
159	216	3.918e-03	1.771e+07	159	218	1.685e-02	7.726e+07	159	219	1.896e-03	6.234e+06
159	227	0.000e+00	6.552e+03	159	247	1.120e+00	8.572e+09	159	248	4.102e-02	2.243e+08
159	250	1.601e-02	1.251e+08	159	252	3.714e-01	2.119e+09	159	253	0.000e+00	4.265e+04
159	258	0.000e+00	1.866e+04	159	262	3.836e-01	5.182e+09	159	263	2.608e-03	2.115e+07
159	264	2.750e-03	1.593e+07	159	272	1.117e-02	9.129e+07	159	273	2.114e-02	2.883e+08
159	275	3.797e-03	2.231e+07	159	283	2.518e-02	3.668e+08	160	231	1.143e-02	4.234e+07
160	245	0.000e+00	8.716e+03	160	251	7.439e-01	2.689e+09	160	253	9.141e-02	4.058e+08
160	255	1.266e+00	4.603e+09	160	257	3.479e-02	1.071e+08	160	259	2.099e-01	9.349e+08
160	260	1.448e-01	5.282e+08	160	265	1.521e-01	6.854e+08	160	269	1.098e-01	4.957e+08
160	270	1.591e-02	4.978e+07	160	276	8.979e-02	2.865e+08	161	194	5.563e-01	3.927e+07
161	217	2.055e-02	6.648e+07	161	219	9.570e-02	3.142e+08	161	220	5.656e-02	1.452e+08
161	228	0.000e+00	9.463e+03	161	231	0.000e+00	4.911e+03	161	232	0.000e+00	5.965e+03
161	236	0.000e+00	6.535e+03	161	243	5.812e-02	2.429e+08	161	244	1.217e-01	5.125e+08
161	245	2.425e+00	8.368e+09	161	248	3.675e-01	2.008e+09	161	249	9.617e-01	4.088e+09
161	252	4.262e-03	2.429e+07	161	254	1.588e-01	7.045e+08	161	255	0.000e+00	2.416e+04
161	256	2.870e-01	1.043e+09	161	257	0.000e+00	1.179e+04	161	259	0.000e+00	1.527e+04
161	260	0.000e+00	1.930e+04	161	264	3.311e-01	1.915e+09	161	266	0.000e+00	9.581e+03
161	270	0.000e+00	9.215e+04	161	275	4.135e-03	2.428e+07	161	276	0.000e+00	5.336e+03
161	282	3.573e-02	1.411e+08	162	226	3.625e-03	1.661e+07	162	236	1.420e-03	6.970e+06
162	242	1.361e-02	5.543e+07	162	251	7.900e-02	2.820e+08	162	253	1.355e-01	5.943e+08
162	255	8.443e-02	3.033e+08	162	258	5.683e-02	3.212e+08	162	259	9.509e-01	4.184e+09
162	260	6.796e-02	2.448e+08	162	261	3.017e-01	1.724e+09	162	265	1.021e+00	4.546e+09
162	268	4.994e-01	2.864e+09	162	269	1.012e-02	4.514e+07	162	277	1.986e-01	1.170e+09
163	226	3.697e-03	1.692e+07	163	235	2.379e-03	1.631e+07	163	253	1.729e-01	7.575e+08
163	258	1.554e+00	8.775e+09	163	259	1.518e-01	6.671e+08	163	261	4.674e-02	2.667e+08
163	267	6.117e-01	4.905e+09	163	269	1.153e-03	5.139e+06	163	277	7.708e-03	4.535e+07
163	278	7.185e-02	5.924e+08	163	280	6.941e-02	5.788e+08	164	190	3.712e-01	2.576e+07
164	216	4.208e-03	1.841e+07	164	217	1.884e-03	5.908e+06	164	218	5.215e-02	2.315e+08
164	219	2.523e-03	8.031e+06	164	224	2.710e-03	9.236e+06	164	230	0.000e+00	5.039e+03
164	243	2.505e-01	1.022e+09	164	244	1.747e+00	7.185e+09	164	247	4.508e-03	3.364e+07
164	248	5.700e-01	3.040e+09	164	249	1.574e-02	6.532e+07	164	250	1.403e-01	1.070e+09
164	252	1.294e-01	7.204e+08	164	254	1.986e-01	8.607e+08	164	255	0.000e+00	2.733e+04
164	259	0.000e+00	9.862e+03	164	263	1.282e-01	1.014e+09	164	264	9.265e-03	5.236e+07
164	266	0.000e+00	2.006e+04	164	272	1.490e-03	1.189e+07	164	275	2.829e-01	1.623e+09
165	194	5.413e-01	3.097e+07	165	217	1.066e-02	3.323e+07	165	219	7.810e-02	2.471e+08
165	220	1.179e-02	2.918e+07	165	229	0.000e+00	7.243e+03	165	231	0.000e+00	5.161e+03
165	244	1.020e-01	4.175e+08	165	245	2.347e+00	7.869e+09	165	248	1.546e-02	8.207e+07
165	249	1.116e+00	4.612e+09	165	252	1.383e-02	7.667e+07	165	254	2.324e-01	1.003e+09
165	256	3.083e-01	1.090e+09	165	257	0.000e+00	4.319e+04	165	260	0.000e+00	1.739e+04
165	264	2.211e-01	1.244e+09	165	270	0.000e+00	2.018e+04	165	275	4.139e-03	2.364e+07
166	220	0.000e+00	4.810e+03	166	232	3.412e-02	1.002e+08	166	246	0.000e+00	1.890e+04
166	251	6.581e-03	2.306e+07	166	255	1.446e-01	5.098e+08	166	257	2.462e+00	7.353e+09
166	260	1.194e-01	4.222e+08	166	270	6.295e-03	1.910e+07	166	271	3.360e-03	8.848e+06

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
167	226	3.516e-03	1.572e+07	167	230	5.460e-03	2.502e+07	167	236	1.575e-03	7.550e+06
167	242	1.185e-02	4.716e+07	167	244	0.000e+00	3.623e+03	167	251	2.014e-02	7.033e+07
167	253	6.081e-02	2.609e+08	167	255	1.782e-01	6.263e+08	167	258	1.357e-02	7.506e+07
167	259	9.516e-01	4.097e+09	167	260	1.069e-01	3.767e+08	167	261	2.463e-01	1.377e+09
167	265	1.016e+00	4.426e+09	167	268	2.526e-01	1.417e+09	167	269	7.617e-02	3.325e+08
167	277	2.424e-03	1.398e+07	168	231	1.162e-02	4.145e+07	168	232	1.711e-03	5.005e+06
168	237	2.760e-03	1.030e+07	168	245	0.000e+00	5.710e+03	168	246	0.000e+00	3.332e+03
168	251	9.613e-02	3.356e+08	168	253	2.925e-02	1.255e+08	168	255	2.597e-01	9.125e+08
168	257	3.886e-01	1.156e+09	168	259	4.920e-03	2.117e+07	168	260	1.959e+00	6.900e+09
168	265	1.185e-01	5.161e+08	168	266	4.164e-03	1.486e+07	168	269	3.286e-01	1.434e+09
168	276	1.268e-02	3.913e+07	169	195	1.115e+00	5.191e+07	169	220	9.576e-02	2.347e+08
169	232	0.000e+00	4.510e+03	169	244	2.131e-03	8.659e+06	169	245	1.730e-01	5.760e+08
169	246	4.872e+00	1.374e+10	169	249	3.233e-01	1.326e+09	169	254	2.644e-02	1.133e+08
169	256	7.193e-01	2.524e+09	169	257	0.000e+00	8.303e+03	169	271	0.000e+00	3.586e+04
170	231	1.693e-03	5.989e+06	170	242	6.989e-03	2.760e+07	170	251	1.064e+00	3.686e+09
170	253	2.481e-02	1.056e+08	170	255	5.648e-01	1.969e+09	170	257	4.493e-02	1.327e+08
170	259	5.285e-02	2.257e+08	170	260	4.602e-01	1.609e+09	170	265	4.580e-02	1.979e+08
170	266	4.317e-03	1.529e+07	170	269	3.007e-01	1.303e+09	170	270	4.002e-03	1.201e+07
170	276	2.180e-01	6.674e+08	170	282	0.000e+00	1.654e+04	171	203	5.352e-01	1.442e+08
171	204	3.172e-01	1.432e+08	171	205	1.062e-01	1.451e+08	171	221	1.216e-01	5.427e+08
171	222	7.565e-02	5.627e+08	171	223	2.537e-02	5.663e+08	171	227	0.000e+00	4.133e+04
171	228	0.000e+00	4.168e+04	171	229	0.000e+00	4.134e+04	171	262	5.659e-03	7.251e+07
171	263	1.460e-02	1.123e+08	171	272	9.613e-01	7.455e+09	171	273	5.718e-01	7.399e+09
171	274	1.908e-01	7.412e+09	171	277	0.000e+00	3.951e+05	171	278	0.000e+00	3.874e+05
171	279	0.000e+00	3.883e+05	171	280	0.000e+00	4.750e+03	172	216	1.345e-02	5.654e+07
172	218	1.538e-03	6.561e+06	172	219	8.219e-03	2.514e+07	172	220	2.215e-03	5.299e+06
172	221	6.392e-03	2.848e+07	172	240	0.000e+00	5.285e+03	172	243	5.001e-02	1.979e+08
172	247	5.334e-03	3.860e+07	172	248	2.882e-02	1.491e+08	172	249	7.125e-01	2.868e+09
172	250	1.982e-02	1.466e+08	172	254	5.413e-03	2.277e+07	172	255	0.000e+00	1.225e+04
172	259	0.000e+00	7.863e+03	172	263	1.184e-01	9.090e+08	172	264	1.188e+00	6.519e+09
172	272	1.152e+00	8.926e+09	172	275	8.391e-02	4.674e+08	173	215	1.200e-02	8.308e+07
173	218	6.543e-03	2.763e+07	173	219	2.404e-03	7.280e+06	173	221	1.261e-03	5.563e+06
173	222	3.604e-03	2.650e+07	173	239	0.000e+00	1.154e+04	173	247	6.656e-03	4.780e+07
173	248	5.027e-01	2.580e+09	173	250	3.998e-02	2.935e+08	173	253	0.000e+00	1.327e+04
173	258	0.000e+00	7.354e+03	173	262	1.172e-01	1.489e+09	173	263	6.098e-01	4.649e+09
173	264	1.601e-01	8.717e+08	173	272	3.212e-01	2.470e+09	173	273	6.345e-01	8.140e+09
173	275	3.118e-03	1.724e+07	173	283	2.227e-02	3.058e+08	174	215	1.589e-03	1.088e+07
174	222	1.501e-03	1.093e+07	174	223	1.932e-03	4.220e+07	174	247	2.668e-01	1.901e+09
174	250	1.040e-03	7.575e+06	174	262	3.887e-01	4.899e+09	174	263	1.435e-01	1.085e+09
174	272	3.045e-02	2.323e+08	174	273	3.138e-01	3.994e+09	174	274	3.336e-01	1.274e+10
175	229	3.327e-03	1.455e+07	175	242	1.480e-03	5.675e+06	175	253	7.178e-03	2.971e+07
175	255	5.599e-03	1.898e+07	175	258	3.880e-03	2.069e+07	175	259	7.588e-02	3.151e+08
175	260	4.182e-02	1.422e+08	175	261	2.188e-02	1.180e+08	175	265	7.147e-02	3.003e+08
175	268	3.496e-02	1.893e+08	175	269	2.299e+00	9.682e+09	175	277	1.516e+00	8.435e+09

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
176	213	2.535e-03	7.504e+06	176	226	8.378e-03	3.589e+07	176	228	1.469e-03	8.953e+06
176	253	9.438e-03	3.897e+07	176	258	7.936e-02	4.223e+08	176	259	2.977e-02	1.233e+08
176	261	8.031e-01	4.321e+09	176	265	4.443e-02	1.862e+08	176	267	6.441e-03	4.870e+07
176	268	9.400e-01	5.078e+09	176	269	5.766e-02	2.423e+08	176	277	8.269e-02	4.591e+08
176	278	7.026e-01	5.467e+09	176	280	4.013e-01	3.159e+09	177	227	2.249e-03	2.250e+07
177	267	1.208e+00	9.018e+09	177	268	1.551e-01	8.269e+08	177	277	6.370e-03	3.491e+07
177	278	1.771e-01	1.360e+09	177	279	7.926e-01	1.016e+10	178	213	3.467e-03	1.000e+07
178	226	1.173e-02	4.938e+07	178	228	1.315e-03	7.879e+06	178	261	1.001e+00	5.300e+09
178	267	8.205e-02	6.107e+08	178	268	7.208e-01	3.832e+09	178	269	7.284e-02	3.013e+08
178	277	9.627e-02	5.263e+08	178	278	3.903e-01	2.990e+09	178	280	8.730e-01	6.767e+09
179	217	2.105e-02	6.049e+07	179	220	1.742e-02	3.976e+07	179	224	6.909e-02	2.166e+08
179	226	0.000e+00	1.758e+04	179	242	0.000e+00	1.830e+04	179	243	1.411e+00	5.384e+09
179	244	3.462e-03	1.331e+07	179	245	9.218e-02	2.905e+08	179	248	2.393e-02	1.194e+08
179	249	9.633e-02	3.740e+08	179	251	0.000e+00	3.475e+04	179	254	1.243e-02	5.049e+07
179	256	7.676e-02	2.553e+08	179	257	0.000e+00	1.534e+04	179	260	0.000e+00	1.284e+04
179	269	0.000e+00	4.323e+03	179	275	2.034e-01	1.095e+09	179	276	0.000e+00	1.560e+05
179	282	4.333e-01	1.572e+09	180	197	7.542e-01	8.532e+07	180	210	0.000e+00	2.458e+04
180	211	0.000e+00	1.058e+04	180	214	1.806e-03	7.030e+06	180	215	4.712e-01	3.102e+09
180	216	1.306e-01	5.170e+08	180	217	6.386e-03	1.812e+07	180	218	2.562e-01	1.029e+09
180	219	3.230e-02	9.308e+07	180	222	8.018e-04	5.617e+06	180	227	0.000e+00	4.872e+04
180	228	0.000e+00	2.143e+04	180	230	0.000e+00	4.767e+04	180	231	0.000e+00	7.227e+03
180	235	0.000e+00	5.504e+03	180	239	0.000e+00	7.117e+04	180	240	0.000e+00	2.610e+04
180	247	4.238e-01	2.930e+09	180	248	2.860e-02	1.413e+08	180	250	8.924e-02	6.309e+08
180	252	2.937e+00	1.517e+10	180	253	0.000e+00	5.665e+05	180	258	0.000e+00	2.551e+05
180	261	0.000e+00	7.903e+03	180	262	7.383e-02	9.040e+08	180	263	5.047e-02	3.708e+08
180	264	7.113e-03	3.733e+07	180	265	0.000e+00	6.521e+03	180	267	0.000e+00	6.114e+04
180	268	0.000e+00	1.085e+04	180	272	8.847e-03	6.557e+07	180	273	1.846e-02	2.283e+08
180	279	0.000e+00	7.115e+03	180	283	5.009e-02	6.637e+08	181	199	1.079e+00	9.628e+07
181	210	0.000e+00	1.255e+04	181	211	0.000e+00	1.944e+04	181	212	0.000e+00	8.540e+03
181	216	6.962e-01	2.751e+09	181	217	1.550e-01	4.388e+08	181	218	7.785e-02	3.123e+08
181	219	3.495e-01	1.005e+09	181	220	3.814e-02	8.582e+07	181	221	1.305e-03	5.474e+06
181	227	0.000e+00	2.561e+04	181	228	0.000e+00	3.861e+04	181	229	0.000e+00	1.692e+04
181	230	0.000e+00	1.389e+04	181	231	0.000e+00	4.582e+04	181	232	0.000e+00	6.506e+03
181	240	0.000e+00	5.334e+04	181	241	0.000e+00	1.568e+04	181	247	5.018e-02	3.464e+08
181	248	5.024e-01	2.479e+09	181	249	3.955e-02	1.519e+08	181	251	0.000e+00	1.291e+04
181	252	2.757e-01	1.423e+09	181	253	0.000e+00	1.893e+04	181	254	4.247e+00	1.706e+10
181	255	0.000e+00	5.885e+05	181	258	0.000e+00	6.820e+04	181	259	0.000e+00	3.106e+05
181	263	1.644e-01	1.206e+09	181	264	4.301e-02	2.254e+08	181	267	0.000e+00	2.696e+04
181	268	0.000e+00	6.143e+04	181	269	0.000e+00	8.936e+03	181	272	1.600e-02	1.184e+08
181	278	0.000e+00	6.340e+03	182	198	1.383e+00	9.930e+07	182	211	0.000e+00	8.003e+03
182	212	0.000e+00	2.935e+04	182	217	9.891e-01	2.793e+09	182	219	1.016e-01	2.915e+08
182	220	5.654e-01	1.269e+09	182	228	0.000e+00	1.588e+04	182	229	0.000e+00	5.596e+04
182	231	0.000e+00	1.119e+04	182	232	0.000e+00	5.746e+04	182	237	0.000e+00	7.155e+03
182	238	0.000e+00	4.926e+03	182	241	0.000e+00	5.713e+04	182	243	4.372e-02	1.646e+08

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
182	248	4.393e-02	2.163e+08	182	249	6.345e-01	2.432e+09	182	252	4.396e-03	2.264e+07
182	254	2.878e-01	1.154e+09	182	255	0.000e+00	6.768e+03	182	256	5.492e+00	1.803e+10
182	257	0.000e+00	6.213e+05	182	259	0.000e+00	5.265e+04	182	260	0.000e+00	3.577e+05
182	264	2.828e-01	1.479e+09	182	265	0.000e+00	1.815e+04	182	268	0.000e+00	2.033e+04
182	269	0.000e+00	6.630e+04	182	275	7.642e-03	4.061e+07	182	276	0.000e+00	2.932e+03
182	277	0.000e+00	8.740e+03	182	282	5.602e-03	2.007e+07	183	208	3.595e-02	2.304e+07
183	214	2.640e-02	1.013e+08	183	215	2.888e-02	1.875e+08	183	216	4.975e-03	1.942e+07
183	218	8.979e-03	3.559e+07	183	219	2.152e-03	6.118e+06	183	233	0.000e+00	1.454e+04
183	239	0.000e+00	6.766e+03	183	247	3.544e-03	2.424e+07	183	248	1.760e-02	8.607e+07
183	250	1.283e+00	8.978e+09	183	252	2.510e-01	1.283e+09	183	253	0.000e+00	3.141e+04
183	258	0.000e+00	1.772e+04	183	261	0.000e+00	2.700e+04	183	262	4.441e-02	5.382e+08
183	263	4.122e-03	2.998e+07	183	265	0.000e+00	2.077e+04	183	269	0.000e+00	4.135e+03
183	272	1.305e-02	9.572e+07	183	273	1.416e-02	1.733e+08	183	275	9.997e-02	5.275e+08
183	280	0.000e+00	6.036e+03	183	281	0.000e+00	7.345e+03	183	283	8.420e-01	1.105e+10
184	202	2.255e-01	1.777e+07	184	205	5.250e-02	2.653e+07	184	210	0.000e+00	8.700e+03
184	215	2.166e-02	1.229e+08	184	216	8.587e-02	2.930e+08	184	221	1.864e-01	6.780e+08
184	222	1.194e-01	7.241e+08	184	223	1.547e-01	2.815e+09	184	227	0.000e+00	2.141e+04
184	229	0.000e+00	9.452e+03	184	235	0.000e+00	1.806e+04	184	236	0.000e+00	2.663e+04
184	240	0.000e+00	1.805e+04	184	241	0.000e+00	3.056e+04	184	262	3.383e-01	3.718e+09
184	263	1.291e+00	8.514e+09	184	267	0.000e+00	1.541e+05	184	268	0.000e+00	2.373e+05
184	272	1.792e-01	1.193e+09	184	273	2.423e-01	2.691e+09	184	274	2.524e-01	8.415e+09
184	277	0.000e+00	1.231e+05	184	278	0.000e+00	4.130e+04	184	279	0.000e+00	3.158e+05
185	215	3.868e-02	2.194e+08	185	222	1.512e-01	9.167e+08	185	228	0.000e+00	9.547e+03
185	235	0.000e+00	1.855e+04	185	241	0.000e+00	1.355e+04	185	262	5.815e-01	6.390e+09
185	267	0.000e+00	1.686e+05	185	273	1.862e-01	2.067e+09	185	278	0.000e+00	1.263e+05
186	201	3.940e-01	2.190e+07	186	203	1.883e-01	1.849e+07	186	211	0.000e+00	6.778e+03
186	212	0.000e+00	7.595e+03	186	214	2.069e-02	6.924e+07	186	216	1.329e-02	4.531e+07
186	217	1.331e-01	3.253e+08	186	219	2.286e-03	5.682e+06	186	221	5.632e-01	2.047e+09
186	222	1.921e-01	1.164e+09	186	225	1.311e-02	8.533e+07	186	227	0.000e+00	7.692e+03
186	228	0.000e+00	1.612e+04	186	229	0.000e+00	1.838e+04	186	236	0.000e+00	1.194e+04
186	237	0.000e+00	3.803e+04	186	239	0.000e+00	7.050e+04	186	240	0.000e+00	5.305e+04
186	241	0.000e+00	2.416e+04	186	250	3.220e-02	2.038e+08	186	261	0.000e+00	1.783e+04
186	262	1.202e-02	1.320e+08	186	263	2.501e-01	1.648e+09	186	264	2.135e+00	1.005e+10
186	265	0.000e+00	1.089e+05	186	267	0.000e+00	1.706e+04	186	268	0.000e+00	9.550e+04
186	269	0.000e+00	2.282e+05	186	272	1.025e+00	6.817e+09	186	273	3.129e-01	3.472e+09
186	275	5.942e-02	2.844e+08	186	277	0.000e+00	2.732e+05	186	278	0.000e+00	2.417e+05
186	279	0.000e+00	1.003e+05	186	281	0.000e+00	1.097e+04	186	283	9.295e-03	1.110e+08
187	206	6.394e-01	5.313e+07	187	208	3.549e-02	1.369e+07	187	213	0.000e+00	2.060e+04
187	214	2.706e-01	8.962e+08	187	216	2.159e-03	7.283e+06	187	217	3.590e-03	8.683e+06
187	218	3.584e-03	1.229e+07	187	221	2.911e-02	1.048e+08	187	222	2.529e-03	1.517e+07
187	224	7.050e-02	1.875e+08	187	225	4.700e-01	3.029e+09	187	226	0.000e+00	2.135e+04
187	233	0.000e+00	8.018e+04	187	242	0.000e+00	7.681e+04	187	247	2.802e-03	1.719e+07
187	250	6.766e-01	4.249e+09	187	261	0.000e+00	3.147e+05	187	263	8.188e-03	5.357e+07
187	264	3.688e-02	1.724e+08	187	265	0.000e+00	2.463e+05	187	268	0.000e+00	6.104e+03

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
187	269	0.000e+00	1.130e+05	187	272	4.375e-02	2.889e+08	187	273	1.336e-02	1.471e+08
187	275	2.811e+00	1.336e+10	187	277	0.000e+00	1.443e+04	187	278	0.000e+00	4.736e+03
187	280	0.000e+00	1.077e+05	187	281	0.000e+00	2.892e+05	187	283	2.461e-01	2.917e+09
188	209	2.400e+00	2.697e+08	188	213	0.000e+00	3.208e+04	188	224	1.686e+00	4.365e+09
188	226	0.000e+00	7.095e+04	188	238	0.000e+00	3.741e+04	188	242	0.000e+00	1.136e+05
188	243	3.941e-01	1.292e+09	188	244	5.443e-03	1.800e+07	188	251	0.000e+00	1.541e+05
188	255	0.000e+00	3.825e+03	188	265	0.000e+00	1.328e+04	188	275	1.442e-01	6.718e+08
188	276	0.000e+00	6.909e+05	188	282	7.192e+00	2.268e+10	189	214	0.000e+00	1.028e+04
189	224	0.000e+00	7.907e+03	189	226	1.432e-01	5.037e+08	189	243	0.000e+00	2.167e+04
189	250	0.000e+00	1.026e+04	189	251	1.069e+01	3.012e+10	189	253	1.113e-02	3.852e+07
189	255	2.447e-01	6.941e+08	189	258	7.604e-03	3.394e+07	189	259	2.863e-03	9.949e+06
189	260	2.189e-02	6.227e+07	189	261	3.018e-01	1.364e+09	189	265	6.878e-01	2.421e+09
189	266	1.590e-02	4.587e+07	189	269	9.010e-02	3.180e+08	189	275	0.000e+00	2.955e+04
189	282	0.000e+00	2.002e+04	190	218	0.000e+00	1.193e+04	190	229	7.968e-03	2.715e+07
190	230	1.112e-01	3.821e+08	190	231	5.777e-03	1.546e+07	190	244	0.000e+00	3.410e+04
190	245	0.000e+00	4.236e+03	190	251	5.793e-03	1.558e+07	190	252	0.000e+00	1.468e+04
190	253	2.384e-01	7.881e+08	190	258	1.342e-01	5.718e+08	190	259	2.309e-02	7.661e+07
190	260	6.448e-01	1.752e+09	190	261	8.784e-03	3.790e+07	190	265	3.394e-03	1.141e+07
190	266	1.153e+01	3.177e+10	190	268	1.070e-03	4.635e+06	190	269	7.654e-02	2.580e+08
190	277	2.739e-02	1.224e+08	191	215	0.000e+00	4.979e+03	191	223	0.000e+00	9.061e+03
191	227	6.865e-02	5.437e+08	191	228	1.160e-02	5.516e+07	191	230	4.198e-03	1.440e+07
191	235	3.672e-03	1.856e+07	191	244	0.000e+00	5.724e+03	191	247	0.000e+00	7.830e+03
191	252	0.000e+00	1.402e+04	191	258	5.624e+00	2.394e+10	191	261	1.479e-02	6.374e+07
191	262	0.000e+00	2.755e+04	191	263	0.000e+00	1.096e+04	191	267	5.605e-01	3.396e+09
191	268	1.801e-02	7.796e+07	191	274	0.000e+00	1.509e+04	191	278	3.937e-02	2.463e+08
191	279	2.169e-01	2.264e+09	192	221	0.000e+00	6.803e+03	192	229	1.369e-01	4.654e+08
192	230	6.793e-03	2.329e+07	192	232	5.999e-03	1.314e+07	192	237	4.908e-03	1.381e+07
192	244	0.000e+00	2.956e+03	192	246	0.000e+00	6.800e+03	192	249	0.000e+00	8.961e+03
192	251	8.295e-02	2.226e+08	192	253	3.043e-03	1.004e+07	192	255	9.462e-01	2.557e+09
192	256	0.000e+00	1.453e+04	192	258	2.435e-02	1.036e+08	192	259	2.926e-01	9.689e+08
192	260	7.978e+00	2.163e+10	192	261	1.378e-03	5.936e+06	192	264	0.000e+00	2.855e+04
192	265	2.117e-01	7.104e+08	192	266	7.456e-01	2.051e+09	192	268	6.970e-02	3.015e+08
192	269	9.687e-01	3.259e+09	192	272	0.000e+00	1.378e+04	192	277	4.181e-01	1.865e+09
193	222	0.000e+00	6.247e+03	193	228	1.013e-01	4.806e+08	193	229	1.151e-02	3.909e+07
193	231	5.119e-03	1.365e+07	193	236	4.214e-03	1.519e+07	193	245	0.000e+00	5.999e+03
193	248	0.000e+00	6.786e+03	193	253	5.886e-01	1.939e+09	193	254	0.000e+00	1.243e+04
193	258	3.622e-01	1.539e+09	193	259	6.815e+00	2.254e+10	193	261	1.168e-02	5.024e+07
193	262	0.000e+00	1.037e+04	193	263	0.000e+00	2.134e+04	193	265	3.624e-03	1.215e+07
193	267	6.319e-02	3.821e+08	193	268	8.563e-01	3.699e+09	193	269	1.343e-02	4.514e+07
193	273	0.000e+00	1.269e+04	193	277	2.979e-02	1.327e+08	193	278	3.198e-01	1.997e+09
193	280	3.061e-03	1.936e+07	194	219	0.000e+00	1.163e+04	194	231	1.434e-01	3.811e+08
194	232	5.263e-03	1.147e+07	194	244	0.000e+00	4.370e+03	194	245	0.000e+00	3.322e+04
194	246	0.000e+00	2.953e+03	194	251	1.747e-02	4.669e+07	194	253	1.334e-03	4.381e+06
194	254	0.000e+00	1.314e+04	194	255	1.994e-01	5.366e+08	194	257	8.776e-02	2.001e+08

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
194	259	2.110e-01	6.956e+08	194	265	2.089e-03	6.980e+06	194	266	4.426e-01	1.212e+09
194	270	1.455e+01	3.377e+10	194	276	3.725e-02	8.849e+07	195	220	0.000e+00	1.171e+04
195	232	1.720e-01	3.739e+08	195	245	0.000e+00	3.574e+03	195	246	0.000e+00	3.610e+04
195	251	1.839e-03	4.902e+06	195	255	5.895e-03	1.583e+07	195	256	0.000e+00	1.469e+04
195	257	2.155e-01	4.900e+08	195	260	2.759e-01	7.429e+08	195	266	3.561e-03	9.731e+06
195	270	4.454e-01	1.031e+09	195	271	1.741e+01	3.498e+10	196	225	0.000e+00	1.423e+04
196	226	4.907e-03	1.563e+07	196	233	7.948e-02	6.110e+08	196	243	0.000e+00	7.279e+03
196	258	1.437e-02	5.874e+07	196	261	5.441e+00	2.253e+10	196	268	5.680e-03	2.362e+07
196	275	0.000e+00	2.388e+04	196	277	2.777e-03	1.192e+07	196	278	7.535e-03	4.531e+07
196	279	7.314e-04	7.339e+06	196	280	1.142e+00	6.958e+09	196	283	0.000e+00	5.447e+04
197	215	0.000e+00	1.103e+04	197	218	0.000e+00	5.137e+03	197	230	4.812e-02	1.439e+08
197	231	3.408e-03	7.940e+06	197	235	2.135e-01	9.440e+08	197	236	2.015e-02	6.372e+07
197	244	0.000e+00	1.634e+04	197	247	0.000e+00	2.733e+04	197	252	0.000e+00	1.935e+04
197	253	8.472e+00	2.474e+10	197	258	8.240e-01	3.103e+09	197	259	3.815e-01	1.119e+09
197	261	2.053e-03	7.834e+06	197	262	0.000e+00	1.064e+04	197	265	3.282e-03	9.759e+06
197	267	1.724e-01	9.252e+08	197	268	8.530e-03	3.269e+07	197	269	1.569e-02	4.678e+07
197	277	4.286e-03	1.697e+07	198	217	0.000e+00	8.997e+03	198	220	0.000e+00	6.489e+03
198	231	3.642e-03	8.454e+06	198	232	7.952e-02	1.514e+08	198	237	3.655e-01	8.971e+08
198	246	0.000e+00	1.875e+04	198	249	0.000e+00	2.644e+04	198	251	1.735e-03	4.105e+06
198	255	9.632e-02	2.296e+08	198	256	0.000e+00	2.135e+04	198	257	1.340e+01	2.707e+10
198	259	4.239e-02	1.238e+08	198	260	1.615e+00	3.864e+09	198	265	5.461e-02	1.618e+08
198	266	1.981e-03	4.811e+06	198	269	2.690e-01	7.992e+08	198	270	4.674e-02	9.622e+07
198	276	2.229e-03	4.702e+06	199	216	0.000e+00	8.520e+03	199	219	0.000e+00	4.473e+03
199	230	3.391e-03	1.010e+07	199	231	6.042e-02	1.402e+08	199	232	3.399e-03	6.468e+06
199	236	2.802e-01	8.822e+08	199	237	1.989e-02	4.878e+07	199	244	0.000e+00	2.707e+03
199	245	0.000e+00	1.597e+04	199	248	0.000e+00	2.196e+04	199	251	1.843e-01	4.357e+08
199	253	1.467e-01	4.267e+08	199	254	0.000e+00	1.689e+04	199	255	1.006e+01	2.398e+10
199	258	4.127e-02	1.548e+08	199	259	1.303e+00	3.805e+09	199	260	6.548e-01	1.566e+09
199	261	1.760e-03	6.688e+06	199	265	4.412e-03	1.306e+07	199	266	4.282e-02	1.040e+08
199	268	2.450e-01	9.352e+08	199	269	5.618e-03	1.669e+07	199	277	1.220e-03	4.812e+06
200	222	0.000e+00	6.286e+03	200	227	3.095e-02	2.087e+08	200	228	8.367e-03	3.389e+07
200	235	7.209e-03	3.118e+07	200	239	2.878e-02	6.681e+08	200	240	1.931e-02	1.495e+08
200	241	1.019e-03	4.738e+06	200	247	0.000e+00	1.652e+04	200	267	3.455e+00	1.817e+10
200	273	0.000e+00	1.947e+04	200	278	2.460e-01	1.339e+09	200	279	4.183e-01	3.798e+09
200	280	4.657e-03	2.570e+07	201	221	0.000e+00	7.625e+03	201	222	0.000e+00	6.135e+03
201	228	1.055e-02	4.269e+07	201	229	8.232e-02	2.382e+08	201	237	1.505e-02	3.622e+07
201	238	8.399e-03	3.881e+07	201	241	1.049e-01	4.872e+08	201	248	0.000e+00	9.025e+03
201	249	0.000e+00	2.294e+04	201	253	2.412e-02	6.894e+07	201	259	2.632e-02	7.552e+07
201	261	3.642e-03	1.360e+07	201	265	1.156e+00	3.365e+09	201	267	1.951e-02	1.025e+08
201	268	5.616e-01	2.107e+09	201	269	6.095e+00	1.779e+10	201	272	0.000e+00	2.983e+04
201	273	0.000e+00	2.459e+04	201	277	1.540e+00	5.971e+09	201	278	1.909e-01	1.038e+09
201	280	8.953e-04	4.935e+06	202	223	0.000e+00	1.335e+04	202	227	9.602e-03	6.462e+07
202	228	4.714e-02	1.905e+08	202	229	9.387e-03	2.714e+07	202	236	1.066e-02	3.291e+07
202	238	1.379e-03	6.366e+06	202	240	6.209e-02	4.796e+08	202	241	1.837e-02	8.524e+07

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
202	247	0.000e+00	1.093e+04	202	248	0.000e+00	1.417e+04	202	258	1.561e-02	5.750e+07
202	261	1.497e-03	5.587e+06	202	267	5.972e-01	3.135e+09	202	268	5.082e+00	1.905e+10
202	272	0.000e+00	1.722e+04	202	274	0.000e+00	5.033e+04	202	277	1.628e-01	6.311e+08
202	278	8.281e-01	4.498e+09	202	279	1.775e-01	1.608e+09	202	280	3.100e-03	1.707e+07
203	222	0.000e+00	6.327e+03	203	223	0.000e+00	8.228e+03	203	228	2.126e-03	8.308e+06
203	229	1.378e-02	3.853e+07	203	234	8.346e-02	5.760e+08	203	240	2.877e-03	2.154e+07
203	241	1.132e-02	5.089e+07	203	249	0.000e+00	7.858e+03	203	261	3.033e-03	1.099e+07
203	263	0.000e+00	1.541e+04	203	264	0.000e+00	1.473e+04	203	268	1.373e-03	4.999e+06
203	273	0.000e+00	2.023e+04	203	274	0.000e+00	3.138e+04	203	277	5.736e+00	2.160e+10
203	278	1.063e+00	5.611e+09	203	279	7.501e-02	6.605e+08	203	280	8.839e-03	4.730e+07
204	227	1.274e-03	8.278e+06	204	228	8.197e-03	3.199e+07	204	234	4.863e-02	3.353e+08
204	239	1.756e-03	3.939e+07	204	240	3.824e-03	2.859e+07	204	241	3.752e-03	1.685e+07
204	262	0.000e+00	1.352e+04	204	267	7.859e-03	4.001e+07	204	272	0.000e+00	1.294e+04
204	273	0.000e+00	1.180e+04	204	278	2.958e+00	1.559e+10	204	279	1.149e+00	1.011e+10
204	280	1.638e-02	8.756e+07	205	227	3.023e-03	1.960e+07	205	234	1.617e-02	1.112e+08
205	240	3.233e-03	2.412e+07	205	279	1.376e+00	1.208e+10	206	214	0.000e+00	6.795e+03
206	225	0.000e+00	9.936e+03	206	226	7.303e-02	1.922e+08	206	238	2.189e-01	9.454e+08
206	241	1.679e-02	7.286e+07	206	242	1.802e-01	4.391e+08	206	243	0.000e+00	1.883e+04
206	250	0.000e+00	3.935e+04	206	253	3.681e-03	9.867e+06	206	258	8.298e-03	2.869e+07
206	259	1.837e-02	4.944e+07	206	261	1.106e+00	3.876e+09	206	265	6.864e+00	1.875e+10
206	269	1.314e+00	3.600e+09	206	277	1.281e-03	4.668e+06	206	278	1.326e-03	6.773e+06
206	280	2.917e-01	1.511e+09	206	283	0.000e+00	1.487e+04	207	225	1.503e-01	6.512e+08
207	238	0.000e+00	4.789e+04	207	280	0.000e+00	1.694e+05	207	283	9.625e-01	8.577e+09
208	225	0.000e+00	9.099e+03	208	233	6.225e-02	3.419e+08	208	238	6.617e-02	2.486e+08
208	241	5.042e-03	1.904e+07	208	250	0.000e+00	2.536e+04	208	267	1.378e-03	5.964e+06
208	278	2.486e-02	1.117e+08	208	280	4.355e+00	1.987e+10	208	281	3.501e-02	8.053e+08
208	283	0.000e+00	2.591e+04	209	224	0.000e+00	1.481e+04	209	242	7.646e-01	1.554e+09
209	243	0.000e+00	1.753e+04	209	251	5.812e-01	1.065e+09	209	255	1.222e-02	2.258e+07
209	257	3.540e-03	5.544e+06	209	260	2.177e-03	4.039e+06	209	265	9.231e-02	2.125e+08
209	269	1.915e-02	4.425e+07	209	270	3.822e-02	6.117e+07	209	276	1.650e+01	2.715e+10
209	282	0.000e+00	5.589e+04	210	215	7.382e-01	1.406e+08	210	216	1.406e-01	1.627e+07
210	218	1.523e+00	1.923e+08	210	222	3.045e-01	8.146e+07	210	223	3.633e-01	2.921e+08
210	240	0.000e+00	4.603e+03	211	215	2.805e-01	5.300e+07	211	216	1.227e+00	1.408e+08
211	217	1.078e-01	9.011e+06	211	218	1.393e-01	1.745e+07	211	219	2.278e+00	2.085e+08
211	221	3.192e-01	5.085e+07	211	222	7.815e-01	2.076e+08	211	231	0.000e+00	4.451e+03
211	239	0.000e+00	1.045e+04	212	216	3.208e-01	3.629e+07	212	217	2.281e+00	1.879e+08
212	219	9.726e-02	8.776e+06	212	220	3.098e+00	2.245e+08	212	221	1.448e+00	2.278e+08
212	232	0.000e+00	5.299e+03	212	237	0.000e+00	6.673e+03	212	240	0.000e+00	5.001e+03
212	241	0.000e+00	5.468e+03	213	214	1.529e+00	1.268e+08	213	224	2.512e+00	2.833e+08
213	225	1.047e+00	3.298e+08	213	238	0.000e+00	8.502e+03	213	242	0.000e+00	8.519e+03
213	250	1.356e-02	1.287e+07	213	275	5.069e-02	3.969e+07	213	281	0.000e+00	1.775e+04
214	226	2.490e+00	3.455e+08	214	230	2.795e-02	4.441e+06	214	233	3.935e-01	1.490e+08
214	235	2.218e-02	6.186e+06	214	238	1.635e+00	5.874e+08	214	241	7.542e-02	2.755e+07
214	280	2.119e-02	1.348e+07	215	227	6.666e-01	2.202e+08	215	228	2.031e-01	4.041e+07

Table III. Ca IX Oscillator Strengths and Radiative Decay Rates for transitions involving levels higher than 4.

Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)	Low. Lev. i	Upp. Lev. j	Osc. Str. gf	Rad. Rate (1/s)
215	235	1.725e+00	4.547e+08	215	239	2.021e-01	3.498e+08	215	240	1.195e-01	6.900e+07
216	227	2.419e-01	7.913e+07	216	228	9.733e-01	1.918e+08	216	229	1.885e-01	2.674e+07
216	230	3.592e-02	5.304e+06	216	235	4.568e-01	1.194e+08	216	236	2.416e+00	4.529e+08
216	240	4.552e-01	2.609e+08	216	241	9.374e-02	3.236e+07	217	228	2.622e-01	5.092e+07
217	229	1.647e+00	2.302e+08	217	231	6.807e-02	7.761e+06	217	235	2.135e-02	5.508e+06
217	236	5.285e-01	9.781e+07	217	237	3.498e+00	5.071e+08	217	238	6.549e-02	2.197e+07
217	241	6.927e-01	2.365e+08	218	227	7.874e-02	2.404e+07	218	228	6.864e-02	1.263e+07
218	230	3.426e+00	4.731e+08	218	235	7.756e-01	1.909e+08	218	236	2.340e-01	4.133e+07
218	238	2.664e-02	8.578e+06	219	228	1.211e-01	2.186e+07	219	229	1.048e-01	1.362e+07
219	230	2.892e-01	3.921e+07	219	231	4.492e+00	4.770e+08	219	235	1.067e-01	2.584e+07
219	236	1.039e+00	1.804e+08	219	237	3.146e-01	4.283e+07	220	229	2.432e-01	3.076e+07
220	231	2.828e-01	2.924e+07	220	232	5.893e+00	5.047e+08	220	236	1.204e-01	2.044e+07
220	237	1.747e+00	2.324e+08	221	228	1.757e-01	2.585e+07	221	229	1.269e+00	1.346e+08
221	234	8.149e-01	2.650e+08	221	238	9.574e-02	2.610e+07	221	240	6.032e-01	2.783e+08
221	241	1.815e+00	5.045e+08	222	227	1.951e-01	4.760e+07	222	228	6.856e-01	1.009e+08
222	234	5.128e-01	1.667e+08	222	238	6.567e-02	1.790e+07	222	239	4.763e-01	6.585e+08
222	240	3.736e-01	1.723e+08	222	241	5.490e-01	1.526e+08	222	281	1.610e-03	4.275e+06
223	227	2.904e-01	7.073e+07	223	234	1.744e-01	5.661e+07	223	240	4.813e-01	2.217e+08
224	226	8.995e-01	7.052e+07	224	238	3.231e-01	7.755e+07	224	241	3.428e-02	8.399e+06
224	242	5.341e+00	7.599e+08	224	265	1.211e-01	2.663e+07	224	269	2.217e-02	4.926e+06
224	280	9.764e-03	4.622e+06	225	233	8.382e-01	1.521e+08	225	238	1.036e+00	2.123e+08
225	241	1.004e-01	2.104e+07	225	280	1.489e-02	6.306e+06	225	281	8.209e-01	1.784e+09
226	243	1.857e+00	3.896e+07	226	275	7.893e-01	5.714e+07	227	247	7.410e-01	2.866e+07
227	262	3.140e-01	4.037e+07	227	274	3.285e-02	1.401e+07	228	248	1.105e+00	3.051e+07
228	262	8.370e-02	1.069e+07	228	263	4.953e-01	3.802e+07	228	273	9.066e-02	1.273e+07
229	249	1.578e+00	3.362e+07	229	264	8.422e-01	4.565e+07	229	272	1.685e-01	1.390e+07
230	244	1.906e+00	3.206e+07	230	252	3.120e-01	1.339e+07	231	245	2.368e+00	3.269e+07
231	254	3.935e-01	1.313e+07	232	246	2.897e+00	3.352e+07	232	256	5.185e-01	1.399e+07
233	250	7.603e-01	3.337e+07	233	283	6.588e-01	1.505e+08	234	272	7.111e-01	3.785e+07
234	273	4.195e-01	3.767e+07	234	274	1.395e-01	3.785e+07	235	252	1.213e+00	3.081e+07
236	254	1.594e+00	3.163e+07	237	256	2.084e+00	3.365e+07	238	275	8.087e-01	1.474e+07

Table IV. Ca IX Fractional Level Populations

log(Den.)	8	9	10	11	12	13	14
Key				Population			
1	9.938-01	9.853-01	9.446-01	9.073-01	9.003-01	8.994-01	8.982-01
2	5.197-03	5.977-03	9.704-03	1.311-02	1.375-02	1.384-02	1.397-02
3	4.039-10	4.134-09	4.584-08	4.996-07	5.074-06	5.081-05	5.071-04
4	9.568-04	8.703-03	4.572-02	7.956-02	8.592-02	8.667-02	8.729-02
5	3.648-12	3.617-11	3.470-10	3.335-09	3.310-08	3.307-07	3.302-06
6	1.252-12	1.247-11	1.221-10	1.198-09	1.194-08	1.193-07	1.192-06
7	1.934-16	2.258-15	3.806-14	5.223-13	5.516-12	5.817-11	8.531-10
8	9.727-15	1.450-13	3.733-12	5.820-11	6.213-10	6.262-09	6.333-08
9	7.085-15	1.682-13	6.331-12	1.058-10	1.138-09	1.148-08	1.159-07
10	1.095-15	1.099-14	1.120-13	1.139-12	1.143-11	1.143-10	1.144-09
11	1.034-14	1.112-13	1.483-12	1.821-11	1.885-10	1.894-09	1.916-08
12	1.008-14	1.119-13	1.649-12	2.134-11	2.226-10	2.239-09	2.278-08
13	1.462-14	2.061-13	4.923-12	7.539-11	8.032-10	8.089-09	8.139-08
14	6.208-14	6.157-13	5.914-12	5.691-11	5.649-10	5.644-09	5.637-08
15	2.531-15	2.872-14	4.504-13	5.996-12	6.277-11	6.318-10	6.426-09
16	1.322-15	1.928-14	4.826-13	7.475-12	7.974-11	8.045-10	8.216-09
17	1.668-15	3.940-14	1.480-12	2.472-11	2.659-10	2.681-09	2.699-08
18	4.461-16	4.660-15	5.607-14	6.474-13	6.637-12	6.657-11	6.687-10
19	2.621-16	2.937-15	4.447-14	5.828-13	6.088-12	6.126-11	6.227-10
20	6.772-17	7.984-16	1.378-14	1.907-13	2.007-12	2.023-11	2.079-10
21	3.836-17	6.065-16	1.671-14	2.645-13	2.828-12	2.850-11	2.868-10
22	5.772-17	1.011-15	3.081-14	4.974-13	5.330-12	5.373-11	5.417-10
23	9.546-17	1.708-15	5.309-14	8.600-13	9.219-12	9.293-11	9.360-10
24	5.728-17	1.352-15	5.077-14	8.481-13	9.122-12	9.200-11	9.293-10
25	1.159-15	1.159-14	1.161-13	1.162-12	1.162-11	1.162-10	1.162-09
26	4.519-16	4.512-15	4.476-14	4.443-13	4.436-12	4.436-11	4.434-10
27	1.836-16	1.970-15	2.610-14	3.195-13	3.305-12	3.319-11	3.337-10
28	9.603-15	9.521-14	9.129-13	8.772-12	8.704-11	8.696-10	8.684-09
29	2.685-16	2.918-15	4.031-14	5.049-13	5.241-12	5.265-11	5.302-10
30	6.635-16	6.678-15	6.879-14	7.063-13	7.098-12	7.110-11	7.192-10
31	7.375-19	8.333-18	1.291-16	1.710-15	1.789-14	1.799-13	1.820-12
32	1.013-18	1.229-17	2.263-16	3.209-15	3.386-14	3.408-13	3.436-12
33	7.307-16	9.366-15	1.921-13	2.821-12	2.990-11	3.010-10	3.028-09
34	1.093-18	1.373-17	2.706-16	3.926-15	4.155-14	4.183-13	4.219-12
35	1.168-15	1.159-14	1.119-13	1.082-12	1.075-11	1.074-10	1.073-09
36	9.097-18	9.682-17	1.248-15	1.503-14	1.551-13	1.557-12	1.566-11
37	1.250-16	1.243-15	1.210-14	1.180-13	1.175-12	1.174-11	1.173-10
38	9.206-19	1.076-17	1.816-16	2.493-15	2.621-14	2.636-13	2.657-12
39	2.347-19	2.357-18	2.406-17	2.451-16	2.461-15	2.468-14	2.533-13
40	1.819-18	2.168-17	3.839-16	5.366-15	5.653-14	5.687-13	5.723-12
41	1.284-17	1.274-16	1.226-15	1.182-14	1.173-13	1.172-12	1.171-11
42	1.064-16	1.081-15	1.164-14	1.240-13	1.254-12	1.256-11	1.260-10
43	1.670-16	1.694-15	1.804-14	1.905-13	1.924-12	1.926-11	1.932-10
44	2.284-16	2.368-15	2.773-14	3.144-13	3.213-12	3.221-11	3.229-10
45	1.992-15	1.978-14	1.909-13	1.846-12	1.834-11	1.833-10	1.831-09
46	1.816-17	2.086-16	3.376-15	4.555-14	4.777-13	4.806-12	4.853-11

Table IV. Ca IX Fractional Level Populations

log(Den.)	8	9	10	11	12	13	14
Key				Population			
47	1.992-18	2.138-17	2.838-16	3.480-15	3.615-14	3.784-13	5.340-12
48	4.396-18	3.149-16	1.610-14	2.794-13	3.016-12	3.042-11	3.064-10
49	8.802-17	8.941-16	9.605-15	1.021-13	1.033-12	1.034-11	1.038-10
50	1.132-16	1.153-15	1.255-14	1.348-13	1.366-12	1.368-11	1.374-10
51	1.461-16	1.541-15	1.924-14	2.274-13	2.340-12	2.347-11	2.354-10
52	2.555-17	2.550-16	2.530-15	2.511-14	2.508-13	2.507-12	2.508-11
53	9.236-16	9.165-15	8.823-14	8.510-13	8.451-12	8.444-11	8.434-10
54	3.048-18	3.320-17	4.618-16	5.804-15	6.028-14	6.058-13	6.119-12
55	4.618-18	5.114-17	7.482-16	9.648-15	1.006-13	1.011-12	1.022-11
56	3.769-18	4.296-17	6.816-16	9.120-15	9.554-14	9.619-13	9.802-12
57	6.348-18	9.540-17	2.480-15	3.874-14	4.137-13	4.168-12	4.195-11
58	1.420-18	1.448-17	1.583-16	1.706-15	1.729-14	1.737-13	1.783-12
59	4.028-18	4.516-17	6.849-16	8.983-15	9.385-14	9.442-13	9.582-12
60	4.521-18	5.959-17	1.283-15	1.911-14	2.030-13	2.044-12	2.057-11
61	2.859-18	4.759-17	1.384-15	2.214-14	2.370-13	2.389-12	2.409-11
62	7.008-18	7.333-17	8.884-16	1.030-14	1.057-13	1.060-12	1.064-11
63	3.874-16	3.843-15	3.692-14	3.554-13	3.528-12	3.525-11	3.521-10
64	4.571-17	4.637-16	4.952-15	5.240-14	5.294-13	5.301-12	5.310-11
65	7.212-16	7.151-15	6.857-14	6.589-13	6.539-12	6.533-11	6.524-10
66	4.255-18	4.299-17	4.506-16	4.695-15	4.731-14	4.739-13	4.781-12
67	3.359-18	3.845-17	6.166-16	8.287-15	8.687-14	8.739-13	8.829-12
68	2.314-18	2.734-17	4.743-16	6.580-15	6.925-14	6.970-13	7.041-12
69	1.408-18	1.839-17	3.900-16	5.783-15	6.138-14	6.186-13	6.276-12
70	5.479-17	5.547-16	5.873-15	6.172-14	6.228-13	6.238-12	6.276-11
71	2.025-17	2.165-16	2.834-15	3.446-14	3.561-13	3.575-12	3.595-11
72	5.726-17	6.612-16	1.085-14	1.472-13	1.544-12	1.553-11	1.561-10
73	9.728-17	9.686-16	9.486-15	9.304-14	9.270-13	9.266-12	9.265-11
74	1.015-17	1.141-16	1.745-15	2.297-14	2.401-13	2.414-12	2.439-11
75	7.390-18	8.403-17	1.324-15	1.767-14	1.850-13	1.860-12	1.873-11
76	2.828-17	3.643-16	7.533-15	1.109-13	1.176-12	1.184-11	1.191-10
77	6.621-18	6.962-17	8.594-16	1.009-14	1.037-13	1.040-12	1.044-11
78	2.739-17	3.115-16	4.909-15	6.548-14	6.857-13	6.893-12	6.924-11
79	1.545-17	1.558-16	1.618-15	1.673-14	1.684-13	1.686-12	1.704-11
80	5.731-18	6.049-17	7.571-16	8.962-15	9.224-14	9.257-13	9.308-12
81	4.752-17	4.721-16	4.572-15	4.437-14	4.411-13	4.408-12	4.404-11
82	3.356-18	3.566-17	4.566-16	5.481-15	5.653-14	5.680-13	5.764-12
83	4.295-18	4.626-17	6.209-16	7.656-15	7.929-14	7.973-13	8.112-12
84	1.920-18	2.173-17	3.385-16	4.492-15	4.701-14	4.728-13	4.773-12
85	5.492-18	7.354-17	1.625-15	2.439-14	2.592-13	2.610-12	2.625-11
86	8.023-19	9.317-18	1.550-16	2.116-15	2.222-14	2.239-13	2.292-12
87	1.079-18	1.571-17	3.921-16	6.069-15	6.473-14	6.524-13	6.592-12
88	8.625-19	1.794-17	6.243-16	1.031-14	1.107-13	1.117-12	1.125-11
89	1.493-17	1.582-16	2.004-15	2.389-14	2.462-13	2.471-12	2.482-11
90	1.344-17	1.408-16	1.713-15	1.991-14	2.043-13	2.050-12	2.058-11
91	9.037-18	9.512-17	1.178-15	1.386-14	1.425-13	1.429-12	1.434-11
92	2.121-16	2.106-15	2.034-14	1.969-13	1.956-12	1.955-11	1.953-10

Table IV. Ca IX Fractional Level Populations

log(Den.)	8	9	10	11	12	13	14
Key				Population			
93	3.970-17	3.979-16	4.021-15	4.060-14	4.067-13	4.068-12	4.069-11
94	2.042-17	2.084-16	2.287-15	2.473-14	2.508-13	2.512-12	2.516-11
95	1.224-17	1.239-16	1.310-15	1.375-14	1.387-13	1.389-12	1.392-11
96	6.179-18	6.295-17	6.848-16	7.353-15	7.448-14	7.460-13	7.476-12
97	3.217-18	3.297-17	3.677-16	4.025-15	4.090-14	4.098-13	4.108-12
98	3.720-17	3.748-16	3.886-15	4.012-14	4.036-13	4.040-12	4.049-11
99	4.916-17	4.965-16	5.202-15	5.419-14	5.460-13	5.466-12	5.480-11
100	6.391-17	6.594-16	7.565-15	8.452-14	8.619-13	8.639-12	8.654-11
101	2.609-16	2.590-15	2.500-14	2.418-13	2.402-12	2.400-11	2.398-10
102	1.660-17	1.664-16	1.680-15	1.695-14	1.698-13	1.698-12	1.699-11
103	2.054-17	2.056-16	2.068-15	2.080-14	2.082-13	2.082-12	2.083-11
104	2.391-17	2.402-16	2.454-15	2.501-14	2.510-13	2.511-12	2.512-11
105	3.313-17	3.293-16	3.199-15	3.112-14	3.096-13	3.094-12	3.091-11
106	1.934-19	1.988-18	2.246-17	2.481-16	2.526-15	2.531-14	2.539-13
107	3.145-19	3.215-18	3.551-17	3.859-16	3.917-15	3.924-14	3.937-13
108	4.347-19	4.535-18	5.432-17	6.253-16	6.407-15	6.426-14	6.446-13
109	5.769-18	5.736-17	5.579-16	5.436-15	5.409-14	5.406-13	5.401-12
110	1.799-18	2.064-17	3.332-16	4.491-15	4.709-14	4.737-13	4.785-12
111	2.174-19	2.302-18	2.914-17	3.474-16	3.592-15	3.727-14	4.962-13
112	1.046-19	5.703-18	2.796-16	4.831-15	5.213-14	5.258-13	5.296-12
113	3.577-19	2.354-17	1.190-15	2.062-14	2.226-13	2.245-12	2.261-11
114	2.190-19	2.606-18	4.597-17	6.417-16	6.761-15	6.821-14	7.056-13
115	2.852-20	2.989-19	3.641-18	4.238-17	4.350-16	4.364-15	4.387-14
116	2.954-20	5.101-19	1.536-17	2.474-16	2.650-15	2.671-14	2.690-13
117	3.088-20	3.411-19	4.957-18	6.369-17	6.635-16	6.667-15	6.705-14
118	1.585-19	1.665-18	2.044-17	2.391-16	2.456-15	2.466-14	2.494-13
119	1.475-19	1.544-18	1.876-17	2.180-16	2.237-15	2.246-14	2.270-13
120	1.713-19	1.866-18	2.600-17	3.270-16	3.396-15	3.411-14	3.425-13
121	2.270-19	2.585-18	4.092-17	5.470-16	5.730-15	5.763-14	5.819-13
122	6.838-20	7.348-19	9.786-18	1.202-16	1.246-15	1.273-14	1.498-13
123	1.812-19	7.443-18	3.435-16	5.895-15	6.358-14	6.412-13	6.458-12
124	5.446-19	5.424-18	5.317-17	5.220-16	5.201-15	5.199-14	5.196-13
125	2.569-19	2.784-18	3.814-17	4.756-16	4.934-15	4.963-14	5.059-13
126	4.713-19	5.282-18	7.998-17	1.048-15	1.095-14	1.101-13	1.114-12
127	8.395-19	8.423-18	8.553-17	8.673-16	8.695-15	8.698-14	8.702-13
128	3.799-19	4.236-18	6.323-17	8.232-16	8.593-15	8.658-14	8.920-13
129	1.266-19	1.338-18	1.682-17	1.996-16	2.056-15	2.068-14	2.126-13
130	2.528-19	3.204-18	6.435-17	9.389-16	9.945-15	1.002-13	1.016-12
131	4.434-19	8.217-18	2.629-16	4.282-15	4.593-14	4.629-13	4.662-12
132	3.330-19	5.979-18	1.864-16	3.021-15	3.239-14	3.265-13	3.289-12
133	2.365-19	3.553-18	9.232-17	1.442-15	1.540-14	1.552-13	1.563-12
134	2.507-19	3.250-18	6.803-17	1.005-15	1.066-14	1.074-13	1.083-12
135	7.967-19	8.048-18	8.434-17	8.788-16	8.854-15	8.862-14	8.871-13
136	5.200-19	5.666-18	7.893-17	9.929-16	1.031-14	1.038-13	1.060-12
137	7.461-19	8.470-18	1.329-16	1.770-15	1.853-14	1.864-13	1.886-12
138	1.258-19	1.472-18	2.496-17	3.433-16	3.609-15	3.639-14	3.741-13

Table IV. Ca IX Fractional Level Populations

log(Den.)	8	9	10	11	12	13	14
Key				Population			
139	5.185-19	5.758-18	8.500-17	1.101-15	1.148-14	1.156-13	1.190-12
140	4.170-19	5.942-18	1.441-16	2.215-15	2.361-14	2.379-13	2.406-12
141	5.532-19	9.506-18	2.850-16	4.586-15	4.912-14	4.951-13	4.988-12
142	2.950-18	4.600-17	1.249-15	1.969-14	2.105-13	2.121-12	2.135-11
143	3.606-19	5.415-18	1.406-16	2.197-15	2.346-14	2.364-13	2.386-12
144	2.415-20	2.644-19	3.742-18	4.746-17	4.935-16	4.960-15	5.003-14
145	2.089-19	3.445-18	9.929-17	1.586-15	1.697-14	1.710-13	1.724-12
146	6.909-20	1.203-18	3.650-17	5.888-16	6.309-15	6.358-14	6.403-13
147	3.067-19	3.722-18	6.852-17	9.714-16	1.025-14	1.032-13	1.040-12
148	1.290-20	1.321-19	1.466-18	1.599-17	1.624-16	1.628-15	1.634-14
149	2.062-20	2.122-19	2.408-18	2.669-17	2.718-16	2.724-15	2.736-14
150	2.909-20	3.082-19	3.908-18	4.663-17	4.805-16	4.822-15	4.839-14
151	2.341-18	2.551-17	3.552-16	4.468-15	4.641-14	4.668-13	4.749-12
152	7.402-19	8.551-18	1.404-16	1.905-15	2.000-14	2.015-13	2.062-12
153	2.452-19	4.172-18	1.239-16	1.990-15	2.132-14	2.148-13	2.163-12
154	2.256-20	2.260-19	2.281-18	2.300-17	2.304-16	2.305-15	2.305-14
155	1.901-19	2.096-18	3.026-17	3.877-16	4.037-15	4.063-14	4.151-13
156	1.207-18	1.227-17	1.324-16	1.412-15	1.428-14	1.430-13	1.433-12
157	6.295-19	6.822-18	9.343-17	1.165-15	1.208-14	1.215-13	1.238-12
158	5.258-19	6.022-18	9.674-17	1.301-15	1.364-14	1.372-13	1.388-12
159	2.103-19	2.427-18	3.972-17	5.385-16	5.652-15	5.695-14	5.839-13
160	4.610-19	4.833-18	5.900-17	6.876-16	7.061-15	7.102-14	7.317-13
161	2.765-19	3.101-18	4.704-17	6.170-16	6.448-15	6.498-14	6.704-13
162	2.285-19	2.746-18	4.952-17	6.968-16	7.348-15	7.400-14	7.509-13
163	1.354-19	1.612-18	2.846-17	3.974-16	4.187-15	4.219-14	4.315-13
164	1.951-19	2.972-18	7.847-17	1.230-15	1.314-14	1.325-13	1.339-12
165	2.729-19	4.899-18	1.527-16	2.475-15	2.653-14	2.674-13	2.694-12
166	6.232-19	1.090-17	3.321-16	5.360-15	5.743-14	5.789-13	5.830-12
167	1.068-19	2.160-18	7.376-17	1.214-15	1.304-14	1.315-13	1.327-12
168	2.004-19	4.002-18	1.355-16	2.228-15	2.392-14	2.411-13	2.429-12
169	4.334-19	7.086-18	2.024-16	3.226-15	3.452-14	3.479-13	3.503-12
170	2.902-19	3.722-18	7.638-17	1.122-15	1.189-14	1.197-13	1.207-12
171	3.650-20	3.748-19	4.218-18	4.647-17	4.728-16	4.738-15	4.752-14
172	4.977-19	6.436-18	1.341-16	1.978-15	2.098-14	2.113-13	2.133-12
173	3.926-19	5.269-18	1.169-16	1.756-15	1.866-14	1.879-13	1.893-12
174	2.069-19	3.044-18	7.705-17	1.197-15	1.277-14	1.286-13	1.295-12
175	2.150-19	2.981-18	6.956-17	1.059-15	1.127-14	1.136-13	1.147-12
176	2.800-19	3.441-18	6.503-17	9.302-16	9.829-15	9.892-14	9.961-13
177	1.057-19	1.717-18	4.873-17	7.757-16	8.300-15	8.364-14	8.423-13
178	3.331-19	3.865-18	6.417-17	8.751-16	9.190-15	9.243-14	9.300-13
179	4.707-19	5.494-18	9.253-17	1.269-15	1.334-14	1.342-13	1.351-12
180	2.348-19	2.472-18	3.069-17	3.614-16	3.717-15	3.729-14	3.743-13
181	3.844-20	5.690-19	1.451-17	2.258-16	2.410-15	2.428-14	2.445-13
182	5.623-20	7.943-19	1.903-17	2.916-16	3.107-15	3.130-14	3.155-13
183	1.887-18	1.920-17	2.082-16	2.230-15	2.258-14	2.261-13	2.265-12
184	3.872-20	3.971-19	4.442-18	4.872-17	4.953-16	4.963-15	4.979-14

Table IV. Ca IX Fractional Level Populations

log(Den.)	8	9	10	11	12	13	14
Key				Population			
185	1.259-20	1.260-19	1.266-18	1.272-17	1.273-16	1.273-15	1.279-14
186	7.073-20	7.307-19	8.428-18	9.452-17	9.644-16	9.668-15	9.695-14
187	2.766-19	2.801-18	2.967-17	3.120-16	3.149-15	3.152-14	3.156-13
188	1.930-19	2.114-18	2.992-17	3.795-16	3.946-15	3.964-14	3.988-13
189	1.328-20	1.436-19	1.947-18	2.415-17	2.504-16	2.514-15	2.530-14
190	1.506-19	1.556-18	1.792-17	2.008-16	2.048-15	2.054-14	2.068-13
191	8.164-21	9.439-20	1.553-18	2.110-17	2.214-16	2.228-15	2.248-14
192	1.639-20	1.942-19	3.387-18	4.707-17	4.956-16	4.986-15	5.018-14
193	9.410-21	1.103-19	1.878-18	2.586-17	2.719-16	2.736-15	2.763-14
194	2.087-19	2.215-18	2.828-17	3.388-16	3.494-15	3.507-14	3.528-13
195	2.469-19	2.764-18	4.177-17	5.468-16	5.711-15	5.739-14	5.765-13
196	5.495-21	5.640-20	6.335-19	6.970-18	7.089-17	7.104-16	7.122-15
197	2.525-21	2.661-20	3.310-19	3.903-18	4.015-17	4.029-16	4.053-15
198	3.303-21	3.615-20	5.107-19	6.470-18	6.727-17	6.758-16	6.794-15
199	2.795-21	3.045-20	4.240-19	5.333-18	5.538-17	5.563-16	5.593-15
200	2.351-21	2.368-20	2.447-19	2.520-18	2.533-17	2.535-16	2.540-15
201	5.513-21	5.600-20	6.019-19	6.402-18	6.474-17	6.483-16	6.493-15
202	3.851-21	3.911-20	4.195-19	4.454-18	4.503-17	4.509-16	4.517-15
203	1.524-20	1.552-19	1.684-18	1.805-17	1.827-16	1.830-15	1.834-14
204	9.084-21	9.198-20	9.744-19	1.024-17	1.034-16	1.035-15	1.037-14
205	3.120-21	3.183-20	3.485-19	3.762-18	3.813-17	3.820-16	3.826-15
206	2.670-19	2.652-18	2.564-17	2.484-16	2.469-15	2.467-14	2.465-13
207	4.725-20	4.765-19	4.959-18	5.137-17	5.170-16	5.174-15	5.180-14
208	1.588-20	1.583-19	1.558-18	1.535-17	1.530-16	1.530-15	1.529-14
209	1.812-20	1.837-19	1.955-18	2.062-17	2.082-16	2.085-15	2.088-14
210	6.165-21	6.199-20	6.359-19	6.505-18	6.533-17	6.536-16	6.546-15
211	1.006-20	1.010-19	1.033-18	1.053-17	1.057-16	1.058-15	1.059-14
212	1.402-20	1.426-19	1.540-18	1.644-17	1.664-16	1.666-15	1.668-14
213	3.198-20	3.192-19	3.165-18	3.139-17	3.135-16	3.134-15	3.133-14
214	1.812-21	1.901-20	2.323-19	2.709-18	2.782-17	2.791-16	2.804-15
215	1.889-21	1.925-20	2.095-19	2.250-18	2.279-17	2.283-16	2.294-15
216	3.088-21	3.197-20	3.716-19	4.191-18	4.280-17	4.291-16	4.307-15
217	4.261-21	4.446-20	5.327-19	6.133-18	6.284-17	6.303-16	6.325-15
218	5.653-21	5.706-20	5.958-19	6.189-18	6.233-17	6.240-16	6.259-15
219	7.707-21	7.831-20	8.422-19	8.962-18	9.064-17	9.077-16	9.102-15
220	1.007-20	1.043-19	1.211-18	1.365-17	1.394-16	1.397-15	1.400-14
221	7.434-21	7.611-20	8.457-19	9.230-18	9.375-17	9.392-16	9.409-15
222	4.577-21	4.603-20	4.728-19	4.842-18	4.864-17	4.868-16	4.881-15
223	1.585-21	1.609-20	1.726-19	1.833-18	1.853-17	1.856-16	1.860-15
224	1.616-20	1.654-19	1.836-18	2.002-17	2.034-16	2.038-15	2.043-14
225	3.660-20	3.648-19	3.593-18	3.543-17	3.533-16	3.532-15	3.531-14
226	3.138-21	3.182-20	3.391-19	3.582-18	3.618-17	3.623-16	3.630-15
227	2.851-21	2.869-20	2.953-19	3.031-18	3.045-17	3.047-16	3.052-15
228	4.659-21	4.691-20	4.843-19	4.982-18	5.009-17	5.012-16	5.020-15
229	6.521-21	6.619-20	7.087-19	7.515-18	7.595-17	7.605-16	7.614-15
230	8.326-21	8.379-20	8.632-19	8.863-18	8.906-17	8.913-16	8.937-15

Table IV. Ca IX Fractional Level Populations

log(Den.)	8	9	10	11	12	13	14
Key				Population			
231	1.060-20	1.076-19	1.151-18	1.220-17	1.233-16	1.234-15	1.237-14
232	1.280-20	1.317-19	1.497-18	1.662-17	1.693-16	1.697-15	1.700-14
233	3.731-21	3.724-20	3.692-19	3.663-18	3.658-17	3.657-16	3.656-15
234	6.961-21	6.957-20	6.938-19	6.920-18	6.916-17	6.916-16	6.916-15
235	2.708-21	2.733-20	2.852-19	2.961-18	2.981-17	2.984-16	2.990-15
236	3.782-21	3.838-20	4.102-19	4.344-18	4.389-17	4.395-16	4.403-15
237	4.868-21	4.965-20	5.429-19	5.853-18	5.933-17	5.943-16	5.953-15
238	1.884-20	1.888-19	1.906-18	1.922-17	1.925-16	1.925-15	1.926-14
239	2.774-21	2.761-20	2.699-19	2.643-18	2.633-17	2.632-16	2.638-15
240	8.250-21	8.343-20	8.786-19	9.191-18	9.267-17	9.277-16	9.292-15
241	1.388-20	1.412-19	1.526-18	1.631-17	1.651-16	1.653-15	1.655-14
242	7.385-21	7.565-20	8.423-19	9.207-18	9.355-17	9.373-16	9.398-15
243	2.509-21	2.601-20	3.041-19	3.443-18	3.519-17	3.528-16	3.544-15
244	1.123-20	1.140-19	1.220-18	1.293-17	1.306-16	1.308-15	1.314-14
245	1.365-20	1.402-19	1.574-18	1.732-17	1.762-16	1.766-15	1.772-14
246	1.611-20	1.689-19	2.059-18	2.398-17	2.462-16	2.469-15	2.476-14
247	1.605-21	1.737-20	2.369-19	2.946-18	3.055-17	3.070-16	3.104-15
248	1.698-21	1.914-20	2.949-19	3.894-18	4.072-17	4.096-16	4.143-15
249	2.183-21	2.786-20	5.666-19	8.298-18	8.794-17	8.852-16	8.907-15
250	2.569-21	2.616-20	2.837-19	3.040-18	3.078-17	3.083-16	3.089-15
251	6.173-22	6.563-21	8.429-20	1.014-18	1.046-17	1.050-16	1.056-15
252	8.225-22	8.520-21	9.932-20	1.122-18	1.146-17	1.150-16	1.156-15
253	6.374-22	6.670-21	8.086-20	9.380-19	9.624-18	9.657-17	9.723-16
254	9.955-22	1.050-20	1.310-19	1.549-18	1.593-17	1.599-16	1.606-15
255	7.609-22	8.107-21	1.049-19	1.266-18	1.307-17	1.313-16	1.320-15
256	1.186-21	1.262-20	1.625-19	1.957-18	2.019-17	2.027-16	2.036-15
257	7.643-22	8.373-21	1.186-19	1.505-18	1.565-17	1.573-16	1.583-15
258	1.040-21	1.050-20	1.099-19	1.143-18	1.151-17	1.152-16	1.154-15
259	1.319-21	1.340-20	1.443-19	1.538-18	1.555-17	1.557-16	1.560-15
260	1.530-21	1.565-20	1.734-19	1.889-18	1.918-17	1.921-16	1.925-15
261	1.168-21	1.177-20	1.220-19	1.259-18	1.267-17	1.267-16	1.269-15
262	1.377-21	1.390-20	1.452-19	1.508-18	1.519-17	1.521-16	1.527-15
263	2.434-21	2.504-20	2.838-19	3.144-18	3.202-17	3.209-16	3.219-15
264	3.298-21	3.408-20	3.934-19	4.414-18	4.505-17	4.516-16	4.530-15
265	6.164-21	6.192-20	6.329-19	6.453-18	6.477-17	6.480-16	6.484-15
266	2.472-21	2.515-20	2.720-19	2.908-18	2.943-17	2.948-16	2.961-15
267	9.467-22	9.528-21	9.817-20	1.008-18	1.013-17	1.014-16	1.015-15
268	1.315-21	1.330-20	1.404-19	1.472-18	1.485-17	1.486-16	1.488-15
269	2.511-21	2.538-20	2.664-19	2.780-18	2.802-17	2.804-16	2.807-15
270	2.880-21	2.967-20	3.380-19	3.758-18	3.829-17	3.838-16	3.852-15
271	3.274-21	3.443-20	4.250-19	4.988-18	5.126-17	5.143-16	5.157-15
272	7.071-21	7.270-20	8.218-19	9.084-18	9.247-17	9.267-16	9.292-15
273	4.216-21	4.310-20	4.758-19	5.169-18	5.246-17	5.256-16	5.271-15
274	1.448-21	1.492-20	1.704-19	1.898-18	1.934-17	1.939-16	1.942-15
275	3.035-20	3.023-19	2.962-18	2.906-17	2.895-16	2.894-15	2.892-14
276	2.276-21	2.394-20	2.958-19	3.473-18	3.570-17	3.582-16	3.597-15

Table IV. Ca IX Fractional Level Populations

log(Den.)	8	9	10	11	12	13	14
Key	Population						
277	4.495-21	4.497-20	4.506-19	4.513-18	4.515-17	4.515-16	4.516-15
278	3.291-21	3.293-20	3.306-19	3.317-18	3.319-17	3.319-16	3.319-15
279	1.930-21	1.937-20	1.971-19	2.002-18	2.007-17	2.008-16	2.008-15
280	1.194-20	1.189-19	1.163-18	1.139-17	1.134-16	1.134-15	1.133-14
281	2.132-20	2.119-19	2.058-18	2.001-17	1.991-16	1.989-15	1.988-14
282	1.476-21	1.556-20	1.938-19	2.288-18	2.354-17	2.362-16	2.374-15
283	1.090-20	1.084-19	1.053-18	1.025-17	1.020-16	1.019-15	1.019-14

Table V. Intensities of Selected Bright Ca IX Lines

log(Den.)			8	9	10	11	12	13	14
j	i	Wavelength				Intensity			
92	5	108.071	6.47-06	6.43-05	6.21-04	6.01-03	5.97-02	5.96-01	5.96+00
65	5	116.190	3.07-05	3.04-04	2.91-03	2.80-02	2.78-01	2.78+00	2.77+01
35	1	120.147	4.32-05	4.29-04	4.14-03	4.00-02	3.98-01	3.97+00	3.97+01
30	1	120.565	2.99-06	3.01-05	3.10-04	3.18-03	3.19-02	3.20-01	3.24+00
43	3	129.428	5.95-06	6.04-05	6.43-04	6.79-03	6.86-02	6.87-01	6.89+00
44	4	129.935	1.09-05	1.13-04	1.32-03	1.50-02	1.53-01	1.53+00	1.54+01
100	13	133.820	3.51-06	3.62-05	4.16-04	4.64-03	4.74-02	4.75-01	4.75+00
45	5	141.357	4.39-05	4.35-04	4.20-03	4.07-02	4.04-01	4.04+00	4.03+01
101	14	144.344	1.14-05	1.13-04	1.09-03	1.06-02	1.05-01	1.05+00	1.05+01
53	6	159.540	2.52-05	2.50-04	2.40-03	2.32-02	2.30-01	2.30+00	2.30+01
27	3	162.374	4.19-06	4.50-05	5.96-04	7.30-03	7.55-02	7.58-01	7.62+00
27	4	163.231	7.05-06	7.57-05	1.00-03	1.23-02	1.27-01	1.27+00	1.28+01
48	8	165.424	4.67-08	3.34-06	1.71-04	2.97-03	3.20-02	3.23-01	3.25+00
48	9	166.415	1.35-07	9.70-06	4.96-04	8.60-03	9.29-02	9.37-01	9.43+00
28	5	178.575	4.23-04	4.19-03	4.02-02	3.86-01	3.83+00	3.83+01	3.82+02
49	11	184.336	9.29-06	9.43-05	1.01-03	1.08-02	1.09-01	1.09+00	1.10+01
50	12	184.374	1.26-05	1.29-04	1.40-03	1.51-02	1.53-01	1.53+00	1.53+01
51	13	184.432	1.84-05	1.94-04	2.42-03	2.86-02	2.94-01	2.95+00	2.96+01
35	6	201.589	1.26-05	1.25-04	1.21-03	1.17-02	1.16-01	1.16+00	1.16+01
53	14	201.847	8.40-05	8.33-04	8.02-03	7.74-02	7.68-01	7.68+00	7.67+01
33	12	239.030	1.55-06	1.99-05	4.07-04	5.98-03	6.34-02	6.38-01	6.42+00
33	13	239.135	8.69-06	1.11-04	2.29-03	3.36-02	3.56-01	3.58+00	3.60+01
30	12	239.783	6.39-06	6.43-05	6.63-04	6.81-03	6.84-02	6.85-01	6.93+00
29	11	239.881	3.84-06	4.18-05	5.77-04	7.23-03	7.50-02	7.53-01	7.59+00
25	6	324.088	1.98-05	1.98-04	1.98-03	1.99-02	1.99-01	1.99+00	1.99+01
11	2	371.896	7.90-05	8.49-04	1.13-02	1.39-01	1.44+00	1.45+01	1.46+02
12	3	373.799	1.02-04	1.14-03	1.67-02	2.17-01	2.26+00	2.27+01	2.31+02
11	3	373.986	5.81-05	6.25-04	8.33-03	1.02-01	1.06+00	1.07+01	1.08+02
13	4	378.086	1.92-04	2.70-03	6.45-02	9.88-01	1.05+01	1.06+02	1.07+03
12	4	378.375	3.29-05	3.65-04	5.38-03	6.96-02	7.26-01	7.30+00	7.43+01
11	4	378.567	3.74-06	4.02-05	5.35-04	6.58-03	6.81-02	6.84-01	6.92+00
23	8	383.457	6.88-07	1.23-05	3.82-04	6.20-03	6.64-02	6.69-01	6.74+00
22	8	384.275	6.17-07	1.08-05	3.29-04	5.32-03	5.70-02	5.74-01	5.79+00
20	7	385.518	8.36-07	9.86-06	1.70-04	2.36-03	2.48-02	2.50-01	2.57+00
24	9	388.761	1.01-06	2.39-05	8.98-04	1.50-02	1.61-01	1.63+00	1.64+01
23	9	388.827	9.36-07	1.67-05	5.20-04	8.43-03	9.04-02	9.11-01	9.17+00
19	8	389.934	2.51-06	2.82-05	4.26-04	5.59-03	5.84-02	5.87-01	5.97+00
26	10	391.737	6.93-06	6.92-05	6.87-04	6.81-03	6.81-02	6.80-01	6.80+00
14	5	395.022	1.52-03	1.51-02	1.45-01	1.39+00	1.38+01	1.38+02	1.38+03
18	6	424.366	4.37-06	4.56-05	5.49-04	6.34-03	6.50-02	6.52-01	6.55+00
15	6	439.747	8.89-07	1.01-05	1.58-04	2.11-03	2.20-02	2.22-01	2.26+00
5	1	466.240	4.15-02	4.12-01	3.95+00	3.80+01	3.77+02	3.76+03	3.76+04
9	3	498.011	1.72-05	4.09-04	1.54-02	2.58-01	2.77+00	2.79+01	2.82+02
8	2	503.272	3.22-05	4.81-04	1.24-02	1.93-01	2.06+00	2.08+01	2.10+02
9	4	506.168	4.99-05	1.18-03	4.46-02	7.46-01	8.02+00	8.09+01	8.16+02
8	3	507.108	2.36-05	3.53-04	9.08-03	1.41-01	1.51+00	1.52+01	1.54+02

Table V. Intensities of Selected Bright Ca IX Lines

log(Den.)			8	9	10	11	12	13	14
j	i	Wavelength				Intensity			
7	3	512.052	1.82-06	2.12-05	3.58-04	4.91-03	5.19-02	5.47-01	8.02+00
8	4	515.567	3.73-05	5.57-04	1.43-02	2.23-01	2.39+00	2.40+01	2.43+02
6	3	521.859	1.39-04	1.38-03	1.35-02	1.33-01	1.32+00	1.32+01	1.32+02
23	12	525.048	3.71-07	6.64-06	2.06-04	3.34-03	3.58-02	3.61-01	3.64+00
24	13	525.484	2.27-07	5.36-06	2.01-04	3.36-03	3.62-02	3.65-01	3.69+00
6	4	530.822	2.86-04	2.85-03	2.79-02	2.74-01	2.73+00	2.73+01	2.73+02
19	13	537.852	1.23-06	1.38-05	2.09-04	2.74-03	2.86-02	2.88-01	2.92+00
10	5	542.262	1.06-05	1.06-04	1.08-03	1.10-02	1.10-01	1.11+00	1.11+01
25	14	564.402	8.92-06	8.93-05	8.94-04	8.95-03	8.95-02	8.95-01	8.95+00
17	13	641.891	3.76-06	8.88-05	3.33-03	5.57-02	5.99-01	6.04+00	6.08+01
16	12	651.251	2.46-06	3.58-05	8.97-04	1.39-02	1.48-01	1.50+00	1.53+01
16	13	652.109	3.87-07	5.64-06	1.41-04	2.19-03	2.33-02	2.35-01	2.40+00
15	11	659.471	4.14-06	4.69-05	7.36-04	9.80-03	1.03-01	1.03+00	1.05+01
15	12	660.054	8.90-07	1.01-05	1.58-04	2.11-03	2.21-02	2.22-01	2.26+00
3	1	691.421	9.89-04	1.01-02	1.12-01	1.22+00	1.24+01	1.24+02	1.24+03
9	5	763.669	2.56-07	6.09-06	2.29-04	3.83-03	4.12-02	4.16-01	4.19+00
6	5	821.215	8.11-04	8.07-03	7.91-02	7.76-01	7.73+00	7.73+01	7.72+02