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ERTS/NIMBUS RADIATION ENVIRONMENT INFORMATION

E. G. STASSINOPOULOS

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GODDARD SPACE FLIGHT CENTER
GREENBELT, MARYLAND

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NASA-Goddard Space Flight Center
Space and Earth Sciences Directorate
National Space Science Data Center

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Foreword

Trapped particle radiation levels on ERTS/NIMBUS spacecraft were calculated for nominal trajectories using improved computational methods and new electron environment models. Temporal variations of the electron fluxes were considered and partially accounted for. Magnetic field calculations were performed with a current field model, extrapolated to a later epoch with linear time terms. Orbital flux integration results are presented in graphical and atbular form; they are analyzed, explained, and dicussed.

This report supersedes all past issuances or releases regarding Van Allen belt radiation on ERTS/NIMBUS satellites. The information contained in the present report replaces all previously distributed data.

Contents

Appendices

Introduction

The planning for the ERTS/NIMBUS satellites provides for circular, near polar flight paths at about 926/1111 kilometers altitude with launchings in 1972, 1973, and 1975.

The high inclination of the ERTS/NIMBUS trajectories and the proximity of the launch dates to the period within the solar cycle characterized by minimum solar activity require special considerations when evaluating the electron results because of the latest environment representations.

Specifically, two new electron environment models were used in the flux calculations: the AE5 for the inner zone ($1.1 < L \leq 2.8$) by Teague and Vette, 1972, and the AE4 for the outer zone ($2.8 \leq L < 11.$) by Singley and Vette, 1972. Both are static models describing the environment as it existed in October 1967, at about solar maximum conditions.

In constructing these models it was possible to infer a change of the average quiet-time electron flux levels as a function of the solar cycle. A complete temporal description of this solar cycle dependence is not available at this time. However, additional versions of the AE5/AE4 models for the 1964 solar minimum epoch will be released soon.

In the meantime, it is expected that the results presented in this report overestimate the expected vehicle encountered electron fluxes because the launch dates of the ERTS/NIMBUS satellites are closer to the next epoch of solar minimum activity (1974-75) than to the solar max epoch of the current AE5/AE4 environment models (1967-68).

It should be noted that the inner zone environment in 1967 still included remnants of the artificial electrons, injected into the magnetosphere by the Starfish nuclear explosion of 1962 (Teague and Stassinopoulos, 1972). Since the residual Starfish components contained in the AE5 model are significant at some L values and for some energies, it was necessary to update the model to the launch epochs of the ERTS/NIMBUS satellites.

Approximate dates at which the Starfish fluxes had decayed down to natural background levels (Teague and Stassinopoulos, 1972) and apparent decay lifetimes for the artificials (Stassinopoulos and Verzariu, 1971) were available as functions of energy and L. Using these cutoff times and lifetimes, the artificial component was removed from the model data by an exponential decay function.

No special considerations are required for the proton results, obtained from standard models long in use. Although they describe a static environment, this is a valid representation for these particles because experimental measurements have shown that no significant changes with time have occurred in the proton population. With the exception of the fringe areas of the proton belt, that is, at very low altitudes and at the outer edges of the trapping region, the possible error introduced by the static approximation lies well within the uncertainty factor attached to the models. Consequently, the proton data may be applied to any epoch without the need for an updating process.

Appendix A contains pertinent information on units, field models, trajectory generation and conversion, etc.

Two new sections, Appendixes B and C, have been added to this report, relating to the enclosed tables and plots, explaining their format and describing their data.

A further addition to the output data and the reference material usually included in our reports is:

a) a projection of the satellite trajectory on a world map grid drawn in Miller cylindrical coordinates, where the start of each successive orbit (revolution) is sequentially numbered,
b) a trace of the flight path in magnetic B-L space after conversion from geocentric geographic (geodetic system) to geocentric geomagnetic (B-L system) coordinates,
c) computer produced exposure analysis table,
d) computer produced time account table.

Novel features in our old tables, besides improved headlines and labels, are:

a) new constant L-band intervals on the first output table, extending now to L=8.2,
b) L-band tables also generated for protons,
c) complete description of low energy protons included as a standard procedure in all studies,
d) spectral distribution given also in average orbit-integrated instantaneous fluxes.

At this point we should emphasize that our calculations are only approximations due to the large uncertainties in future flux levels; as always, we strongly recommend that all persons receiving parts of this report be advised about this uncertainty (see last paragraph of Appendix A).

Finally, an explanation regarding the attribute "standard", frequently used in the reformatted OFI (Orbital Flux Integration) Study Reports. The term is applied as a modifier to parameters, constants, or variables in order to indicate or refer to some specific value of these quantities that had been used without change over extended periods of time. Although override possibilities do exist in the OFI system, a routinely submitted production run will, by default option, always use these "standard" values. The term is also used in reference to established forms, style, processes, or procedures, as for example, "standard tables", "standard plots", "standard production runs", etc. A list of some quantities, values, or expressions modified by "standard" is given in Table 1.

Results : Analysis and Discussion

The outcome of our calculations is summarized in Tables 2 to 21 (2 to 11 for ERTS, 12 to 21 for NIMBUS),which are all computer produced. The tables are arranged (separately for each satellite) in four sets, where every set pertains to one specific type of table : the first set contains the "L-band" tables, the second the "Spectral Distribution and Exposure Index" tables, the third the tables of "Peaks", and the fourth the "Exposure Analysis" summary and the "Time Account" breakdown. All sets except the last contain three similar members : one for low energy protons, one for high energy protons, and one for electrons, in that order. Further explanations on the tables and a more detailed description of their contents is given in Appendix B . Figure 1 is a guide to table arrangement, as produced by a standard production run of the Orbital Flux Integration (OFI) program UNIFLUX .

Some of the tabulated data is also computer plotted in Figures 3-11 for the ERTS and Figures 14-22 for the NIMBUS, with additional Figures 12-13 (ERTS) and 23-24 (NIMBUS) containing plots of flight path data. As with the tables, the plots are arranged (separately for the two satellites) in four sets, where each set pertains to one specific type of plot : the first set contains "Time and Flux Histograms", the second "Spectral Profiles", the third "Peaks per Orbit", and the fourth trajectory "World Map Projections" and "B-L Space Tracings" . Again, all sets except the last contain three similar members : one for each type of particle considered. The last set contains two independent members. Appendix C describes and explains the plots. Figure 2 is a guide plot arrangement, as produced by a standard production run .

I. Trajectory Data

See Figures 12/23 for World Map Projections and Figures 13/24 for B-L Space Tracings.

High inclination circular and elliptical trajectories ($i > 55^o$) or low inclination elliptical orbits of large eccentricity traverse the entire **terrestrial radiation belt twice during each revolution.** The vehicle thus executes a transverse motion in L-space, passing successively through a region of low L values ($1.0 < L < 2.8$) and of high L values ($2.8 < L < 11.$), commonly referred to as the inner zone and the outer zone . The specified ERTS/NIMBUS trajectories fall into that category.

Under unperturbed conditions, the relative orbit period determines the nodal precession of the trajectory. For circular flight paths the period is a simple function of the geocentric distance. At the altitudes proposed for the ERTS/NIMBUS missions, the periods are about 1.7/1.8 hours with a corresponding precession of 25.5/27.0 degrees approximately. This amounts to about 14.1/13.3 orbits for a twentyfour hour flight-time duration. Now in the case of circular trajectories with large inclinations, the possibility exists that, when successive orbits lie more than 20 degrees apart, the simulated flight path may be "skipping" some high intensity regions of the radiation belts. Normally, this condition can be remedied by extending the flight time to 48 or 96 hours, whereby a denser sampling of the environment is insured. A 48-hour flight duration was considered adequate for the study at hand.

The world map projections of the two trajectories considered are plotted for ten revolutions only. The orbit numbers appear at the starting points of each revolution.

On the respective B-L graphs, only five orbits are plotted forming the depicted patterns. Each orbit crosses the magnetic equator twice at the positions where the curves touch the equatorial line. The rtansverse motion is stricingly displayed. The spreading (displacement) of the traces is the effect of the nodal precession.

II. Spectral Profiles

For tabulated data consult Tables 5-7 (ERTS) and 15-17 (NIMBUS). For plotted data consult Figures 6-8 (ERTS) and 17-19 (NIMBUS).

The integral spectra presented in this report are orbit integrated, statistically averaged, trapped particle spectra, characteristic of the specific trajectories that produced them.

Noteworthy are the electron spectra obtained from the new environment models AE5 and AE4, especially in regards to the steep fall-off to zero flux for $E \geq 5.0$ Mev. The apparent cutoff at about 5. Mev is probably due to the complete decay of the high energy Starfish artificials by 1967, assuming no significant numbers of naturals exist with energies $E \geq 5.0$ Mev.

III. Peaks per Orbit

Tabulated data is contained in Tables 8-10 (ERTS) and 18-20 (NIMBUS). Plotted data is shown in Figures 9-11 (ERTS) and 20-22 (NIMBUS).

The absolute peaks presented in this report have been obtained for standard OFI (Orbital Flux Integration) energies : E - .1 Mev for low energy protons, E - 5. Mev for high energy protons, and E - .5 Mev for electrons.

Obviously the peak contours follow a periodic pattern based on the daily cycle of revolutions (See: "I. Trajectory Data" for more detail). Since the trajectories investigated are circular, no major changes with time are expected, assuming stable orbits and atmospheric drag effects.

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APPENDIX A

General Background Information

For the specified ERTS/NIMBUS flight paths, an orbit tape was generated with the standard integration stepsize of one minute, and for a 48 hour flight-time, in order to insure sufficient sampling coverage. (For more details see: Results, I. Trajectory Data.) The following circular trajectories were thus produced:

Vehicle	Alt(km)	Incl.
ERTS	869	81°
NIMBUS	1111	80°

The orbits were subsequently converted from geocentric polar into magnetic B-L coordinates with McIlwain's INVAR Program of 1965 (Hassit and McIlwain, 1967) and with the field routine ALLMAG by Stassinopoulos and Mead (1972), utilizing the IGRF (1965) geomagnetic field model by Cain and Cain (1971), calculated for the epoch 1970.0 .

Orbital flux integrations were performed with Vette's current models of the environment, the new AE5-AE4 for the inner and outer zone electrons, the AP6-AP7 for high energy protons, and the AP5 for low energy protons. All are static models which do not consider temporal variations; this includes the new electron models, at least as far as the present calculations are concerned. See text for further details on this matter.

The documents that describe these models are listed below:

Model	Reference
AE4	Singley and Vette, 1972
AE5	Teague and Vette, 1972
AP5	King, 1967
AP6	Lavine and Vette, 1969
AP7	Lavine and Vette, 1970

The results, relating to the omnidirectional, vehicle encountered, integral, trapped particle fluxes, are presented in graphical and tabular form with the following unit conventions:

1. Daily averages : total trajectory integrated flux averaged into particles/cm^2 day,
2. Average instantaneous : time integrated average, characteristic of the orbit, in particles/cm^2 sec,
3. Totals per orbit non-averaged, single-orbit integrated flux in particles/cm^2 orbit, and
4. Peaks per orbit highest orbit-encountered instantaneous flux in particles/cm^2 sec,

where one orbit = one revolution.

Please note: we wish to emphasize the fact that the data presented in this report are only approximations. We do not believe the results to be any better than a factor of 2 for the protons and a factor of 3 for the electrons. It is advisable to inform all potential users about this uncertainty in the data.

Please, also note that the electrons have been calculated with a model decribing the environment at solar maximum. The obtained fluxes may, therefore, be an overestimate for the ERTS/NIMBUS missions, which are scheduled to fly around solar minimum. Consequently, it is suggested that the electron results be taken as an upper limit and the uncertainty factor be applied only in its reducing capacity (divisor).

APPENDIX B

Description of Tables

a) The L-band Table:

The table contains 36 L-bands L_i of equal size, covering the range from L - 1.0 to L - 8.2 earth radii in constant increments of .2 earth radii. For the L-intervals determined in this way, orbital spectral functions

$$N(>E,E_N;L_i) = \left[\sum_k J_k(>E;B)\right]_{L_i} \Bigg/ \left[\sum_k J_k(>E_N;B)\right]_{L_i} \qquad \begin{matrix} i=1,36 \\ L_i: L_i < L \leq L_{i+1} \end{matrix} \tag{1}$$

are obtained at nine arbitrary energy levels such that the integral spectrum is equal to 1 for $E = E_N$, where E_N was taken to be .1, 5., and .5 Mev for low energy protons, the high energy protons, and the electrons, respectively. The notation L_i is used to indicate the L-band from L_i to L_{i+1}, while $J(>E;B)$ is the integral, omnidirectional flux yielded by the environment model used in the calculation. The spectral functions N are evaluated for the total flight time simulated in the study, where the summing index k selects all trajectory points lying in each L_i.

The corresponding orbital distribution functions, representing fluxes above energy E_N, are given by ·

$$F(E;L_i) = \Delta t\left[\sum_k J_k(>E;B)\right]_{L_i} \tag{2}$$

where Δt is the constant time increment of orbit integration, whose standard value is 60 seconds. The distribution functions are fluxes accumulated in their respective L_i bands over the total flight period considered.

The orbital distribution functions are listed on the table at the bottom of each L-interval and are labeled "NORMFLUX". The nine integral energy levels selected for the low and high energy protons and for electrons are given below in units of "Mev" for all particles:

Protons Low	Protons High	Electrons
.1*	3.	.0
.5	5.	.5*
.9	10.	1.0
1.1	15.	1.5
1.5	20.	2.0
2.0	25.	2.5
2.5	30.	3.0
3.0	50.	4.0
3.5	100.	5.0

where the normalization energy is indicated by a star (*).

b) The Spectral Distribution and Exposure Index Table:

This table has three parts:

I. The spectrum $\Psi_j(\Delta E)$ given in % for energy intervals that correspond to the energy levels of the previously discussed table (L-bands), with two special columns showing the total orbit integrated flux for these energy intervals averaged into instantaneous I_j^S and daily I_j^D intensities

$$\Psi_j(\Delta E) = 100 \frac{I_j^D(\Delta E)}{F(>E_1)} \qquad j=1,9 \qquad (3)$$

where

$$F(>E_1) = C \sum_{k=1}^{k_0} J_k(>E_1;B,L)\Delta t \qquad (4)$$

$$I_j^D(\Delta E) = C \sum_{k=1}^{k_0} \Delta t \left\{ J_k(>E_j;B,L) - J_k(>E_{j+1};B,L) \right\} \qquad (5)$$

$$I_j^S(\Delta E) = I_j^D(\Delta E)/86400 \qquad (6)$$

$$C = \frac{24}{T} \quad , \quad T = k_0 \Delta t \qquad i=1,36$$

and where k_0 is the upper limit of k. It is equal to the total number of time increments considered in the study.

II. The composite orbit spectrum for integral energies, giving the total vehicle encountered fluxes averaged into daily $S^D(>E_j)$ and instantaneous $S^S(>E_j)$ intensities for 15 discrete energy levels:

$$S^D(>E_j) = c\Delta t \sum_{m=0}^{T} J_m(>E_j) \qquad j=1,15 \qquad (7)$$

$$S^S(>E_j) = S^D(>E_j)/86400 \qquad (8)$$

where the summation is performed for the entire simulated mission duration T and includes all fluxes with energies greater than E_j.

III. The exposure index, given (for the normalization energy used in the L-band table) at nine successive intensity ranges R_n one order of magnitude apart, in terms of exposure duration $\tau(R_n)$, converted to hours, and total number of particles $\phi(>E_N;R_n)$ accumulated while in that intensity range. The notation R_n is used to indicate the intensity range from r_n to r_{n+1}:

$$\phi(>E_N;R_n) = \tau(R_n)\ \theta(>E_N;R_n) \qquad \begin{matrix} n=1,9 \\ R_n \equiv r_n < r \leq r_{n+1} \end{matrix} \tag{9}$$

$$\theta(>E_N;R_n) = \left[\sum_{\ell} J(>E_N;r)\right]_{R_n} \Big/ \zeta_n \tag{10}$$

$$\tau(R_n) = \Delta t\ \zeta_n \tag{11}$$

where ζ_n is the upper limit of ℓ in each R_n.

c) The Table of Peaks:

In this table, the absolute instantaneous peak flux encountered during each successive orbit (revolution) is listed for the indicated energy range. There are nine columns on this table. Column 1 is an orbit counting device, based on the period of the orbit when the trajectory lies in the equatorial plane and is circular, on the physical perigee in all elliptical cases, and on the equatorial crossing for circular inclined trajectories. Column 2 gives the peak flux. Columns 3, 4, and 5 indicate the spacecraft position in geocentric coordinates at which the peak was encountered, while columns 6, 7, and 8 determine respectively the time and the magnetic B-L coordinates for this event. It should be noted that all simulated flight paths for the purpose of orbital radiation studies start at $t_0 = 0$ hours. Finally, the last column indicates the total flux encountered during that particular orbit. It is advisable to disregard the last line on this table because many times that orbit is incomplete and the fluxes or positions shown do not correspond to true peaks.

d) The Exposure Analysis Summary:

The summary is contained in the left half of this last table of each set as a semi-independent and separate table. It indicates what percent of its total lifetime T the satellite spends in "flux free" regions of space, what percent of T in "high intensity" regions, and while in the latter, what percent of its total daily flux it accumulates.

In the context of this study, the term "flux free" applies to all regions of space where trapped particle fluxes are less than one proton or electron per square centimeter per second, having energies E > .1, E > 5., and E > .5 Mev for the low energy protons, the high energy protons, and the electrons, respectively; by definition, this includes all regions outside the radiation belts. The concept of "trapped particle fluxes" is meant to include stably trapped, pseudo-trapped, and transient fluxes, as long as they are part of or contained in the environment models used and, in the case of transients or pseudos, their sources are considered powerful enough to supply them in a substantial and ever present way.

Similarly, we define as "high intensity" those regions of space where the instantaneous, integral, omnidirectional, trapped-particle flux is greater than 10^3 protons with energies $E > .1$ or $E > 5.$ Mev, and greater than 10^5 electrons with energies $E > .5$ Mev.

The values given in this table are statistical averages, obtained over extended intervals of mission time. However, they may vary significantly from one orbit to the next, when individual orbits are considered.

e) <u>The Time Account Breakdown</u>:

The breakdown of orbit time is given in the right half of the last table of every set, in the same semi-independent form as the summary. The table shows the total lifetime spent by the vehicle in the inner zone T^i $(1.0 < L \leq 2.5)$ and the outer zone T^o $(2.5 < L \leq 7.0)$ of the trapped particle radiation belt, and also the percent duration spent outside that region $(L > 7.0)$, which is denoted by T^e (T-external), such that for any mission

$$T = T^i + T^o + T^e = 100\%.$$

The confinement of the outer zone within the boundary of the $L = 7.0$ volume is arbitrary and has no physical meaning. It is intended only as a simplification to facilitate our calculations. The region considered "external" $(L = 7.0)$ in this study is still partially a domain of the outer zone, at least as far out as $L = 11.0$ earth radii, according to the latest electron models (Singley and Vette, 1972).

A last item on this table: the inner zone time T^i may be subdivided into two parts: the percentage of time spent outside the region $(1.0 < L \leq 1.1)$ and inside the region $(1.1 < L \leq 2.5)$.

APPENDIX C

Description of Plots

a) The Time and Flux Histogram:

This plot shows two curves superimposed on the same graph, namely, one each for the variables "time" and "flux". Both are given as functions of the parameter L (earth radii) within the range 1 - L - 7, on a semi-log scale. The plot depicts: (1) by a plain curve the characteristic trajectory intensities as obtained from the orbital integration process in terms of averaged, instantaneous, integral particle fluxes above a given energy, over constant L-bands of .1 earth radius width, and (2) by a contour marked with symbols the percent of total lifetime (%T) spent in each L-interval. The logarithmic ordinate relates to the time-flux variables. The printed numbers are powers of 10 and pertain to the fluxes; the scale values for the time curve are given in the upper part of the ordinate label: from 10^{-3} to 10^{2} percent of T. The type of particles, their integral energy, and the units, are all given in the lower part of the label. The label on top of the graph lists some useful information about the trajectory.

b) The Spectral Profile:

A graphical presentation of the final spectral distribution, obtained from the orbital integration process. The plot is a semi-log graph, where the abscissa is a linear energy scale for integral particle energies

E_0 in Mev, and the ordinate is a logarithmic scale for the orbit integrated fluxes, given in daily averages for energies greater than E_0; the printed scale values are powers of 10.

c) Peaks per Orbit:

Here the absolute peak intensities, encountered per period, are plotted for the duration of the total flight time considered (1 period = 1 revolution = 1 orbit). The logarithmic ordinate relates to instantaneous particle fluxes of the environment at the indicated energy threshold, while the abscissa is a linear orbit enumeration.

d) World Map Grid Projection of Orbits:

The trajectory is plotted for several revolutions on a global map produced by a Miller Cylindrical Projection. The contours of the continents have been omitted for clarity. The positions of either equatorial crossing, of physical perigee, or of period commencement are indicated by numbers identifying the orbits shown in this graph. For all trajectories, the distance between successive sequential numbers is a measure of the orbit precession.

e) B-L Trace of Orbits:

This plot shows a trace of the trajectory in B-L space on a semi-log scale. Several orbits are usually depicted, each identified by its sequential number. The magnetic equator is entered on all plots. The logarithmic ordinate relates to the field strength B in gauss; the printed values are exponents of 10. L is given in earth radii on the linear abscissa.

TABLE 1

Partial Listing of
Parameters, Constants, Variables, or Expressions
designated as "standard" in the text

1. Standard Tables: set of tables as listed in Figure 2, in the regular format described in Appendix B.

2. Standard Plots: set of plots as listed in Figure 2A, in the regular format described in Appendix C.

3. Standard Production Run: a production run processed on default options.

4. Standard Integration Stepsize: constant time increment of orbit integration: 1'(60").

5. Standard Energies: low energy protons E > .1 Mev, high energy protons E > 5. Mev, and electrons E > .5 Mev.

6. Standard Procedure: established procedure normally followed vs. procedure followed in special cases.

Table 2

** ORBITAL FLUX STUDY WITH COMPOSITE PARTICLE ENVIRONMENTS : VETTES AE4, AE5, AP1, AP5, AP6, AP7 **** PROCEDURE : UNIFLUX OF 1972 **
** ELECTRON FLUXES EXPONENTIALLY DECAYED TO 1972. 0 WITH LIFETIMES: E.G.STASSINOPOULOS&P.VERZARIU ** CUTOFF TIMES: **
** MAGNETIC COORDINATES B AND L COMPUTED BY INVARA OF 1972 WITH ALLMAG, MODEL 4: CAIN&SWEENEY 120-TERM POGO 8/69 * TIME= 1965.0 **
** VEHICLE : ERTS UNIFLUX ** INCLINATION= 81DEG ** PERIGEE= 869KM ** APOGEE= 869KM ** B/L ORBIT TAPE: TD8109 ** PERIOD= 1.705 **

LOW ENERGY PROTONS

** SPECTRAL DISTRIBUTION - NORMALIZED BY FLUX OF ENERGY GREATER THAN .100 MEV **

ENERGY LEVELS >(MEV) — L-BANDS (MAGNETIC SHELL PARAMETER IN EARTH RADII) L-BANDS

ENERGY LEVELS >(MEV)	*1.0-1.2*	*1.2-1.4*	*1.4-1.6*	*1.6-1.8*	*1.8-2.0*	*2.0-2.2*	*2.2-2.4*	*2.4-2.6*	*2.6-2.8*	*2.8-3.0*	*3.0-3.2*	*3.2-3.4*
.100	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00
.500	8.49E-01	8.35E-01	8.35E-01	8.35E-01	8.48E-01	7.39E-01	4.80E-01	4.09E-01	4.18E-01	3.82E-01	3.41E-01	3.16E-01
.900	7.33E-01	7.16E-01	7.19E-01	7.18E-01	7.34E-01	5.83E-01	2.71E-01	2.00E-01	1.91E-01	1.48E-01	1.17E-01	1.01E-01
1.10	6.93E-01	6.86E-01	6.94E-01	6.91E-01	7.01E-01	5.40E-01	2.46E-01	1.71E-01	1.44E-01	9.43E-02	6.87E-02	5.76E-02
1.50	6.22E-01	6.30E-01	6.45E-01	6.41E-01	6.39E-01	4.64E-01	2.03E-01	1.27E-01	8.32E-02	3.83E-02	2.37E-02	1.88E-02
2.00	5.46E-01	5.68E-01	5.90E-01	5.83E-01	5.70E-01	3.85E-01	1.60E-01	8.73E-02	4.28E-02	1.26E-02	6.30E-03	4.62E-03
2.50	4.81E-01	5.13E-01	5.39E-01	5.31E-01	5.09E-01	3.19E-01	1.26E-01	6.03E-02	2.25E-02	4.17E-03	1.67E-03	1.14E-03
3.00	4.24E-01	4.64E-01	4.93E-01	4.84E-01	4.55E-01	2.64E-01	9.97E-02	4.18E-02	1.21E-02	1.40E-03	4.44E-04	2.81E-04
3.50	3.75E-01	4.20E-01	4.52E-01	4.41E-01	4.07E-01	2.19E-01	7.92E-02	2.91E-02	6.61E-03	4.77E-04	1.16E-04	6.93E-05
NORMFLUX=	1.06E 07	1.19E 08	6.33E 07	5.67E 07	5.29E 07	5.84E 07	7.49E 07	1.03E 08	1.32E 08	1.45E 08	1.56E 08	1.24E 08

ENERGY LEVELS >(MEV) — L-BANDS (MAGNETIC SHELL PARAMETER IN EARTH RADII) L-BANDS

ENERGY LEVELS >(MEV)	*3.4-3.6*	*3.6-3.8*	*3.8-4.0*	*4.0-4.2*	*4.2-4.4*	*4.4-4.6*	*4.6-4.8*	*4.8-5.0*	*5.0-5.2*	*5.2-5.4*	*5.4-5.6*	*5.6-5.8*
.100	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00
.500	2.85E-01	2.15E-01	1.07E-01	3.03E-02	9.73E-03	5.85E-03	4.87E-03	4.11E-03	3.59E-03	3.52E-03	3.53E-03	3.49E-03
.900	8.17E-02	4.65E-02	1.23E-02	1.09E-03	1.00E-04	3.43E-05	2.38E-05	1.69E-05	1.28E-05	1.24E-05	1.20E-05	1.22E-05
1.10	4.41E-02	2.17E-02	4.31E-03	2.17E-04	1.01E-05	2.01E-06	3.42E-07	2.67E-07	0.0	0.0	0.0	0.0
1.50	1.29E-02	4.77E-03	5.53E-04	8.24E-06	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.00	2.76E-03	7.23E-04	4.53E-05	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.50	5.95E-04	1.10E-04	3.07E-06	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3.00	1.27E-04	1.58E-05	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3.50	2.60E-05	9.91E-07	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NORMFLUX=	1.25E 08	1.73E 08	1.98E 08	1.73E 08	7.67E 08	7.48E 08	4.05E 08	6.20E 08	5.02E 08	3.59E 08	4.33E 08	2.04E 08

ENERGY LEVELS >(MEV) — L-BANDS (MAGNETIC SHELL PARAMETER IN EARTH RADII) L-BANDS

ENERGY LEVELS >(MEV)	*5.8-6.0*	*6.0-6.2*	*6.2-6.4*	*6.4-6.6*	*6.6-6.8*	*6.8-7.0*	*7.0-7.2*	*7.2-7.4*	*7.4-7.6*	*7.6-7.8*	*7.8-8.0*	*8.0-8.2*
.100	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	0.0	0.0	0.0	0.0	0.0	0.0
.500	3.47E-03	3.47E-03	3.45E-03	3.48E-03	4.18E-03	1.14E-01	0.0	0.0	0.0	0.0	0.0	0.0
.900	1.17E-05	1.15E-05	9.66E-06	9.52E-06	1.36E-05	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.50	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.50	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3.50	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NORMFLUX=	1.86E 08	1.84E 08	1.09E 08	1.39E 08	4.79E 07	9.37E 03	0.0	0.0	0.0	0.0	0.0	0.0

Table 3

** ORBITAL FLUX STUDY WITH COMPOSITE PARTICLE ENVIRONMENTS : VETTES AE4, AE5, AP1, AP5, AP6, AP7 **** PROCEDURE : UNIFLUX OF 1972 **
** ELECTRON FLUXES EXPONENTIALLY DECAYED TO 1972. 0 WITH LIFETIMES: E.G.STASSINOPOULOS&P.VERZARIU ** CUTOFF TIMES: **
** MAGNETIC COORDINATES B AND L COMPUTED BY INVARA OF 1972 WITH ALLMAG, MODEL 4: CAIN&SWEENEY 120-TERM POGO 8/69 * TIME= 1965.0 **
** VEHICLE : ERTS UNIFLUX ** INCLINATION= 81DEG ** PERIGEE= 869KM ** APOGEE= 869KM ** B/L ORBIT TAPE: TD8109 ** PERIOD= 1.705 **

HIGH ENERGY PROTONS

** SPECTRAL DISTRIBUTION - NORMALIZED BY FLUX OF ENERGY GREATER THAN 5.00 MEV **

L - B A N D S (M A G N E T I C S H E L L P A R A M E T E R I N E A R T H R A D I I) L - B A N D S

ENERGY LEVELS >(MEV)	*1.0-1.2*	*1.2-1.4*	*1.4-1.6*	*1.6-1.8*	*1.8-2.0*	*2.0-2.2*	*2.2-2.4*	*2.4-2.6*	*2.6-2.8*	*2.8-3.0*	*3.0-3.2*	*3.2-3.4*
3.00	1.42E 00	1.38E 00	1.41E 00	1.56E 00	1.78E 00	2.20E 00	2.50E 00	3.67E 00	6.50E 00	2.36E 01	1.16E 03	5.80E 02
5.00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	0.0	0.0
10.0	6.97E-01	6.25E-01	5.21E-01	3.48E-01	2.24E-01	1.89E-01	1.60E-01	1.07E-01	7.86E-02	1.89E-02	0.0	0.0
15.0	5.57E-01	4.65E-01	3.49E-01	1.81E-01	8.62E-02	6.62E-02	5.04E-02	2.65E-02	1.58E-02	0.0	0.0	0.0
20.0	5.19E-01	4.16E-01	3.04E-01	1.38E-01	5.65E-02	3.89E-02	2.39E-02	6.51E-03	2.70E-03	0.0	0.0	0.0
25.0	5.02E-01	3.89E-01	2.83E-01	1.16E-01	4.23E-02	2.60E-02	1.30E-02	1.56E-03	0.0	0.0	0.0	0.0
30.0	4.86E-01	3.65E-01	2.63E-01	9.79E-02	3.17E-02	1.75E-02	7.24E-03	2.51E-04	0.0	0.0	0.0	0.0
50.0	4.28E-01	2.83E-01	1.99E-01	4.99E-02	1.02E-02	3.58E-03	7.69E-04	0.0	0.0	0.0	0.0	0.0
100.	3.13E-01	1.83E-01	1.14E-01	2.16E-02	3.08E-03	5.02E-04	0.0	0.0	0.0	0.0	0.0	0.0
NORMFLUX=	3.17E 06	4.00E 07	2.22E 07	1.76E 07	1.35E 07	7.02E 06	2.99E 06	1.17E 06	2.45E 05	8.62E 03	0.0	0.0

L - B A N D S (M A G N E T I C S H E L L P A R A M E T E R I N E A R T H R A D I I) L - B A N D S

ENERGY LEVELS >(MEV)	*3.4-3.6*	*3.6-3.8*	*3.8-4.0*	*4.0-4.2*	*4.2-4.4*	*4.4-4.6*	*4.6-4.8*	*4.8-5.0*	*5.0-5.2*	*5.2-5.4*	*5.4-5.6*	*5.6-5.8*
3.00	2.66E 02	4.54E 01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
50.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
100.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NORMFLUX=	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

L - B A N D S (M A G N E T I C S H E L L P A R A M E T E R I N E A R T H R A D I I) L - B A N D S

ENERGY LEVELS >(MEV)	*5.8-6.0*	*6.0-6.2*	*6.2-6.4*	*6.4-6.6*	*6.6-6.8*	*6.8-7.0*	*7.0-7.2*	*7.2-7.4*	*7.4-7.6*	*7.6-7.8*	*7.8-8.0*	*8.0-8.2*
3.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
50.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
100.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NORMFLUX=	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table 4

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****************************************************************************************************************************
** ORBITAL FLUX STUDY WITH COMPOSITE PARTICLE ENVIRONMENTS : VETTES AE4, AE5, AP1, AP5, AP6, AP7 **** PROCEDURE 1 UNIFLUX OF 1972 **
** ELECTRON FLUXES EXPONENTIALLY DECAYED TO 1972. 0 WITH LIFETIMES: E.G.STASSINOPOULOS&P.VERZARIU ** CUTOFF TIMES:             **
** MAGNETIC COORDINATES B AND L COMPUTED BY INVARA OF 1972 WITH ALLMAG, MODEL  4:  CAIN&SWEENEY 120-TERM POGO 8/69 * TIME= 1965.0 **
** VEHICLE : ERTS UNIFLUX ** INCLINATION= 81DEG ** PERIGEE=  869KM ** APOGEE=   869KM ** B/L ORBIT TAPE: TD8109 ** PERIOD=  1.705 **
****************************************************************************************************************************
                         ****************************          ELECTRONS          ******************************
                         ** SPECTRAL DISTRIBUTION - NORMALIZED BY FLUX OF ENERGY GREATER THAN .500 MEV **
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ENERGY L - B A N D S (M A G N E T I C S H E L L P A R A M E T E R I N E A R T H R A D I I) L - B A N D S

LEVELS >(MEV)	*1.0-1.2*	*1.2-1.4*	*1.4-1.6*	*1.6-1.8*	*1.8-2.0*	*2.0-2.2*	*2.2-2.4*	*2.4-2.6*	*2.6-2.8*	*2.8-3.0*	*3.0-3.2*	*3.2-3.4*
.0	5.39E 00	1.17E 01	2.64E 01	1.17E 02	1.91E 02	3.67E 02	6.61E 02	3.44E 02	6.06E 01	2.03E 01	1.28E 01	1.32E 01
.500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00
1.00	5.28E-01	7.51E-02	1.99E-01	2.04E-01	6.12E-02	4.09E-02	4.45E-02	7.49E-02	1.77E-01	3.40E-01	3.64E-01	3.92E-01
1.50	3.43E-01	2.72E-02	1.05E-01	8.57E-02	1.42E-02	6.34E-03	6.14E-03	1.45E-02	6.34E-02	1.71E-01	1.79E-01	1.94E-01
2.00	1.67E-01	1.36E-02	5.98E-02	3.52E-02	3.95E-03	1.53E-03	1.12E-03	3.03E-03	2.54E-02	8.65E-02	8.76E-02	9.58E-02
2.50	5.34E-02	5.88E-03	2.51E-02	1.22E-02	9.99E-04	3.09E-04	1.09E-04	3.37E-04	6.37E-03	3.94E-02	3.81E-02	4.17E-02
3.00	1.58E-02	2.17E-03	7.77E-03	3.64E-03	2.06E-04	1.68E-05	0.0	0.0	3.40E-04	1.36E-02	1.41E-02	1.52E-02
4.00	1.57E-04	2.18E-05	7.42E-05	7.09E-05	0.0	0.0	0.0	0.0	0.0	4.02E-04	3.94E-04	4.21E-04
5.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NORMFLUX=	3.78E 07	2.50E 09	1.79E 09	2.75E 08	9.00E 07	2.53E 07	7.47E 06	2.67E 06	9.10E 05	1.33E 07	1.24E 08	2.89E 08

ENERGY L - B A N D S (M A G N E T I C S H E L L P A R A M E T E R I N E A R T H R A D I I) L - B A N D S

LEVELS >(MEV)	*3.4-3.6*	*3.6-3.8*	*3.8-4.0*	*4.0-4.2*	*4.2-4.4*	*4.4-4.6*	*4.6-4.8*	*4.8-5.0*	*5.0-5.2*	*5.2-5.4*	*5.4-5.6*	*5.6-5.8*
.0	1.49E 01	1.22E 01	8.28E 00	6.92E 00	6.77E 00	6.71E 00	6.94E 00	7.20E 00	7.40E 00	7.58E 00	7.69E 00	7.63E 00
.500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00
1.00	3.96E-01	3.85E-01	3.63E-01	3.56E-01	3.56E-01	3.63E-01	3.46E-01	3.37E-01	3.31E-01	3.22E-01	3.14E-01	2.80E-01
1.50	1.98E-01	1.92E-01	1.66E-01	1.51E-01	1.42E-01	1.33E-01	1.27E-01	1.21E-01	1.16E-01	1.06E-01	9.96E-02	8.56E-02
2.00	9.91E-02	9.61E-02	7.65E-02	6.38E-02	5.64E-02	4.99E-02	4.66E-02	4.37E-02	4.04E-02	3.52E-02	3.16E-02	2.62E-02
2.50	4.51E-02	4.73E-02	3.72E-02	2.84E-02	2.38E-02	1.98E-02	1.74E-02	1.54E-02	1.34E-02	1.06E-02	8.92E-03	7.15E-03
3.00	1.76E-02	1.99E-02	1.69E-02	1.26E-02	9.49E-03	7.11E-03	5.64E-03	4.48E-03	3.65E-03	2.69E-03	2.18E-03	1.78E-03
4.00	5.25E-04	6.60E-04	5.67E-04	3.92E-04	2.64E-04	1.79E-04	1.37E-04	1.07E-04	8.40E-05	5.75E-05	4.43E-05	2.90E-05
5.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NORMFLUX=	2.89E 08	3.81E 08	5.49E 08	2.78E 08	5.01E 08	3.76E 08	2.22E 08	2.67E 08	1.81E 08	1.41E 08	1.90E 08	8.41E 07

ENERGY L - B A N D S (M A G N E T I C S H E L L P A R A M E T E R I N E A R T H R A D I I) L - B A N D S

LEVELS >(MEV)	*5.8-6.0*	*6.0-6.2*	*6.2-6.4*	*6.4-6.6*	*6.6-6.8*	*6.8-7.0*	*7.0-7.2*	*7.2-7.4*	*7.4-7.6*	*7.6-7.8*	*7.8-8.0*	*8.0-8.2*
.0	7.56E 00	8.07E 00	9.59E 00	1.14E 01	1.36E 01	1.61E 01	2.06E 01	2.80E 01	3.95E 01	6.47E 01	1.17E 02	4.52E 03
.500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00
1.00	2.54E-01	2.40E-01	2.36E-01	2.32E-01	2.06E-01	1.72E-01	1.46E-01	1.30E-01	1.16E-01	1.03E-01	8.99E-02	5.09E-02
1.50	7.54E-02	6.89E-02	6.45E-02	6.06E-02	5.04E-02	3.88E-02	3.12E-02	2.66E-02	2.30E-02	1.95E-02	1.64E-02	4.91E-03
2.00	2.24E-02	1.98E-02	1.76E-02	1.58E-02	1.23E-02	8.78E-03	6.63E-03	5.46E-03	4.67E-03	3.70E-03	2.99E-03	6.32E-04
2.50	6.03E-03	5.16E-03	4.34E-03	3.71E-03	2.77E-03	1.89E-03	1.38E-03	1.10E-03	9.00E-04	6.33E-04	4.24E-04	0.0
3.00	1.53E-03	1.26E-03	9.40E-04	7.33E-04	5.37E-04	3.77E-04	2.76E-04	2.10E-04	1.27E-04	0.0	0.0	0.0
4.00	2.16E-05	6.96E-06	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NORMFLUX=	7.72E 07	7.00E 07	4.98E 07	4.73E 07	3.35E 07	6.94E 06	1.43E 07	1.15E 07	5.18E 06	2.98E 06	1.34E 06	1.14E 06

Table 5

** ORBITAL FLUX STUDY WITH COMPOSITE PARTICLE ENVIRONMENTS : VETTES AE4, AE5, AP1, AP5, AP6, AP7 **** PROCEDURE : UNIFLUX OF 1972 **
** ELECTRON FLUXES EXPONENTIALLY DECAYED TO 1972.0 WITH LIFETIMES: E.G.STASSINOPOULOS&P.VERZARIU ** CUTOFF TIMES: **
** MAGNETIC COORDINATES B AND L COMPUTED BY INVARA OF 1972 WITH ALLMAG, MODEL 4: CAIN&SWEENEY 120-TERM POGO 8/69 * TIME= 1965.0 **
** VEHICLE : ERTS UNIFLUX ** INCLINATION= 81DEG ** PERIGEE= 869KM ** APOGEE= 869KM ** B/L ORBIT TAPE: TD8109 ** PERIOD= 1.705 **

************ LOW ENERGY PROTONS ************

****** SPECTRUM IN PERCENT DELTA ENERGY ******

ENERGY RANGES (MEV)	AVERAGED TOTAL FLUX #/CM**2/SEC	AVERAGED TOTAL FLUX #/CM**2/DAY	SPECTRUM PER CENT
.100-.500	3.338E 04	2.884E 09	89.175
.500-.900	1.788E 03	1.545E 08	4.776
.900-1.10	3.123E 02	2.698E 07	0.834
1.10-1.50	3.730E 02	3.223E 07	0.996
1.50-2.00	2.672E 02	2.309E 07	0.714
2.00-2.50	1.804E 02	1.559E 07	0.482
2.50-3.00	1.392E 02	1.203E 07	0.372
3.00-3.50	1.142E 02	9.869E 06	0.305
3.50-OVER	8.779E 02	7.585E 07	2.345
TOTAL	3.743E 04	3.234E 09	100.000

*** COMPOSITE ORBIT SPECTRUM ***

ENERGY LEVELS >(MEV)	AVERAGED INTEG.FLUX #/CM**2/SEC	AVERAGED INTEG.FLUX #/CM**2/DAY
.100	3.743E 04	3.234E 09
.300	7.803E 03	6.742E 08
.500	4.052E 03	3.501E 08
.700	2.837E 03	2.451E 08
.900	2.264E 03	1.956E 08
1.10	1.952E 03	1.686E 08
1.30	1.737E 03	1.501E 08
1.50	1.579E 03	1.364E 08
1.75	1.429E 03	1.235E 08
2.00	1.312E 03	1.133E 08
2.25	1.215E 03	1.049E 08
2.50	1.131E 03	9.774E 07
2.75	1.058E 03	9.140E 07
3.00	9.921E 02	8.572E 07
3.50	8.779E 02	7.585E 07

* EXPOSURE INDEX-ENERGY >.100MEV *

INTENSITY RANGES #/CM**2/SEC	EXPOSURE DURATION (HOURS)	TOTAL # OF ACCUMULATED PARTICLES
ZERO FLUX	28.133	0.0
1.E0-1.E1	2.100	2.735E 04
1.E1-1.E2	2.167	3.180E 05
1.E2-1.E3	2.017	2.995E 06
1.E3-1.E4	3.150	4.866E 07
1.E4-1.E5	5.450	7.280E 08
1.E5-1.E6	4.783	4.843E 09
1.E6-1.E7	0.200	8.450E 08
1.E7-OVER	0.0	0.0
TOTAL	48.000	6.468E 09

Table 6

****

** ORBITAL FLUX STUDY WITH COMPOSITE PARTICLE ENVIRONMENTS : VETTES AE4, AE5, AP1, AP5, AP6, AP7 **** PROCEDURE : UNIFLUX OF 1972 **

** ELECTRON FLUXES EXPONENTIALLY DECAYED TO 1972. 0 WITH LIFETIMES: E.G.STASSINOPOULOS&P.VERZARIU ** CUTOFF TIMES: **

** MAGNETIC COORDINATES B AND L COMPUTED BY INVARA OF 1972 WITH ALLMAG, MODEL 4: CAIN&SWEENEY 120-TERM POGO 8/69 * TIME= 1965.0 **

** VEHICLE : ERTS UNIFLUX ** INCLINATION= 81DEG ** PERIGEE= 869KM ** APOGEE= 869KM ** B/L ORBIT TAPE: TD8109 ** PERIOD= 1.705 **

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************ HIGH ENERGY PROTONS ************

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****** SPECTRUM IN PERCENT DELTA ENERGY ******

ENERGY RANGES (MEV)	AVERAGED TOTAL FLUX #/CM**2/SEC	AVERAGED TOTAL FLUX #/CM**2/DAY	SPECTRUM PER CENT
3.00-5.00	3.679E 02	3.179E 07	37.088
5.00-10.0	3.356E 02	2.900E 07	33.829
10.0-15.0	9.699E 01	8.380E 06	9.776
15.0-20.0	2.623E 01	2.267E 06	2.644
20.0-25.0	1.323E 01	1.143E 06	1.333
25.0-30.0	1.163E 01	1.004E 06	1.172
30.0-50.0	3.564E 01	3.079E 06	3.592
50.0-100.	3.961E 01	3.422E 06	3.993
100.-OVER	6.521E 01	5.634E 06	6.573
TOTAL	9.921E 02	8.572E 07	100.000

*** COMPOSITE ORBIT SPECTRUM ***

ENERGY LEVELS >(MEV)	AVERAGED INTEG.FLUX #/CM**2/SEC	AVERAGED INTEG.FLUX #/CM**2/DAY
3.00	9.921E 02	8.572E 07
4.00	7.813E 02	6.750E 07
5.00	6.241E 02	5.393E 07
7.00	4.153E 02	3.588E 07
10.0	2.885E 02	2.493E 07
12.0	2.435E 02	2.104E 07
15.0	1.915E 02	1.655E 07
18.0	1.712E 02	1.479E 07
20.0	1.653E 02	1.428E 07
25.0	1.521E 02	1.314E 07
30.0	1.405E 02	1.214E 07
50.0	1.048E 02	9.056E 06
60.0	9.509E 01	8.215E 06
70.0	8.641E 01	7.466E 06
100.	6.521E 01	5.634E 06

* EXPOSURE INDEX-ENERGY >5.00MEV *

INTENSITY RANGES #/CM**2/SEC	EXPOSURE DURATION (HOURS)	TOTAL # OF ACCUMULATED PARTICLES
ZERO FLUX	37.450	0.0
1.E0-1.E1	2.267	3.172E 04
1.E1-1.E2	1.783	2.368E 05
1.E2-1.E3	2.100	3.273E 06
1.E3-1.E4	3.367	5.460E 07
1.E4-1.E5	1.033	4.972E 07
1.E5-1.E6	0.0	0.0
1.E6-1.E7	0.0	0.0
1.E7-OVER	0.0	0.0
TOTAL	48.000	1.079E 08

Table 7

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*************************************************************************************************************************
** ORBITAL FLUX STUDY WITH COMPOSITE PARTICLE ENVIRONMENTS : VETTES AE4, AE5, AP1, AP5, AP6, AP7 **** PROCEDURE : UNIFLUX OF 1972 **
** ELECTRON FLUXES EXPONENTIALLY DECAYED TO 1972. 0 WITH LIFETIMES: E.G.STASSINOPOULOS&P.VERZARIU ** CUTOFF TIMES:           **
** MAGNETIC COORDINATES B AND L COMPUTED BY INVARA OF 1972 WITH ALLMAG, MODEL  4:  CAIN&SWEENEY 120-TERM POGO 8/69 * TIME= 1965.0 **
** VEHICLE : ERTS UNIFLUX ** INCLINATION= 81DEG ** PERIGEE=  869KM ** APOGEE=   869KM ** B/L ORBIT TAPE: TD8109 ** PERIOD=  1.705 **
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************ ELECTRONS ************

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****** SPECTRUM IN PERCENT DELTA ENERGY ******

ENERGY RANGES (MEV)	AVERAGED TOTAL FLUX #/CM**2/SEC	AVERAGED TOTAL FLUX #/CM**2/DAY	SPECTRUM PER CENT
.0 -.500	1.010E 06	8.727E 10	95.129
.500-1.00	3.964E 04	3.425E 09	3.733
1.00-1.50	6.860E 03	5.927E 08	0.646
1.50-2.00	2.803E 03	2.422E 08	0.264
2.00-2.50	1.391E 03	1.202E 08	0.131
2.50-3.00	6.489E 02	5.607E 07	0.061
3.00-4.00	3.645E 02	3.149E 07	0.034
4.00-5.00	8.718E 00	7.532E 05	0.001
5.00-OVER	0.0	0.0	0.0
TOTAL	1.062E 06	9.173E 10	100.000

*** COMPOSITE ORBIT SPECTRUM ***

ENERGY LEVELS >(MEV)	AVERAGED INTEG.FLUX #/CM**2/SEC	AVERAGED INTEG.FLUX #/CM**2/DAY
.0	1.062E 06	9.173E 10
.250	1.719E 05	1.485E 10
.500	5.171E 04	4.468E 09
.750	2.193E 04	1.895E 09
1.00	1.208E 04	1.043E 09
1.25	7.944E 03	6.864E 08
1.50	5.216E 03	4.507E 08
1.75	3.594E 03	3.106E 08
2.00	2.413E 03	2.085E 08
2.50	1.022E 03	8.831E 07
3.00	3.732E 02	3.225E 07
3.50	8.114E 01	7.011E 06
4.00	8.718E 00	7.532E 05
4.50	1.832E-01	1.583E 04
5.00	0.0	0.0

* EXPOSURE INDEX-ENERGY >.500MEV *

INTENSITY RANGES #/CM**2/SEC	EXPOSURE DURATION (HOURS)	TOTAL # OF ACCUMULATED PARTICLES
ZERO FLUX	27.483	0.0
1.E0-1.E1	1.233	2.139E 04
1.E1-1.E2	1.367	1.875E 05
1.E2-1.E3	1.617	2.459E 06
1.E3-1.E4	2.883	4.676E 07
1.E4-1.E5	6.267	1.062E 09
1.E5-1.E6	6.683	5.232E 09
1.E6-1.E7	0.467	2.593E 09
1.E7-OVER	0.0	0.0
TOTAL	48.000	8.936E 09

Table 8

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*********************************************************************************************************************************
** ORBITAL FLUX STUDY WITH COMPOSITE PARTICLE ENVIRONMENTS : VETTES AE4, AE5, AP1, AP5, AP6, AP7 **** PROCEDURE : UNIFLUX OF 1972 **
** ELECTRON FLUXES EXPONENTIALLY DECAYED TO 1972. 0 WITH LIFETIMES: E.G.STASSINOPOULOS&P.VERZARIU ** CUTOFF TIMES:              **
** MAGNETIC COORDINATES B AND L COMPUTED BY INVARA OF 1972 WITH ALLMAG, MODEL  4:  CAIN&SWEENEY 120-TERM POGO 8/69 * TIME= 1965.0 **
** VEHICLE : ERTS UNIFLUX ** INCLINATION= 81DEG ** PERIGEE=  869KM ** APOGEE=   869KM ** B/L ORBIT TAPE: TD8109 ** PERIOD=  1.705 **
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******************** LOW ENERGY PROTONS ********************

** TABLE OF PEAK AND TOTAL FLUXES PER PERIOD - ENERGY >.100 MEV **

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PERIOD NUMBER	PEAK FLUX ENCOUNTERED #/CM**2/SEC	POSITION AT WHICH ENCOUNTERED LONGITUDE (DEG)	LATITUDE (DEG)	ALTITUDE (KM)	ORBIT TIME (HOURS)	FIELD(B) (GAUSS)	LINE(L) (E.R.)	TOTAL FLUX PER ORBIT #/CM**2/ORBIT
1	4.034E 05	74.413	-51.51	874.71	1.10000	0.35609	4.82	9.903E 07
2	9.043E 05	49.652	-54.06	875.61	2.81667	0.30066	4.23	2.228E 08
3	1.329E 06	26.788	-59.95	877.62	4.55000	0.28256	4.25	3.253E 08
4	1.006E 06	5.330	-65.74	879.43	6.28333	0.28758	4.21	3.044E 08
5	1.021E 06	-13.487	-71.29	880.97	8.01667	0.30744	4.46	2.372E 08
6	7.407E 05	-34.827	-73.55	881.54	9.73333	0.32096	4.36	1.778E 08
7	6.234E 05	-54.816	-75.67	882.04	11.45000	0.33971	4.65	1.740E 08
8	1.094E 06	44.672	-55.27	879.75	13.36667	0.29378	4.24	3.293E 08
9	1.243E 06	12.056	-66.08	882.11	15.01667	0.29277	4.57	4.944E 08
10	9.531E 05	-23.651	-73.13	883.15	16.68330	0.31635	4.53	3.358E 08
11	5.577E 05	-59.353	-76.63	883.47	18.36664	0.34621	4.92	2.053E 08
12	5.251E 05	-12.003	59.42	880.59	19.03331	0.35075	4.61	1.509E 08
13	4.848E 05	-39.766	55.21	879.60	20.71666	0.36237	5.08	1.090E 08
14	2.917E 05	-121.151	-70.08	882.84	23.51666	0.38655	4.71	8.082E 07
15	3.926E 05	73.992	-49.77	874.00	24.95000	0.35183	4.37	1.076E 08
16	1.076E 06	50.497	-55.72	876.15	26.68330	0.30709	4.59	2.060E 08
17	1.267E 06	27.951	-61.59	878.15	28.41664	0.28980	4.58	3.085E 08
18	1.238E 06	7.065	-67.32	879.94	30.14999	0.29533	4.55	2.931E 08
19	8.676E 05	-10.610	-72.78	881.43	31.88332	0.31488	4.89	2.279E 08
20	7.562E 05	-31.118	-74.96	881.97	33.59999	0.32678	4.79	1.597E 08
21	5.934E 05	-49.938	-76.96	882.45	35.31667	0.34286	5.07	1.892E 08
22	1.244E 06	44.044	-56.99	880.48	37.21666	0.29778	4.53	3.328E 08
23	1.454E 06	13.630	-64.49	882.10	38.88332	0.28723	4.37	4.946E 08
24	1.106E 06	-20.666	-71.65	883.23	40.54999	0.30886	4.30	3.495E 08
25	6.503E 05	-54.714	-75.31	883.61	42.23331	0.33785	4.55	2.181E 08
26	5.168E 05	-10.885	61.05	880.93	42.89999	0.35359	5.05	1.473E 08
27	4.573E 05	-40.319	53.48	879.20	44.56667	0.35980	4.61	1.001E 08
28	2.517E 05	-67.480	49.22	878.12	46.25000	0.38491	4.88	7.392E 07

Table 9

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** ORBITAL FLUX STUDY WITH COMPOSITE PARTICLE ENVIRONMENTS : VETTES AE4, AE5, AP1, AP5, AP6, AP7 **** PROCEDURE : UNIFLUX OF 1972 **
** ELECTRON FLUXES EXPONENTIALLY DECAYED TO 1972. 0 WITH LIFETIMES: E.G.STASSINOPOULOS&P.VERZARIU ** CUTOFF TIMES: **
** MAGNETIC COORDINATES B AND L COMPUTED BY INVARA OF 1972 WITH ALLMAG, MODEL 4: CAIN&SWEENEY 120-TERM POGO 8/69 * TIME= 1965.0 **
** VEHICLE : ERTS UNIFLUX ** INCLINATION= 81DEG ** PERIGEE= 869KM ** APOGEE= 869KM ** B/L ORBIT TAPE: TD8109 ** PERIOD= 1.705 **
****

******************** HIGH ENERGY PROTONS ********************

** TABLE OF PEAK AND TOTAL FLUXES PER PERIOD - ENERGY >5.00 MEV **

****

PERIOD NUMBER	PEAK FLUX ENCOUNTERED #/CM**2/SEC	POSITION AT WHICH ENCOUNTERED LONGITUDE (DEG)	LATITUDE (DEG)	ALTITUDE (KM)	ORBIT TIME (HOURS)	FIELD(B) (GAUSS)	LINE(L) (E.R.)	TOTAL FLUX PER ORBIT #/CM**2/ORBIT
1	1.657E 01	-100.499	0.0	868.58	0.0	0.22273	1.16	4.423E 03
2	2.833E 03	44.639	-33.44	868.32	2.71667	0.24764	2.05	7.262E 05
3	9.127E 03	18.701	-32.58	868.03	4.41667	0.22041	1.91	2.692E 06
4	1.468E 04	-5.978	-38.62	870.06	6.15000	0.20855	1.89	6.617E 06
5	1.622E 04	-33.862	-23.90	865.44	7.78333	0.17673	1.31	1.013E 07
6	1.173E 04	-58.789	-29.97	867.16	9.51667	0.18098	1.29	6.013E 06
7	1.211E 03	-85.470	-22.16	864.96	11.18333	0.19989	1.20	5.194E 05
8	1.456E 03	50.081	-34.71	874.17	13.46667	0.25955	2.14	3.375E 05
9	7.649E 03	24.782	-32.12	873.51	15.18333	0.22390	1.93	2.199E 06
10	1.376E 04	-1.618	-36.44	874.69	16.86664	0.20888	1.87	5.731E 06
11	1.570E 04	-25.910	-26.93	872.29	18.61664	0.18294	1.40	1.008E 07
12	1.526E 04	-51.725	-27.80	872.52	20.31667	0.17577	1.29	7.756E 06
13	2.991E 03	-76.698	-21.74	871.21	22.04999	0.18975	1.20	1.217E 06
14	1.151E 02	-102.119	-19.14	870.74	23.76666	0.21370	1.18	3.699E 04
15	1.368E 01	-126.895	-9.60	869.42	25.51666	0.22067	1.14	3.548E 03
16	2.707E 03	44.421	-31.68	867.57	26.56667	0.24557	1.95	6.829E 05
17	8.122E 03	18.591	-30.81	867.28	28.26666	0.21972	1.84	2.696E 06
18	1.422E 04	-6.150	-36.86	869.29	30.00000	0.20656	1.83	6.550E 06
19	1.633E 04	-33.059	-29.07	866.71	31.66664	0.18067	1.39	1.011E 07
20	1.133E 04	-58.395	-31.67	867.52	33.38332	0.18292	1.32	6.050E 06
21	1.145E 03	-84.225	-30.80	867.22	35.08331	0.21034	1.29	5.263E 05
22	1.486E 03	50.499	-33.02	874.08	37.33331	0.25809	2.04	3.360E 05
23	7.236E 03	24.660	-33.88	874.33	39.03331	0.22470	2.00	2.218E 06
24	1.344E 04	-1.183	-34.75	874.59	40.73331	0.20776	1.82	5.624E 06
25	1.546E 04	-26.482	-32.16	873.94	42.45000	0.18712	1.49	1.003E 07
26	1.599E 04	-51.813	-29.57	873.31	44.16664	0.17740	1.31	7.747E 06
27	2.821E 03	-76.750	-23.51	871.94	45.89999	0.19071	1.21	1.191E 06
28	1.243E 02	-101.794	-17.45	870.80	47.63332	0.21148	1.17	3.684E 04

Table 10

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** ORBITAL FLUX STUDY WITH COMPOSITE PARTICLE ENVIRONMENTS : VETTES AE4, AE5, AP1, AP5, AP6, AP7 **** PROCEDURE : UNIFLUX OF 1972 **
** ELECTRON FLUXES EXPONENTIALLY DECAYED TO 1972. 0 WITH LIFETIMES: E.G.STASSINOPOULOS&P.VERZARIU ** CUTOFF TIMES: **
** MAGNETIC COORDINATES B AND L COMPUTED BY INVARA OF 1972 WITH ALLMAG, MODEL 4: CAIN&SWEENEY 120-TERM POGO 8/69 * TIME= 1965.0 **
** VEHICLE : ERTS UNIFLUX ** INCLINATION= 81DEG ** PERIGEE= 869KM ** APOGEE= 869KM ** B/L ORBIT TAPE: TD8109 ** PERIOD= 1.705 **
****

******************** ELECTRONS ********************
** TABLE OF PEAK AND TOTAL FLUXES PER PERIOD - ENERGY >.500 MEV **
****

PERIOD NUMBER	PEAK FLUX ENCOUNTERED #/CM**2/SEC	POSITION AT WHICH ENCOUNTERED LONGITUDE (DEG)	LATITUDE (DEG)	ALTITUDE (KM)	ORBIT TIME (HOURS)	FIELD(B) (GAUSS)	LINE(L) (E.R.)	TOTAL FLUX PER ORBIT #/CM**2/ORBIT
1	2.584E 05	73.338	-48.09	873.48	1.08333	0.34692	3.98	1.211E 08
2	3.378E 05	49.652	-54.06	875.61	2.81667	0.30066	4.23	1.500E 08
3	3.770E 05	26.788	-59.95	877.62	4.55000	0.28256	4.25	2.029E 08
4	9.938E 05	-8.456	-21.30	864.80	6.06667	0.19522	1.43	3.735E 08
5	2.187E 06	-33.434	-27.37	866.40	7.80000	0.17907	1.36	6.860E 08
6	1.390E 06	-57.702	-36.89	869.43	9.55000	0.19147	1.40	4.288E 08
7	2.661E 05	-62.119	-72.80	881.37	11.43333	0.33217	3.94	1.552E 08
8	3.523E 05	44.672	-55.27	879.75	13.36667	0.29378	4.24	1.944E 08
9	3.813E 05	14.779	-62.81	881.49	15.03333	0.28143	4.16	2.653E 08
10	6.325E 05	0.696	-19.13	870.64	16.95000	0.20270	1.43	3.399E 08
11	2.272E 06	-25.910	-26.93	872.29	18.61664	0.18294	1.40	6.985E 08
12	1.696E 06	-52.735	-34.72	874.27	20.28331	0.18469	1.38	5.720E 08
13	2.352E 05	-41.076	51.82	878.74	20.70000	0.35743	4.24	1.424E 08
14	2.032E 05	-68.116	47.55	877.61	22.38332	0.38285	4.45	1.121E 08
15	2.437E 05	73.992	-49.77	874.00	24.95000	0.35183	4.37	1.182E 08
16	3.191E 05	49.147	-52.32	874.93	26.66664	0.29484	3.92	1.490E 08
17	3.828E 05	26.000	-58.25	877.03	28.39999	0.27570	3.96	2.077E 08
18	1.075E 06	-8.498	-19.53	864.15	29.91664	0.19464	1.40	3.787E 08
19	2.440E 06	-33.059	-29.07	866.71	31.66664	0.18067	1.39	7.039E 08
20	1.206E 06	-57.854	-35.13	868.67	33.39999	0.18815	1.37	4.218E 08
21	2.699E 05	-58.720	-74.24	881.81	35.29999	0.33592	4.27	1.562E 08
22	3.704E 05	45.497	-53.61	879.65	37.23331	0.29050	4.00	1.956E 08
23	3.911E 05	16.032	-61.18	881.44	38.89999	0.27617	3.98	2.752E 08
24	6.568E 05	1.021	-17.43	870.70	40.81667	0.20254	1.40	3.459E 08
25	2.083E 06	-25.549	-25.24	872.26	42.48331	0.18208	1.38	6.775E 08
26	1.729E 06	-52.317	-33.03	874.19	44.14999	0.18186	1.35	5.835E 08
27	2.366E 05	-96.513	-70.89	883.19	45.66664	0.35921	3.98	1.463E 08
28	2.092E 05	-68.438	45.79	877.22	46.23331	0.37994	4.06	1.086E 08

TABLE –   TABLE 11

ERTS UNIFLUX   ERTS UNIFLUX

CIRCULAR   CIRCULAR

INCLINATION: 81 DEG   INCLINATION: 81 DEG

PERIGEE: 869 KM   PERIGEE: 869 KM

APOGEE: 869 KM   APOGEE: 869 KM

DECAY DATE: 1972. 0.   DECAY DATE: 1972. 0.

**** EXPOSURE ANALYSIS ****

	PROTONS-LOW (E>.100MEV)	PROTONS-HIGH (E>5.00MEV)	ELECTRONS (E>.500MEV)
PERCENT OF TOTAL LIFE-TIME SPENT IN FLUX-FREE REGIONS* OF SPACE :	58.61 %	78.02 %	57.26 %
PERCENT OF TOTAL LIFE-TIME SPENT IN HIGH-INTENSITY REGIONS+ OF VAN ALLEN BELTS :	28.30 %	9.17 %	14.90 %
PERCENT OF TOTAL DAILY FLUX ACCUMULATED IN HIGH-INTENSITY REGIONS:	99.95 %	96.72 %	87.56 %

****

* <1 PARTICLE/CM**2/SEC

\+ >1.E5 EL/CM**2/SEC OR 1.E3 PR/CM**2/SEC

* PERCENT OF TOTAL LIFETIME SPENT INSIDE AND *
* OUTSIDE THE TRAPPED-PARTICLE RADIATION BELT *

INNER ZONE (1.0 < L < 2.5)	-TI-*	:	53.99 %
OUTER ZONE (2.5 < L < 7.0)	-TO-	:	23.89 %
EXTERNAL (L > 7.0)	-TE-	:	22.12 %
TOTAL		:	100.00 %

*TIME IN INNER ZONE MAY BE SUBDIVIDED AS FOLLOWS:

OUTSIDE TRAPPING REGION (1.0 < L < 1.1)	:	2.88 %
INSIDE TRAPPING REGION (1.1 < L < 2.5)	:	51.11 %

Table 12

** ORBITAL FLUX STUDY WITH COMPOSITE PARTICLE ENVIRONMENTS : VETTES AE4, AE5, AP1, AP5, AP6, AP7 **** PROCEDURE : UNIFLUX OF 1972 **
** ELECTRON FLUXES EXPONENTIALLY DECAYED TO 1972. 0 WITH LIFETIMES: E.G.STASSINOPOULO S&P, VERZARIU ** CUTOFF TIMES: **
** MAGNETIC COORDINATES B AND L COMPUTED BY INVARA OF 1972 WITH ALLMAG, MODEL 4: CAIN&SWEENEY 120-TERM POGO 8/69 * TIME= 1965.0 **
** VEHICLE : NIMBUS UNFLX ** INCLINATION= 80DEG ** PERIGEE= 1111KM ** APOGEE= 1111KM ** B/L ORBIT TAPE: TDC109 ** PERIOD= 1.792 **

LOW ENERGY PROTONS

** SPECTRAL DISTRIBUTION - NORMALIZED BY FLUX OF ENERGY GREATER THAN .100 MEV **

ENERGY LEVELS >(MEV)	L - BANDS (MAGNETIC SHELL PARAMETER IN EARTH RADII) L - BANDS											
	1.0-1.2	*1.2-1.4*	*1.4-1.6*	*1.6-1.8*	*1.8-2.0*	*2.0-2.2*	*2.2-2.4*	*2.4-2.6*	*2.6-2.8*	*2.8-3.0*	*3.0-3.2*	*3.2-3.4*
.100	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00
.500	8.50E-01	8.35E-01	8.35E-01	8.34E-01	8.46E-01	7.76E-01	4.99E-01	4.08E-01	4.09E-01	3.82E-01	3.37E-01	3.16E-01
.900	7.33E-01	7.20E-01	7.20E-01	7.20E-01	7.35E-01	6.27E-01	2.90E-01	1.97E-01	1.80E-01	1.48E-01	1.14E-01	1.00E-01
1.10	6.92E-01	6.95E-01	6.96E-01	6.95E-01	7.07E-01	5.81E-01	2.61E-01	1.67E-01	1.31E-01	9.39E-02	6.70E-02	5.70E-02
1.50	6.20E-01	6.49E-01	6.51E-01	6.49E-01	6.56E-01	4.98E-01	2.13E-01	1.21E-01	7.06E-02	3.80E-02	2.31E-02	1.84E-02
2.00	5.42E-01	5.97E-01	6.00E-01	5.97E-01	5.97E-01	4.12E-01	1.65E-01	6.10E-02	3.34E-02	1.24E-02	6.12E-03	4.51E-03
2.50	4.75E-01	5.51E-01	5.53E-01	5.50E-01	5.45E-01	3.41E-01	1.28E-01	5.48E-02	1.62E-02	4.11E-03	1.62E-03	1.11E-03
3.00	4.17E-01	5.08E-01	5.10E-01	5.07E-01	4.98E-01	2.82E-01	9.97E-02	3.72E-02	8.09E-03	1.38E-03	4.30E-04	2.72E-04
3.50	3.67E-01	4.70E-01	4.70E-01	4.68E-01	4.56E-01	2.33E-01	7.78E-02	2.53E-02	4.12E-03	4.68E-04	1.14E-04	6.69E-05
NORMFLUX=	1.59E 07	3.60E 08	1.79E 08	1.31E 08	1.06E 08	9.93E 07	1.74E 08	2.19E 08	2.79E 08	2.26E 08	3.71E 08	2.60E 08

ENERGY LEVELS >(MEV)	L - BANDS (MAGNETIC SHELL PARAMETER IN EARTH RADII) L - BANDS											
	3.4-3.6	*3.6-3.8*	*3.8-4.0*	*4.0-4.2*	*4.2-4.4*	*4.4-4.6*	*4.6-4.8*	*4.8-5.0*	*5.0-5.2*	*5.2-5.4*	*5.4-5.6*	*5.6-5.8*
.100	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00
.500	2.83E-01	2.14E-01	1.33E-01	2.78E-02	8.73E-03	6.09E-03	5.16E-03	4.00E-03	3.54E-03	3.55E-03	3.54E-03	3.59E-03
.900	8.04E-02	4.61E-02	1.90E-02	9.49E-04	8.30E-05	3.73E-05	2.68E-05	1.61E-05	1.26E-05	1.26E-05	1.26E-05	1.29E-05
1.10	4.31E-02	2.14E-02	7.31E-03	1.90E-04	8.39E-06	2.82E-06	1.44E-06	3.75E-07	0.0	0.0	0.0	0.0
1.50	1.24E-02	4.64E-03	1.12E-03	8.25E-06	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.00	2.64E-03	6.90E-04	1.11E-04	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.50	5.63E-04	1.03E-04	1.04E-05	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3.00	1.20E-04	1.39E-05	6.00E-07	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3.50	2.50E-05	1.03E-06	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NORMFLUX=	3.32E 08	3.13E 08	4.62E 08	7.26E 08	9.35E 08	1.33E 09	1.38E 09	1.07E 09	6.27E 08	6.07E 08	6.24E 08	4.31E 08

ENERGY LEVELS >(MEV)	L - BANDS (MAGNETIC SHELL PARAMETER IN EARTH RADII) L - BANDS											
	5.8-6.0	*6.0-6.2*	*6.2-6.4*	*6.4-6.6*	*6.6-6.8*	*6.8-7.0*	*7.0-7.2*	*7.2-7.4*	*7.4-7.6*	*7.6-7.8*	*7.8-8.0*	*8.0-8.2*
.100	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	0.0	0.0	0.0	0.0	0.0
.500	3.53E-03	3.43E-03	3.53E-03	3.51E-03	3.94E-03	5.59E-03	1.83E-02	0.0	0.0	0.0	0.0	0.0
.900	1.25E-05	1.18E-05	1.25E-05	1.23E-05	1.44E-05	1.06E-05	0.0	0.0	0.0	0.0	0.0	0.0
1.10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.50	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.50	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3.50	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NORMFLUX=	3.14E 08	3.78E 08	1.90E 08	2.39E 08	8.12E 07	9.13E 06	2.51E 05	0.0	0.0	0.0	0.0	0.0

Table 13

** ORBITAL FLUX STUDY WITH COMPOSITE PARTICLE ENVIRONMENTS : VETTES AE4, AE5, AP1, AP5, AP6, AP7 **** PROCEDURE : UNIFLUX OF 1972 **
** ELECTRON FLUXES EXPONENTIALLY DECAYED TO 1972. 0 WITH LIFETIMES: E.G.STASSINOPOULOS&P.VERZARIU ** CUTOFF TIMES: **
** MAGNETIC COORDINATES B AND L COMPUTED BY INVARA OF 1972 WITH ALLMAG. MODEL 4: CAIN&SWEENEY 120-TERM POGO 8/69 * TIME= 1965.0 **
** VEHICLE : NIMBUS UNFLX ** INCLINATION= 80DEG ** PERIGEE= 1111KM ** APOGEE= 1111KM ** B/L ORBIT TAPE: TD8109 ** PERIOD= 1.792 **

HIGH ENERGY PROTONS

** SPECTRAL DISTRIBUTION - NORMALIZED BY FLUX OF ENERGY GREATER THAN 5.00 MEV **

ENERGY LEVELS >(MEV)	L-BANDS (MAGNETIC SHELL PARAMETER IN EARTH RADII) *1.0-1.2*	*1.2-1.4*	*1.4-1.6*	*1.6-1.8*	*1.8-2.0*	*2.0-2.2*	*2.2-2.4*	*2.4-2.6*	*2.6-2.8*	*2.8-3.0*	*3.0-3.2*	L-BANDS *3.2-3.4*
3.00	1.43E 00	1.34E 00	1.41E 00	1.55E 00	1.73E 00	2.20E 00	2.58E 00	3.85E 00	7.60E 00	2.22E 01	1.84E 03	1.18E 03
5.00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	0.0
10.0	7.04E-01	5.85E-01	4.82E-01	3.17E-01	2.09E-01	1.90E-01	1.66E-01	1.04E-01	7.54E-02	1.63E-02	0.0	0.0
15.0	5.66E-01	4.18E-01	3.08E-01	1.58E-01	7.86E-02	6.60E-02	5.37E-02	2.51E-02	1.44E-02	0.0	0.0	0.0
20.0	5.29E-01	3.65E-01	2.64E-01	1.19E-01	5.09E-02	3.84E-02	2.73E-02	6.89E-03	2.59E-03	0.0	0.0	0.0
25.0	5.13E-01	3.35E-01	2.44E-01	9.92E-02	3.79E-02	2.66E-02	1.58E-02	2.19E-03	2.38E-04	0.0	0.0	0.0
30.0	4.97E-01	3.08E-01	2.26E-01	8.30E-02	2.82E-02	1.69E-02	9.25E-03	6.84E-04	0.0	0.0	0.0	0.0
50.0	4.40E-01	2.21E-01	1.66E-01	4.11E-02	8.77E-03	3.36E-03	1.13E-03	5.86E-05	0.0	0.0	0.0	0.0
100.	3.18E-01	1.44E-01	9.74E-02	1.95E-02	3.02E-03	6.26E-04	3.84E-05	0.0	0.0	0.0	0.0	0.0
NORMFLUX=	4.64E 06	1.37E 08	6.48E 07	4.27E 07	3.05E 07	1.27E 07	6.71E 06	2.11E 06	2.97E 05	1.40E 04	8.67E 01	0.0

ENERGY LEVELS >(MEV)	L-BANDS (MAGNETIC SHELL PARAMETER IN EARTH RADII) *3.4-3.6*	*3.6-3.8*	*3.8-4.0*	*4.0-4.2*	*4.2-4.4*	*4.4-4.6*	*4.6-4.8*	*4.8-5.0*	*5.0-5.2*	*5.2-5.4*	*5.4-5.6*	L-BANDS *5.6-5.8*
3.00	6.66E 02	7.28E 01	4.62E 00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
50.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
100.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NORMFLUX=	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

ENERGY LEVELS >(MEV)	L-BANDS (MAGNETIC SHELL PARAMETER IN EARTH RADII) *5.8-6.0*	*6.0-6.2*	*6.2-6.4*	*6.4-6.6*	*6.6-6.8*	*6.8-7.0*	*7.0-7.2*	*7.2-7.4*	*7.4-7.6*	*7.6-7.8*	*7.8-8.0*	L-BANDS *8.0-8.2*
3.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
50.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
100.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NORMFLUX=	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table 14

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*****************************************************************************************************************************
** ORBITAL FLUX STUDY WITH COMPOSITE PARTICLE ENVIRONMENTS : VETTES AE4, AE5, AP1, AP5, AP6, AP7 **** PROCEDURE : UNIFLUX OF 1972 **
** ELECTRON FLUXES EXPONENTIALLY DECAYED TO 1972. 0 WITH LIFETIMES: E.G.STASSINOPOULOS&P.VERZARIU ** CUTOFF TIMES:              **
** MAGNETIC COORDINATES B AND L COMPUTED BY INVARA OF 1972 WITH ALLMAG, MODEL   4:  CAIN&SWEENEY 120-TERM POGO 8/69 * TIME= 1965.0 **
** VEHICLE : NIMBUS UNFLX ** INCLINATION= 80DEG ** PERIGEE= 1111KM ** APOGEE=  1111KM ** B/L ORBIT TAPE: TD6109 ** PERIOD= 1.792 **
*****************************************************************************************************************************
                    **************************** ELECTRONS ****************************
                ** SPECTRAL DISTRIBUTION - NORMALIZED BY FLUX OF ENERGY GREATER THAN .500 MEV **
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ENERGY LEVELS >(MEV)	L-BANDS (MAGNETIC SHELL PARAMETER IN EARTH RADII) L-BANDS *1.0-1.2*	*1.2-1.4*	*1.4-1.6*	*1.6-1.8*	*1.8-2.0*	*2.0-2.2*	*2.2-2.4*	*2.4-2.6*	*2.6-2.8*	*2.8-3.0*	*3.0-3.2*	*3.2-3.4*
.0	5.35E 00	1.10E 01	2.18E 01	1.08E 02	1.76E 02	3.38E 02	6.04E 02	2.27E 02	5.98E 01	2.22E 01	1.27E 01	1.35E 01
.500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00
1.00	5.30E-01	7.58E-02	1.88E-01	2.06E-01	6.37E-02	4.07E-02	4.33E-02	8.31E-02	2.09E-01	3.42E-01	3.65E-01	3.92E-01
1.50	3.45E-01	2.78E-02	9.76E-02	8.72E-02	1.51E-02	6.30E-03	5.90E-03	1.71E-02	6.35E-02	1.76E-01	1.79E-01	1.94E-01
2.00	1.69E-01	1.34E-02	5.53E-02	3.59E-02	4.26E-03	1.51E-03	1.08E-03	3.77E-03	3.72E-02	9.02E-02	8.76E-02	9.62E-02
2.50	5.47E-02	5.50E-03	2.36E-02	1.25E-02	1.12E-03	2.99E-04	1.44E-04	4.96E-04	1.06E-02	4.05E-02	3.80E-02	4.20E-02
3.00	1.64E-02	1.88E-03	7.62E-03	3.72E-03	2.46E-04	1.94E-05	0.0	0.0	1.08E-03	1.28E-02	1.41E-02	1.53E-02
4.00	1.65E-04	1.77E-05	6.94E-05	7.28E-05	1.33E-06	0.0	0.0	0.0	0.0	4.03E-04	3.92E-04	4.22E-04
5.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NORMFLUX=	5.18E 07	1.11E 10	5.37E 09	6.07E 08	1.88E 08	4.67E 07	1.79E 07	4.91E 06	1.72E 06	9.51E 06	1.87E 08	3.96E 08

ENERGY LEVELS >(MEV)	L-BANDS (MAGNETIC SHELL PARAMETER IN EARTH RADII) L-BANDS *3.4-3.6*	*3.6-3.8*	*3.8-4.0*	*4.0-4.2*	*4.2-4.4*	*4.4-4.6*	*4.6-4.8*	*4.8-5.0*	*5.0-5.2*	*5.2-5.4*	*5.4-5.6*	*5.6-5.8*
.0	1.52E 01	1.19E 01	8.71E 00	6.92E 00	6.77E 00	6.71E 00	6.91E 00	7.22E 00	7.43E 00	7.58E 00	7.70E 00	7.64E 00
.500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00
1.00	3.97E-01	3.83E-01	3.65E-01	3.55E-01	3.55E-01	3.53E-01	3.46E-01	3.37E-01	3.30E-01	3.23E-01	3.12E-01	2.83E-01
1.50	1.98E-01	1.91E-01	1.70E-01	1.50E-01	1.41E-01	1.33E-01	1.27E-01	1.21E-01	1.14E-01	1.07E-01	9.85E-02	8.66E-02
2.00	9.91E-02	9.56E-02	7.94E-02	6.35E-02	5.61E-02	5.03E-02	4.69E-02	4.35E-02	3.98E-02	3.53E-02	3.12E-02	2.65E-02
2.50	4.51E-02	4.79E-02	3.93E-02	2.83E-02	2.36E-02	2.00E-02	1.76E-02	1.53E-02	1.31E-02	1.06E-02	8.76E-03	7.27E-03
3.00	1.74E-02	2.04E-02	1.77E-02	1.25E-02	9.39E-03	7.26E-03	5.77E-03	4.43E-03	3.52E-03	2.71E-03	2.14E-03	1.80E-03
4.00	5.14E-04	6.79E-04	5.97E-04	3.88E-04	2.60E-04	1.84E-04	1.40E-04	1.05E-04	8.04E-05	5.80E-05	4.30E-05	3.01E-05
5.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NORMFLUX=	3.50E 08	4.41E 08	7.12E 08	5.50E 08	3.56E 08	5.04E 08	5.01E 08	3.34E 08	1.71E 08	1.92E 08	2.07E 08	1.40E 08

ENERGY LEVELS >(MEV)	L-BANDS (MAGNETIC SHELL PARAMETER IN EARTH RADII) L-BANDS *5.8-6.0*	*6.0-6.2*	*6.2-6.4*	*6.4-6.6*	*6.6-6.8*	*6.8-7.0*	*7.0-7.2*	*7.2-7.4*	*7.4-7.6*	*7.6-7.8*	*7.8-8.0*	*8.0-8.2*
.0	7.56E 00	8.10E 00	9.54E 00	1.13E 01	1.34E 01	1.60E 01	2.03E 01	2.84E 01	3.67E 01	6.38E 01	1.17E 02	3.34E 03
.500	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00	1.00E 00
1.00	2.56E-01	2.40E-01	2.36E-01	2.32E-01	2.10E-01	1.73E-01	1.48E-01	1.29E-01	1.18E-01	1.03E-01	8.95E-02	5.34E-02
1.50	7.62E-02	6.88E-02	6.46E-02	6.08E-02	5.19E-02	3.94E-02	3.16E-02	2.65E-02	2.37E-02	1.97E-02	1.63E-02	6.29E-03
2.00	2.27E-02	1.97E-02	1.77E-02	1.59E-02	1.28E-02	8.97E-03	6.74E-03	5.43E-03	4.73E-03	3.75E-03	2.97E-03	9.58E-04
2.50	6.10E-03	5.14E-03	4.37E-03	3.74E-03	2.90E-03	1.94E-03	1.41E-03	1.10E-03	9.39E-04	6.59E-04	4.29E-04	4.43E-05
3.00	1.54E-03	1.26E-03	9.57E-04	7.43E-04	5.61E-04	3.87E-04	2.86E-04	2.10E-04	1.68E-04	2.34E-05	0.0	0.0
4.00	2.20E-05	1.08E-05	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NORMFLUX=	1.18E 08	1.07E 08	5.59E 07	5.69E 07	3.22E 07	2.44E 07	2.21E 07	7.15E 06	1.13E 07	2.90E 06	1.73E 06	1.57E 06

Table 15

** ORBITAL FLUX STUDY WITH COMPOSITE PARTICLE ENVIRONMENTS : VETTES AE4. AE5. AP1. AP5. AP6. AP7 **** PROCEDURE : UNIFLUX OF 1972 **
** ELECTRON FLUXES EXPONENTIALLY DECAYED TO 1972. 0 WITH LIFETIMES: E.G.STASSINOPOULOS&P.VERZARIU ** CUTOFF TIMES: **
** MAGNETIC COORDINATES B AND L COMPUTED BY INVARA OF 1972 WITH ALLMAG. MODEL 4: CAIN&SWEENEY 120-TERM POGO 8/69 * TIME= 1965.0 **
** VEHICLE : NIMBUS UNFLX ** INCLINATION= 80DEG ** PERIGEE= 1111KM ** APOGEE= 1111KM ** B/L ORBIT TAPE: TD8109 ** PERIOD= 1.792 **

LOW ENERGY PROTONS

****** SPECTRUM IN PERCENT DELTA ENERGY ******

ENERGY RANGES (MEV)	AVERAGED TOTAL FLUX #/CM**2/SEC	AVERAGED TOTAL FLUX #/CM**2/DAY	SPECTRUM PER CENT
.100-.500	6.288E 04	5.433E 09	87.131
.500-.900	3.902E 03	3.371E 08	5.407
.900-1.10	6.766E 02	5.846E 07	0.937
1.10-1.50	8.001E 02	6.913E 07	1.109
1.50-2.00	5.720E 02	4.942E 07	0.793
2.00-2.50	3.903E 02	3.373E 07	0.541
2.50-3.00	3.058E 02	2.642E 07	0.424
3.00-3.50	2.550E 02	2.204E 07	0.353
3.50-OVER	2.386E 03	2.061E 08	3.306
TOTAL	7.217E 04	6.235E 09	100.000

*** COMPOSITE ORBIT SPECTRUM ***

ENERGY LEVELS >(MEV)	AVERAGED INTEG.FLUX #/CM**2/SEC	AVERAGED INTEG.FLUX #/CM**2/DAY
.100	7.217E 04	6.235E 09
.300	1.692E 04	1.462E 09
.500	9.288E 03	8.024E 08
.700	6.644E 03	5.741E 08
.900	5.386E 03	4.653E 08
1.10	4.709E 03	4.069E 08
1.30	4.247E 03	3.669E 08
1.50	3.909E 03	3.377E 08
1.75	3.589E 03	3.101E 08
2.00	3.337E 03	2.883E 08
2.25	3.128E 03	2.702E 08
2.50	2.947E 03	2.546E 08
2.75	2.786E 03	2.407E 08
3.00	2.641E 03	2.282E 08
3.50	2.386E 03	2.061E 08

* EXPOSURE INDEX-ENERGY >.100MEV *

INTENSITY RANGES #/CM**2/SEC	EXPOSURE DURATION (HOURS)	TOTAL # OF ACCUMULATED PARTICLES
ZERO FLUX	17.967	0.0
1.E0-1.E1	1.783	2.154E 04
1.E1-1.E2	1.867	2.941E 05
1.E2-1.E3	4.067	6.884E 06
1.E3-1.E4	6.417	8.533E 07
1.E4-1.E5	8.700	1.269E 09
1.E5-1.E6	6.700	8.699E 09
1.E6-1.E7	0.500	2.411E 09
1.E7-OVER	0.0	0.0
TOTAL	48.000	1.247E 10

Table 16

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** ORBITAL FLUX STUDY WITH COMPOSITE PARTICLE ENVIRONMENTS : VETTES AE4. AE5. AP1. AP5. AP6. AP7 **** PROCEDURE : UNIFLUX OF 1972 **
** ELECTRON FLUXES EXPONENTIALLY DECAYED TO 1972. 0 WITH LIFETIMES: E.G.STASSINOPOULOS&P.VERZARIU ** CUTOFF TIMES:              **
** MAGNETIC COORDINATES B AND L COMPUTED BY INVARA OF 1972 WITH ALLMAG. MODEL  4:  CAIN&SWEENEY 120-TERM POGO 8/69 * TIME= 1965.0 **
** VEHICLE : NIMBUS UNFLX ** INCLINATION= 80DEG ** PERIGEE= 1111KM ** APOGEE= 1111KM ** B/L ORBIT TAPE: TDC109 ** PERIOD= 1.792 **
****************************************************************************************************************
                              ************   HIGH ENERGY PROTONS   ************
                              ***********************************************
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****** SPECTRUM IN PERCENT DELTA ENERGY ******

ENERGY RANGES (MEV)	AVERAGED TOTAL FLUX #/CM**2/SEC	AVERAGED TOTAL FLUX #/CM**2/DAY	SPECTRUM PER CENT
3.00-5.00	8.986E 02	7.764E 07	34.028
5.00-10.0	9.434E 02	8.151E 07	35.725
10.0-15.0	2.772E 02	2.395E 07	10.498
15.0-20.0	7.710E 01	6.662E 06	2.920
20.0-25.0	4.035E 01	3.486E 06	1.528
25.0-30.0	3.557E 01	3.074E 06	1.347
30.0-50.0	1.081E 02	9.337E 06	4.092
50.0-100.	9.593E 01	8.288E 06	3.633
100.-OVER	1.645E 02	1.421E 07	6.229
TOTAL	2.641E 03	2.282E 08	100.000

*** COMPOSITE ORBIT SPECTRUM ***

ENERGY LEVELS >(MEV)	AVERAGED INTEG.FLUX #/CM**2/SEC	AVERAGED INTEG.FLUX #/CM**2/DAY
3.00	2.641E 03	2.282E 08
4.00	2.166E 03	1.872E 08
5.00	1.742E 03	1.505E 08
7.00	1.158E 03	1.001E 08
10.0	7.987E 02	6.901E 07
12.0	6.705E 02	5.793E 07
15.0	5.215E 02	4.506E 07
18.0	4.621E 02	3.993E 07
20.0	4.444E 02	3.840E 07
25.0	4.041E 02	3.491E 07
30.0	3.685E 02	3.184E 07
50.0	2.604E 02	2.250E 07
60.0	2.371E 02	2.048E 07
70.0	2.162E 02	1.868E 07
100.	1.645E 02	1.421E 07

* EXPOSURE INDEX-ENERGY >5.00MEV *

INTENSITY RANGES #/CM**2/SEC	EXPOSURE DURATION (HOURS)	TOTAL # OF ACCUMULATED PARTICLES
ZERO FLUX	29.833	0.0
1.E0-1.E1	2.233	2.709E 04
1.E1-1.E2	3.867	5.946E 05
1.E2-1.E3	4.817	5.956E 06
1.E3-1.E4	4.267	6.592E 07
1.E4-1.E5	2.983	2.286E 08
1.E5-1.E6	0.0	0.0
1.E6-1.E7	0.0	0.0
1.E7-OVER	0.0	0.0
TOTAL	48.000	3.011E 08

Table 17

** ORBITAL FLUX STUDY WITH COMPOSITE PARTICLE ENVIRONMENTS : VETTES AE4, AE5, AP1, AP5, AP6, AP7 **** PROCEDURE : UNIFLUX OF 1972 **
** ELECTRON FLUXES EXPONENTIALLY DECAYED TO 1972.0 WITH LIFETIMES: E.G.STASSINOPOULOS&P.VERZARIU ** CUTOFF TIMES: **
** MAGNETIC COORDINATES B AND L COMPUTED BY INVARA OF 1972 WITH ALLMAG, MODEL 4: CAIN&SWEENEY 120-TERM POGO 8/69 * TIME= 1965.0 **
** VEHICLE : NIMBUS UNFLX ** INCLINATION= 80DEG ** PERIGEE= 1111KM ** APOGEE= 1111KM ** B/L ORBIT TAPE: TD8109 ** PERIOD= 1.792 **

************ ELECTRONS ************

****** SPECTRUM IN PERCENT DELTA ENERGY ******

ENERGY RANGES (MEV)	AVERAGED TOTAL FLUX #/CM**2/SEC	AVERAGED TOTAL FLUX #/CM**2/DAY	SPECTRUM PER CENT
.0 -.500	2.307E 06	1.593E 11	94.584
.500-1.00	1.094E 05	9.456E 09	4.486
1.00-1.50	1.285E 04	1.111E 09	0.527
1.50-2.00	5.102E 03	4.408E 08	0.209
2.00-2.50	2.729E 03	2.358E 08	0.112
2.50-3.00	1.285E 03	1.111E 08	0.053
3.00-4.00	6.917E 02	5.976E 07	0.028
4.00-5.00	1.340E 01	1.158E 06	0.001
5.00-OVER	0.0	0.0	0.0
TOTAL	2.439E 06	2.108E 11	100.000

*** COMPOSITE ORBIT SPECTRUM ***

ENERGY LEVELS >(MEV)	AVERAGED INTEG.FLUX #/CM**2/SEC	AVERAGED INTEG.FLUX #/CM**2/DAY
.0	2.439E 06	2.108E 11
.250	4.620E 05	3.992E 10
.500	1.321E 05	1.141E 10
.750	4.426E 04	3.824E 09
1.00	2.268E 04	1.959E 09
1.25	1.500E 04	1.296E 09
1.50	9.822E 03	8.486E 08
1.75	6.976E 03	6.027E 08
2.00	4.719E 03	4.078E 08
2.50	1.990E 03	1.720E 08
3.00	7.051E 02	6.092E 07
3.50	1.272E 02	1.099E 07
4.00	1.340E 01	1.158E 06
4.50	2.865E-01	2.475E 04
5.00	0.0	0.0

* EXPOSURE INDEX-ENERGY >.500MEV *

INTENSITY RANGES #/CM**2/SEC	EXPOSURE DURATION (HOURS)	TOTAL # OF ACCUMULATED PARTICLES
ZERO FLUX	21.250	0.0
1.E0-1.E1	0.900	1.402E 04
1.E1-1.E2	1.517	2.392E 05
1.E2-1.E3	3.683	5.497E 06
1.E3-1.E4	3.767	5.343E 07
1.E4-1.E5	6.067	1.021E 09
1.E5-1.E6	9.500	8.599E 09
1.E6-1.E7	1.317	1.315E 10
1.E7-OVER	0.0	0.0
TOTAL	48.000	2.283E 10

Table 18

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** ORBITAL FLUX STUDY WITH COMPOSITE PARTICLE ENVIRONMENTS : VETTES AE4, AE5, AP1, AP5, AP6, AP7 **** PROCEDURE : UNIFLUX OF 1972 **

** ELECTRON FLUXES EXPONENTIALLY DECAYED TO 1972. 0 WITH LIFETIMES: E.G.STASSINOPOULOS&P.VERZARIU ** CUTOFF TIMES: **

** MAGNETIC COORDINATES B AND L COMPUTED BY INVARA OF 1972 WITH ALLMAG, MODEL 4: CAIN&SWEENEY 120-TERM POGO 8/69 * TIME= 1965.0 **

** VEHICLE : NIMBUS UNFLX ** INCLINATION= 80DEG ** PERIGEE= 1111KM ** APOGEE= 1111KM ** B/L ORBIT TAPE: TD8109 ** PERIOD= 1.792 **

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******************** LOW ENERGY PROTONS *********************

** TABLE OF PEAK AND TOTAL FLUXES PER PERIOD - ENERGY >.100 MEV **

****

PERIOD NUMBER	PEAK FLUX ENCOUNTERED #/CM**2/SEC	POSITION AT WHICH ENCOUNTERED LONGITUDE (DEG)	LATITUDE (DEG)	ALTITUDE (KM)	ORBIT TIME (HOURS)	FIELD(B) (GAUSS)	LINE(L) (E.R.)	TOTAL FLUX PER ORBIT #/CM**2/ORBIT
1	8.285E 05	74.621	-50.18	1117.03	1.15000	0.32218	4.63	2.465E 08
2	1.339E 06	49.722	-56.22	1118.82	2.96667	0.27947	4.61	4.018E 08
3	1.901E 06	25.544	-60.19	1120.51	4.78333	0.26004	4.38	5.646E 08
4	1.295E 06	5.950	-68.07	1122.92	6.61666	0.27344	4.83	5.440E 08
5	1.133E 06	-13.272	-72.56	1124.12	8.43333	0.28645	4.95	4.523E 08
6	1.130E 06	-36.391	-74.07	1124.50	10.23333	0.29499	4.65	3.578E 08
7	1.200E 06	61.439	-52.48	1121.70	12.26667	0.29623	4.58	4.448E 08
8	1.613E 06	30.377	-60.21	1123.61	14.01667	0.26493	4.62	7.595E 08
9	1.910E 06	-3.513	-67.67	1125.09	15.76667	0.26808	4.33	8.554E 08
10	1.116E 06	-43.929	-74.48	1125.99	17.51666	0.29890	4.64	5.343E 08
11	8.970E 05	3.510	60.93	1123.63	18.21666	0.32032	4.55	3.957E 08
12	8.357E 06	-26.235	56.42	1122.59	19.98331	0.32121	4.72	3.011E 08
13	6.191E 05	-114.574	-69.80	1125.49	22.91664	0.34109	4.50	2.448E 08
14	6.112E 05	82.876	-48.22	1116.24	24.41664	0.33774	4.47	2.233E 08
15	1.256E 06	57.769	-53.27	1118.08	26.23331	0.29055	4.58	3.346E 08
16	1.784E 06	33.273	-58.27	1119.86	28.04999	0.26281	4.41	5.232E 08
17	1.324E 06	12.679	-66.24	1122.43	29.88332	0.27025	4.82	5.509E 08
18	1.180E 06	-7.795	-70.86	1123.74	31.70000	0.28011	4.78	4.601E 08
19	1.473E 06	-31.593	-72.45	1124.16	33.50000	0.28699	4.37	4.228E 08
20	1.082E 06	-54.762	-73.97	1124.56	35.29999	0.30175	4.40	3.956E 08
21	1.818E 06	41.859	-55.81	1122.83	37.31667	0.26748	4.37	6.728E 08
22	1.547E 06	9.839	-63.45	1124.55	39.06667	0.25823	4.20	8.983E 08
23	1.233E 06	-32.104	-73.47	1126.09	40.79999	0.29124	4.60	6.307E 08
24	1.071E 06	-62.323	-74.59	1126.21	42.58331	0.30812	4.66	4.438E 08
25	9.223E 05	-16.636	57.65	1122.91	43.26666	0.31838	4.53	3.397E 08
26	6.738E 05	-45.872	53.08	1121.80	45.03331	0.33176	5.04	2.498E 08

Table 19

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** ORBITAL FLUX STUDY WITH COMPOSITE PARTICLE ENVIRONMENTS : VETTES AE4, AE5, AP1, AP5, AP6, AP7 **** PROCEDURE : UNIFLUX OF 1972 **

** ELECTRON FLUXES EXPONENTIALLY DECAYED TO 1972.0 WITH LIFETIMES: E.G.STASSINOPOULOS&P.VERZARIU ** CUTOFF TIMES: **

** MAGNETIC COORDINATES B AND L COMPUTED BY INVARA OF 1972 WITH ALLMAG, MODEL 4: CAIN&SWEENEY 120-TERM POGO 8/69 * TIME= 1965.0 **

** VEHICLE : NIMBUS UNFLX ** INCLINATION= 80DEG ** PERIGEE= 1111KM ** APOGEE= 1111KM ** B/L ORBIT TAPE: TD8109 ** PERIOD= 1.792 **

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******************** HIGH ENERGY PROTONS ********************

** TABLE OF PEAK AND TOTAL FLUXES PER PERIOD - ENERGY >5.00 MEV **

****

PERIOD NUMBER	PEAK FLUX ENCOUNTERED #/CM**2/SEC	POSITION AT WHICH ENCOUNTERED LONGITUDE (DEG)	LATITUDE (DEG)	ALTITUDE (KM)	ORBIT TIME (HOURS)	FIELD(B) (GAUSS)	LINE(L) (E.R.)	TOTAL FLUX PER ORBIT #/CM**2/ORBIT
1	9.383E 02	-100.260	0.0	1111.20	0.0	0.20148	1.21	3.310E 05
2	8.348E 03	42.668	-29.20	1109.76	2.83333	0.22141	1.88	2.880E 06
3	1.943E 04	15.964	-31.07	1110.33	4.63333	0.20016	1.88	8.490E 06
4	3.045E 04	-10.114	-36.21	1112.01	6.45000	0.18690	1.81	1.963E 07
5	4.181E 04	-39.414	-21.65	1107.64	8.16667	0.15905	1.31	2.615E 07
6	2.408E 04	-66.713	-26.81	1109.00	9.98333	0.16759	1.29	1.420E 07
7	4.206E 03	-92.437	-28.68	1109.54	11.78333	0.19833	1.31	2.873E 06
8	8.874E 03	40.476	-27.84	1116.05	14.18333	0.21720	1.82	3.440E 06
9	2.106E 04	13.252	-29.25	1115.42	15.96667	0.19716	1.80	9.063E 06
10	2.989E 04	-15.173	-37.22	1117.54	17.71666	0.18459	1.78	2.104E 07
11	4.171E 04	-39.759	-22.23	1113.87	19.58331	0.15881	1.31	2.653E 07
12	2.293E 04	-67.413	-26.94	1114.93	21.34999	0.16862	1.29	1.357E 07
13	4.408E 03	-92.917	-15.20	1112.66	23.20000	0.18408	1.20	2.427E 06
14	6.486E 02	-119.713	-13.33	1112.42	25.00000	0.19538	1.19	3.665E 05
15	4.244E 03	51.807	-30.48	1109.99	26.11664	0.23713	1.96	1.497E 06
16	1.535E 04	24.576	-29.06	1109.54	27.89999	0.20481	1.84	6.215E 06
17	2.523E 04	-1.560	-34.21	1111.19	29.71666	0.19067	1.84	1.524E 07
18	3.724E 04	-30.733	-19.64	1106.97	31.43330	0.16149	1.32	2.581E 07
19	3.366E 04	-56.588	-28.10	1109.21	33.26666	0.16364	1.32	1.970E 07
20	7.620E 03	-83.302	-29.97	1109.77	35.06667	0.18911	1.32	6.321E 06
21	5.632E 03	49.098	-29.84	1115.84	37.45000	0.23112	1.92	2.337E 06
22	1.679E 04	21.863	-31.25	1116.22	39.23331	0.20367	1.92	6.711E 06
23	2.674E 04	-5.985	-35.94	1117.49	41.00000	0.18894	1.85	1.639E 07
24	3.890E 04	-30.258	-17.66	1113.31	42.88332	0.16094	1.30	2.707E 07
25	3.260E 04	-58.295	-25.66	1114.94	44.63332	0.16213	1.29	1.909E 07
26	6.680E 03	-85.504	-27.07	1115.29	46.41664	0.18682	1.29	4.670E 06

Table 20

** ORBITAL FLUX STUDY WITH COMPOSITE PARTICLE ENVIRONMENTS : VETTES AE4, AE5, AP1, AP5, AP6, AP7 **** PROCEDURE : UNIFLUX OF 1972 **
** ELECTRON FLUXES EXPONENTIALLY DECAYED TO 1972. 0 WITH LIFETIMES: E.G.STASSINOPOULOS&P.VERZARIU ** CUTOFF TIMES: **
** MAGNETIC COORDINATES B AND L COMPUTED BY INVARA OF 1972 WITH ALLMAG, MODEL 4: CAIN&SWEENEY 120-TERM POGO 8/69 * TIME= 1965.0 **
** VEHICLE : NIMBUS UNFLX ** INCLINATION= 80DEG ** PERIGEE= 1111KM ** APOGEE= 1111KM ** B/L ORBIT TAPE: TD8109 ** PERIOD= 1.792 **

******************** ELECTRONS ********************
** TABLE OF PEAK AND TOTAL FLUXES PER PERIOD - ENERGY >.500 MEV **

PERIOD NUMBER	PEAK FLUX ENCOUNTERED #/CM**2/SEC	POSITION AT WHICH ENCOUNTERED LONGITUDE (DEG)	LATITUDE (DEG)	ALTITUDE (KM)	ORBIT TIME (HOURS)	FIELD(B) (GAUSS)	LINE(L) (E.R.)	TOTAL FLUX PER ORBIT #/CM**2/ORBIT
1	2.715E 05	73.540	-46.95	1115.86	1.13333	0.31422	3.88	1.671E 08
2	3.986E 05	48.314	-52.02	1117.69	2.95000	0.26912	3.97	2.585E 08
3	1.272E 06	13.751	-14.60	1106.21	4.55000	0.19271	1.40	4.695E 08
4	3.459E 06	-13.040	-16.48	1106.53	6.35000	0.17199	1.36	1.181E 09
5	6.265E 06	-38.496	-28.23	1109.43	8.20000	0.16313	1.39	2.088E 09
6	2.972E 06	-64.654	-33.38	1111.04	10.01667	0.17499	1.37	1.108E 09
7	3.538E 05	62.652	-49.26	1120.83	12.28333	0.29241	3.98	3.079E 08
8	4.364E 05	32.280	-57.05	1122.87	14.03333	0.25777	4.17	3.620E 08
9	1.101E 06	15.001	-16.10	1112.71	16.03331	0.19364	1.44	5.618E 08
10	3.773E 06	-12.170	-17.52	1112.96	17.81667	0.17258	1.38	1.279E 09
11	6.429E 06	-40.688	-28.80	1115.36	19.54999	0.16276	1.38	2.219E 09
12	2.429E 06	-68.473	-33.50	1116.58	21.31667	0.17812	1.37	1.066E 09
13	2.763E 05	-56.490	48.61	1120.58	21.73331	0.33547	4.44	2.338E 08
14	2.747E 05	82.876	-48.22	1116.24	24.41664	0.33774	4.47	1.661E 08
15	3.433E 05	57.769	-53.27	1118.08	26.23331	0.29055	4.58	2.120E 08
16	8.027E 05	22.831	-15.89	1106.21	27.83331	0.19915	1.44	3.716E 08
17	2.343E 06	-4.335	-14.46	1105.94	29.61664	0.17844	1.37	8.387E 08
18	5.701E 06	-30.313	-22.93	1107.77	31.45000	0.16292	1.36	1.894E 09
19	4.659E 06	-56.065	-31.38	1110.23	33.28331	0.16704	1.36	1.625E 09
20	7.126E 05	-82.749	-33.25	1110.83	35.08331	0.19443	1.37	4.087E 08
21	4.128E 05	41.859	-55.81	1122.83	37.31667	0.26748	4.37	3.031E 08
22	8.021E 05	24.080	-14.82	1112.81	39.31667	0.19894	1.41	4.982E 08
23	2.907E 06	-3.087	-16.24	1113.05	41.09999	0.17954	1.40	9.556E 08
24	6.007E 06	-31.093	-24.24	1114.60	42.84999	0.16284	1.37	2.078E 09
25	4.122E 06	-59.315	-32.22	1116.54	44.59999	0.16935	1.36	1.704E 09
26	5.373E 05	-86.569	-33.63	1116.94	46.38332	0.19994	1.38	3.342E 08

TABLE _

NIMBUS UNFLX

CIRCULAR

INCLINATION: 80 DEG

PERIGEE: 1111 KM

APOGEE: 1111 KM

DECAY DATE: 1972. 0.

**** EXPOSURE ANALYSIS ****

	PROTONS-LOW (E>.100MEV)	PROTONS-HIGH (E>5.00MEV)	ELECTRONS (E>.500MEV)
PERCENT OF TOTAL LIFE-TIME SPENT IN FLUX-FREE REGIONS* OF SPACE :	37.43 %	62.15 %	44.27 %
PERCENT OF TOTAL LIFE-TIME SPENT IN HIGH-INTENSITY REGIONS+ OF VAN ALLEN BELTS :	46.49 %	15.10 %	22.53 %
PERCENT OF TOTAL DAILY FLUX ACCUMULATED IN HIGH-INTENSITY REGIONS:	99.94 %	97.82 %	95.27 %

****

* <1 PARTICLE/CM**2/SEC

\+ >1.E5 EL/CM**2/SEC OR 1.E3 PR/CM**2/SEC

TABLE 21

NIMBUS UNFLX

CIRCULAR

INCLINATION: 80 DEG

PERIGEE: 1111 KM

APOGEE: 1111 KM

DECAY DATE: 1972. 0.

* PERCENT OF TOTAL LIFETIME SPENT INSIDE AND *
* OUTSIDE THE TRAPPED-PARTICLE RADIATION BELT *

INNER ZONE -TI-* (1.0 < L < 2.5)	:	52.95 %
OUTER ZONE -TO- (2.5 < L < 7.0)	:	24.79 %
EXTERNAL -TE- (L > 7.0)	:	22.26 %
TOTAL	:	100.00 %

*TIME IN INNER ZONE MAY BE SUBDIVIDED AS FOLLOWS:

OUTSIDE TRAPPING REGION : 0.42 %
(1.0 < L < 1.1)

INSIDE TRAPPING REGION : 52.53 %
(1.1 < L < 2.5)

TABLE ARRANGEMENT

Computer Produced Output Tables for Orbital Flux Integrations.

Standard Production Runs with UNIFLUX Program.

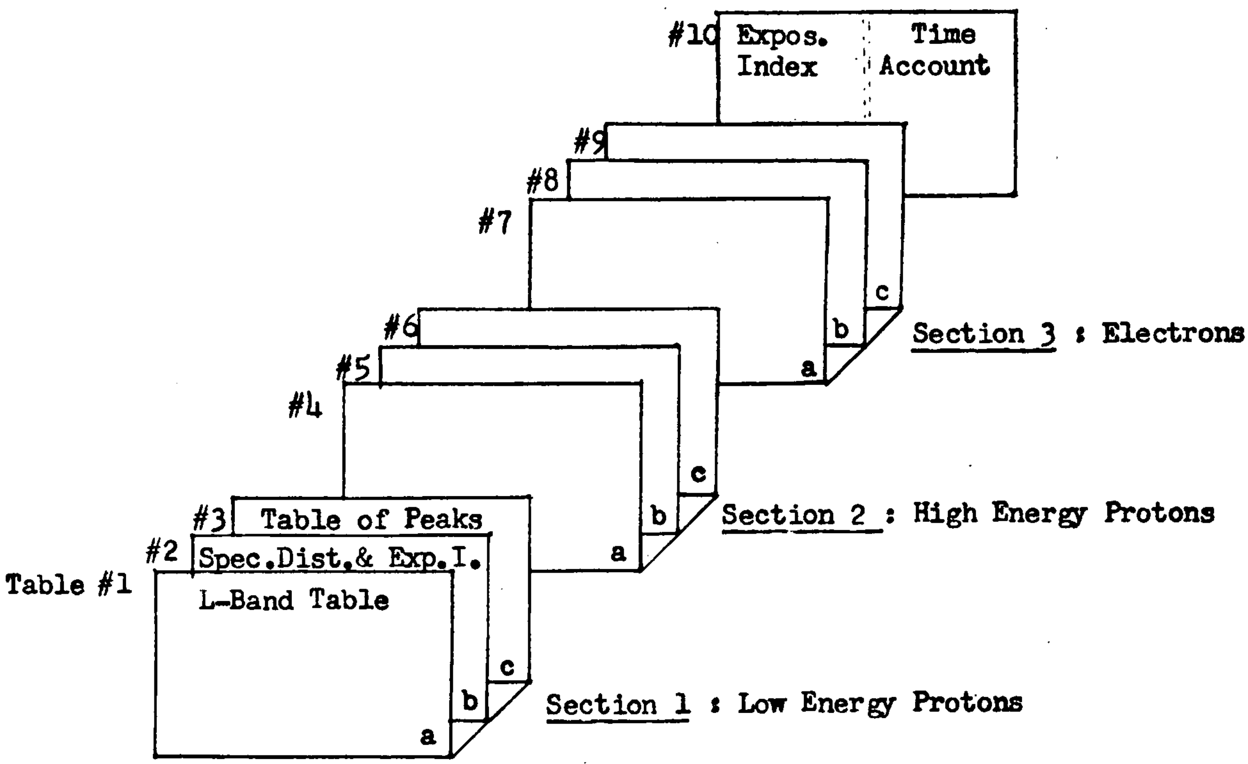

Figure 1 : Set of tables produced for every trajectory considered in a trapped particle radiation study.

PLOT ARRANGEMENT

Computer Produced Plots for Orbital Flux Integrations.

Standard Production Runs with UNIFLUX Program.

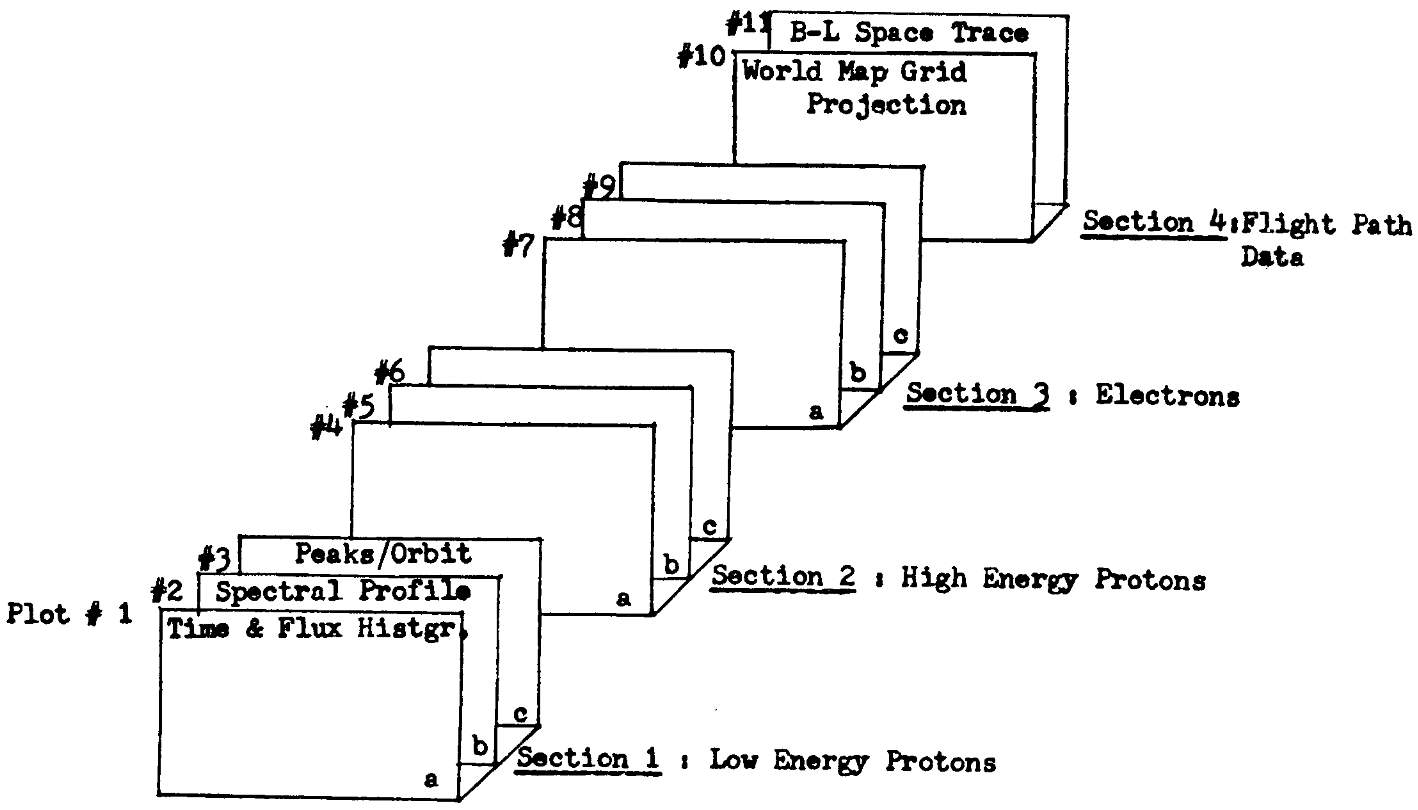

Figure 2 : Set of plots produced for every trajectory considered in a trapped particle radiation study.

FOLDOUT FRAME 1

FOLDOUT FRAME 2

Figure 3

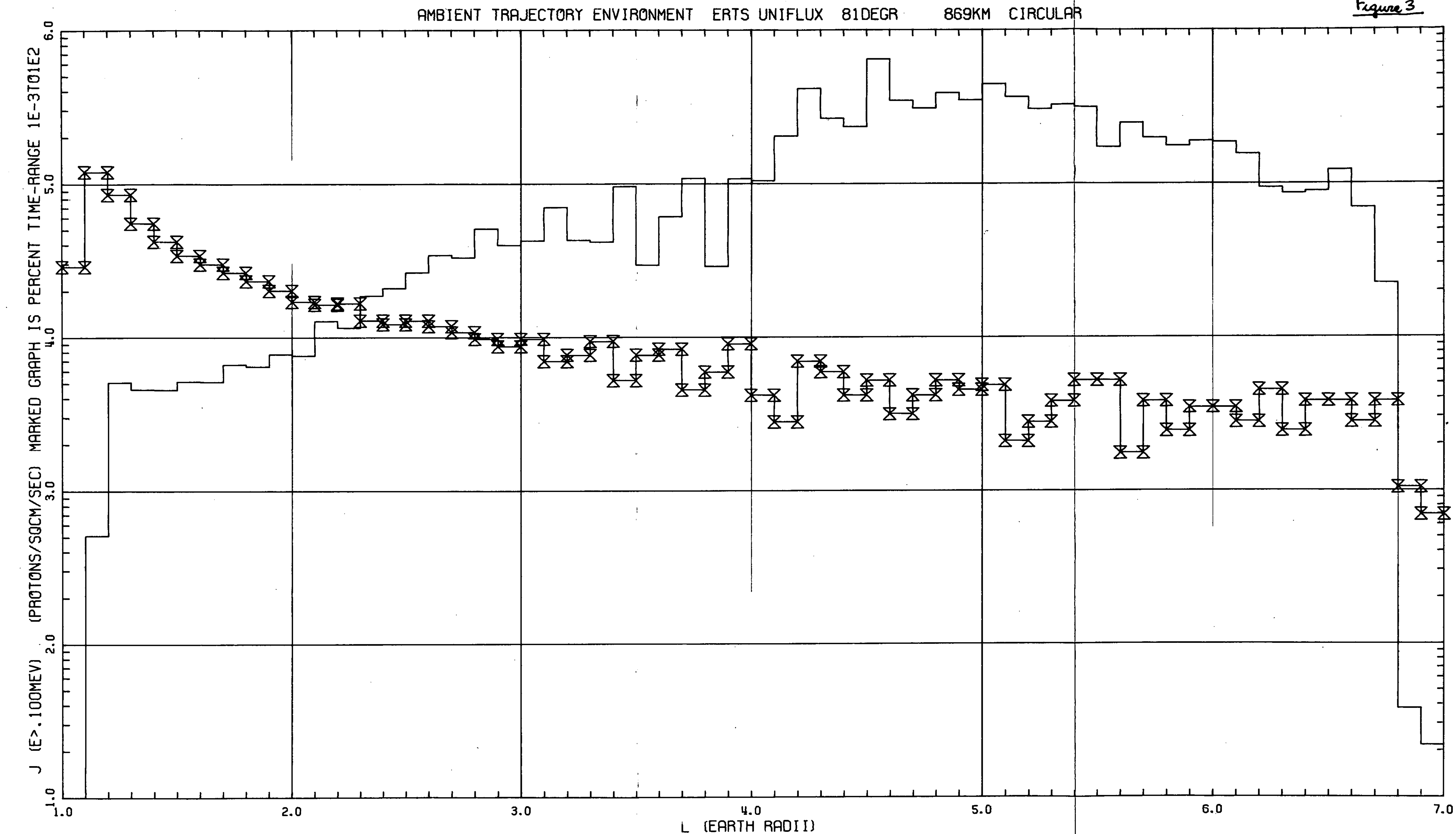

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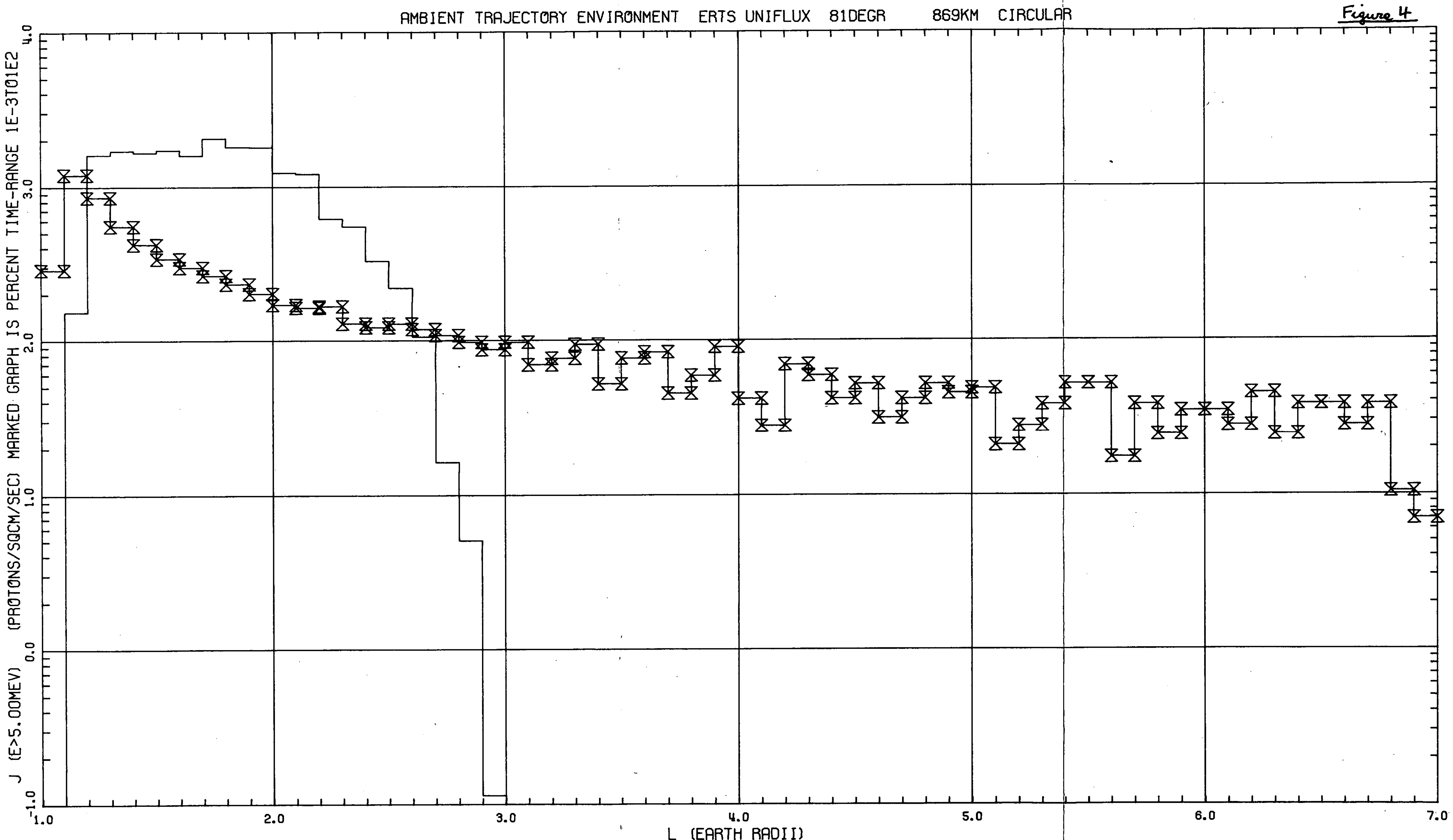
Figure 4



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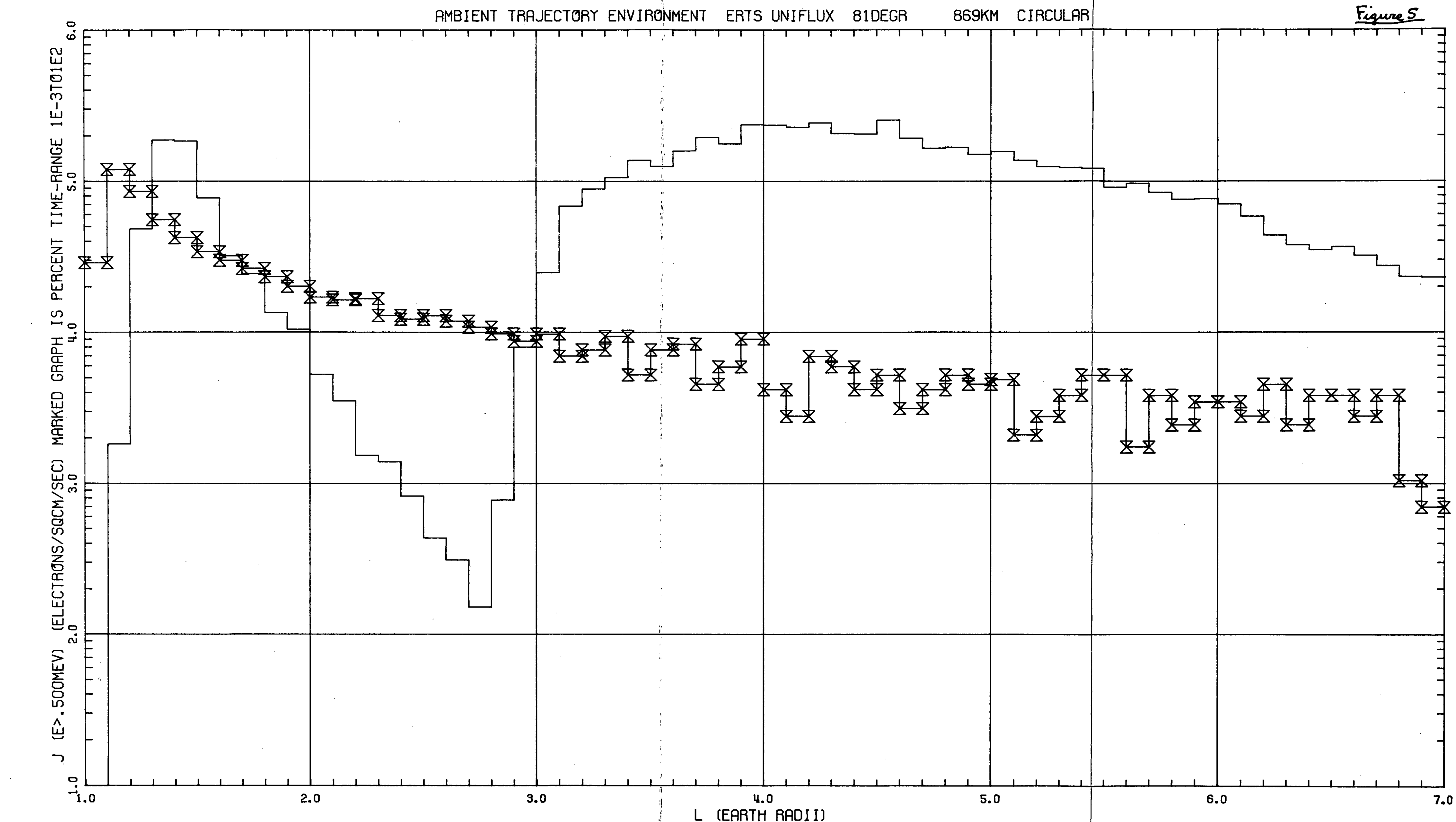

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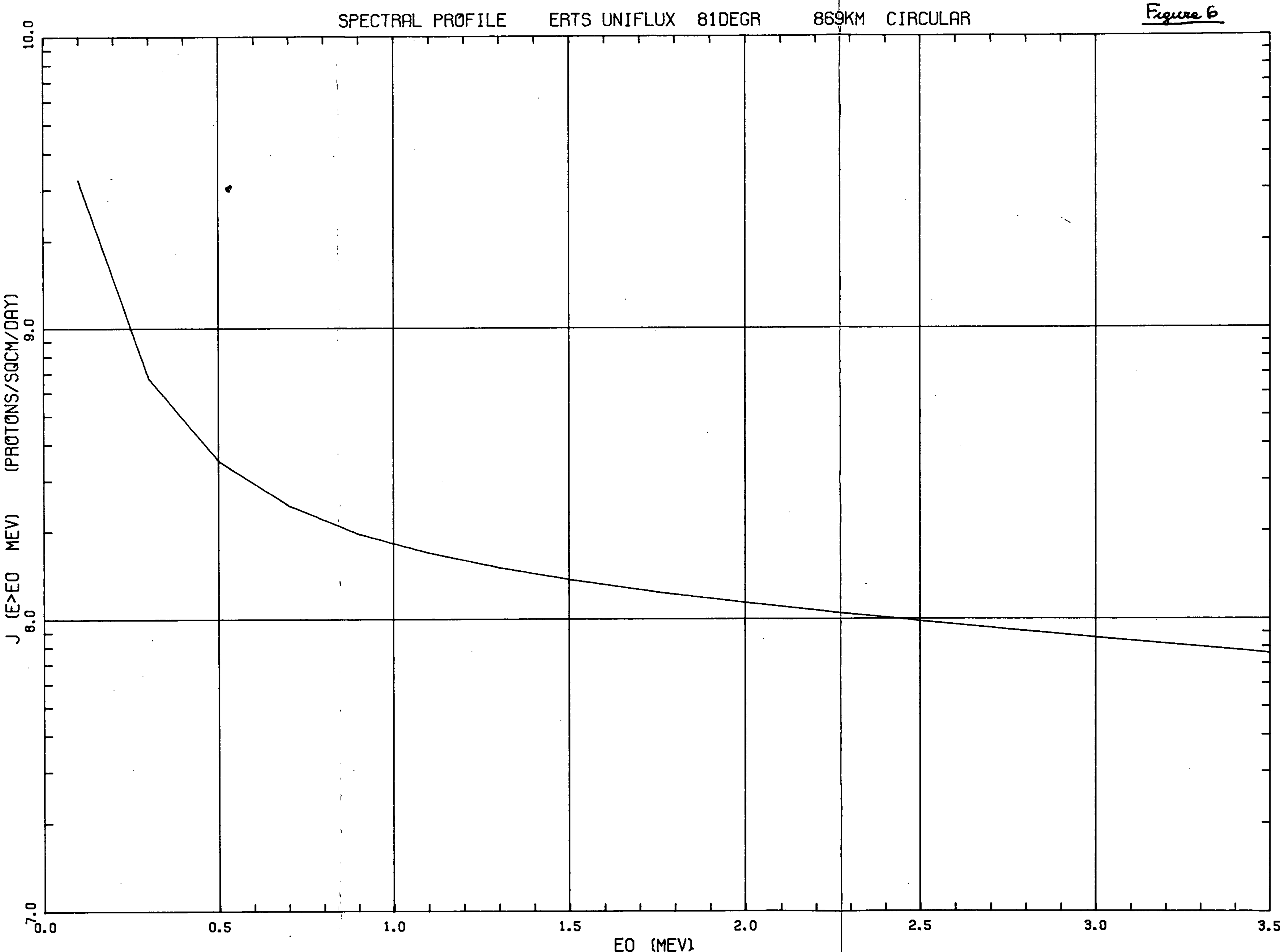
Figure 6



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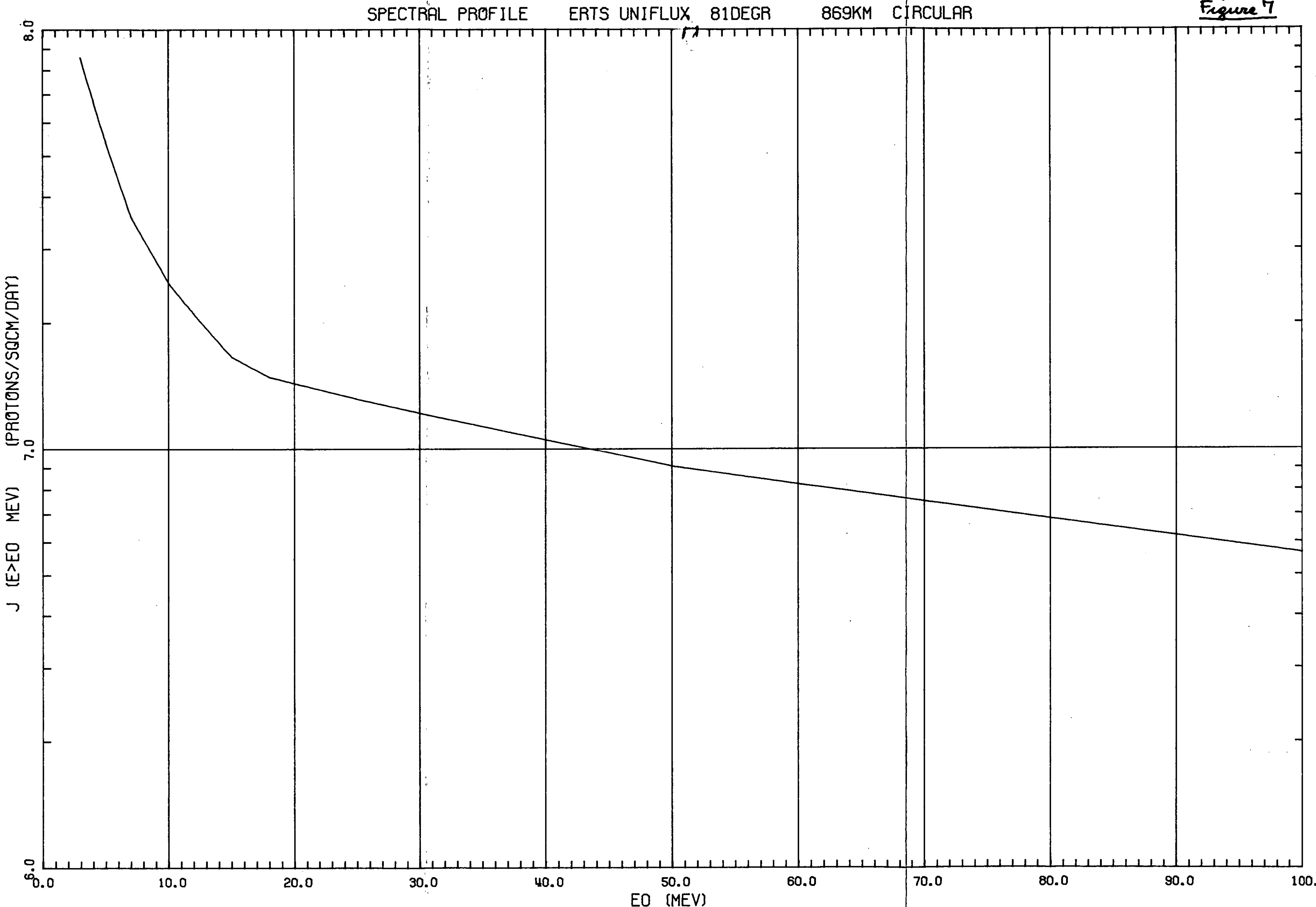

Figure 7

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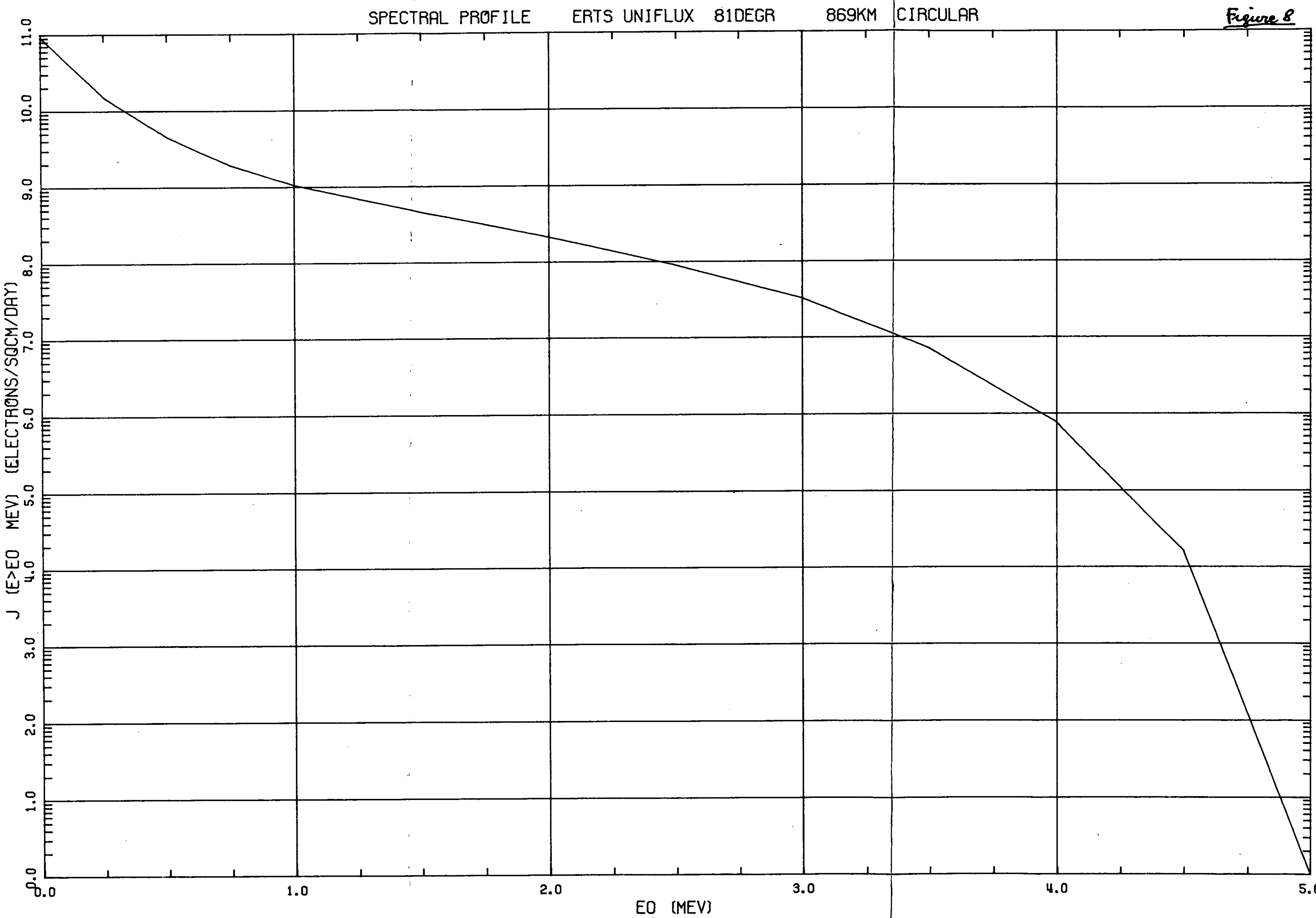

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Figure 9

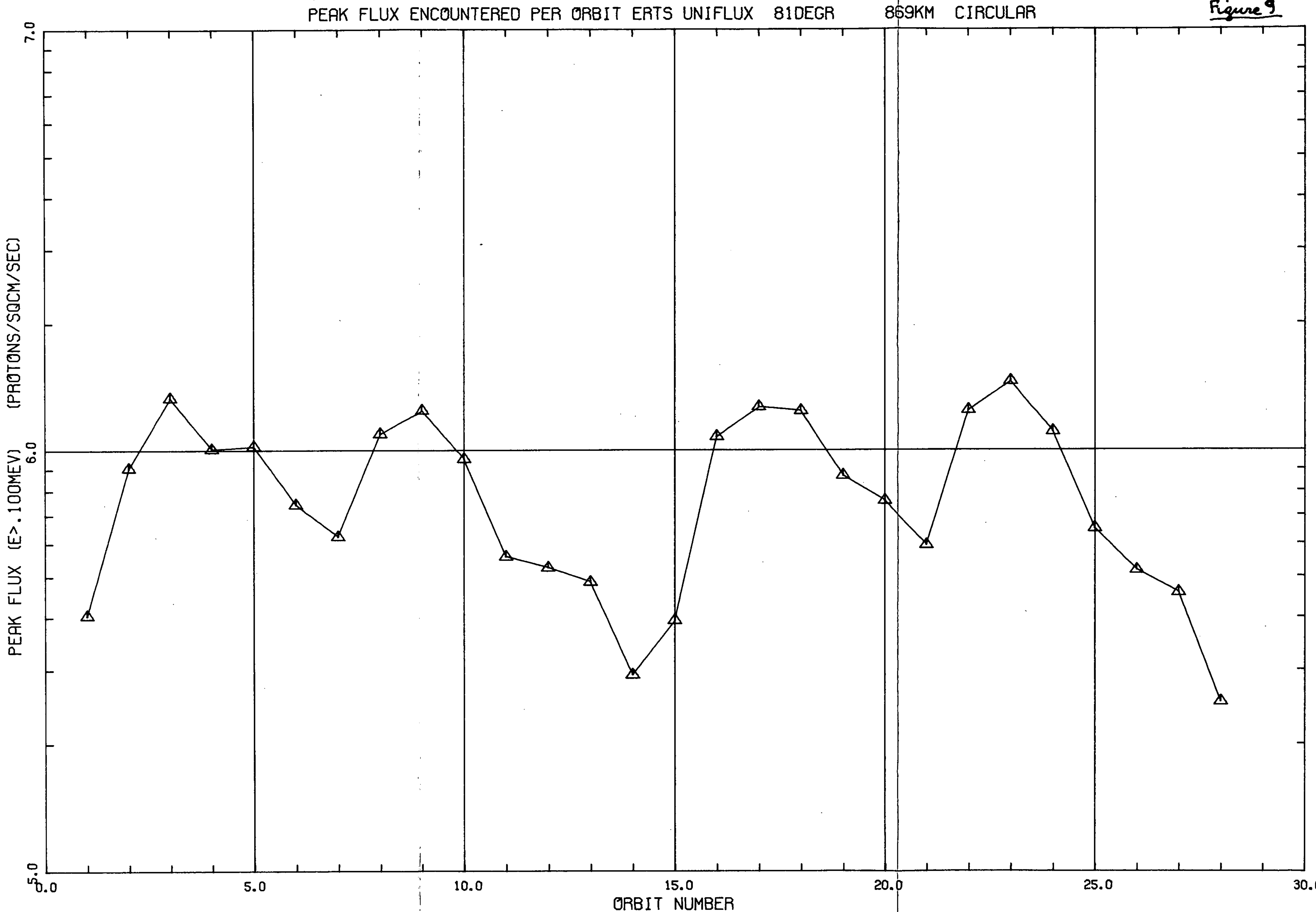

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Figure 10

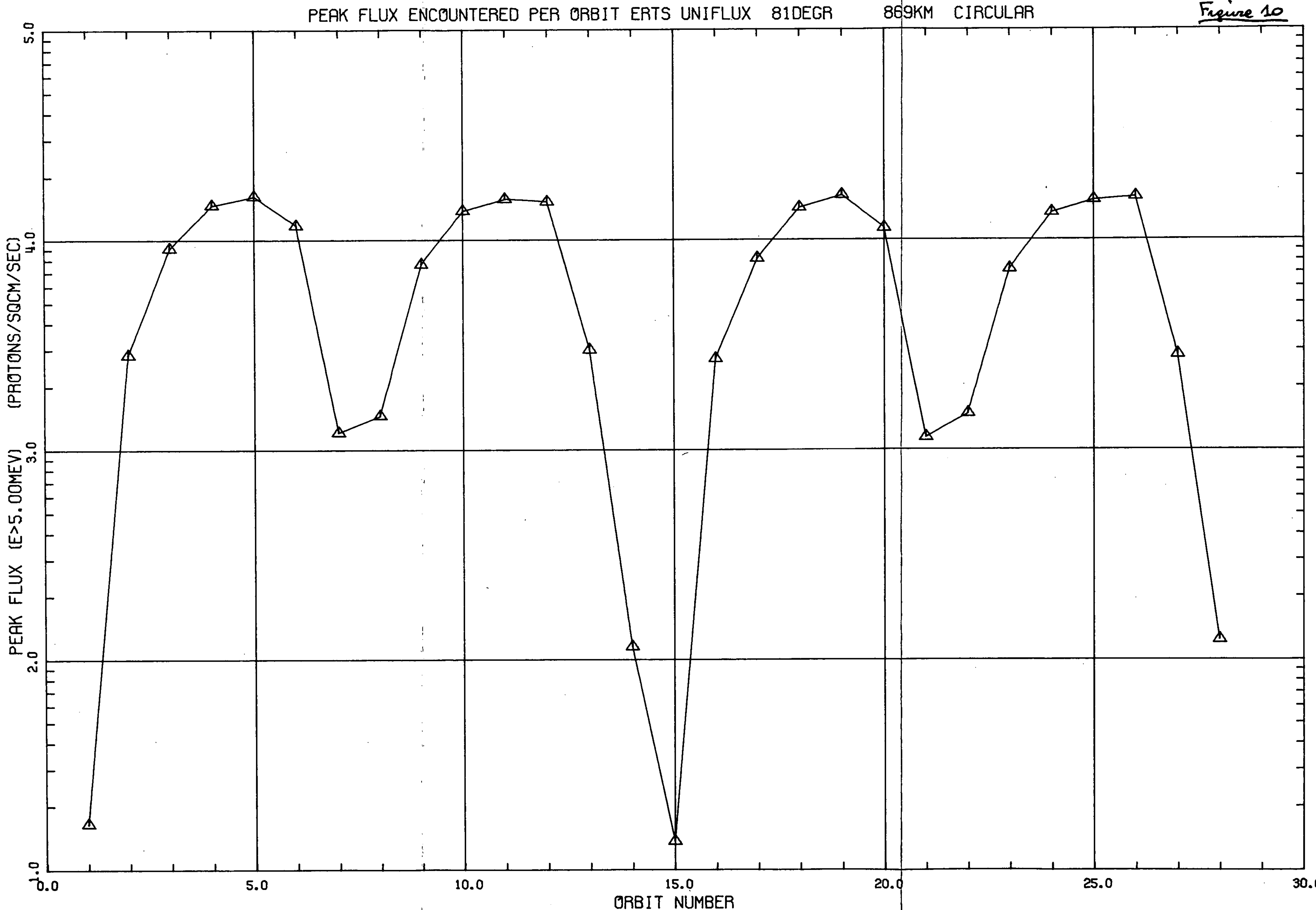

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Figure 11

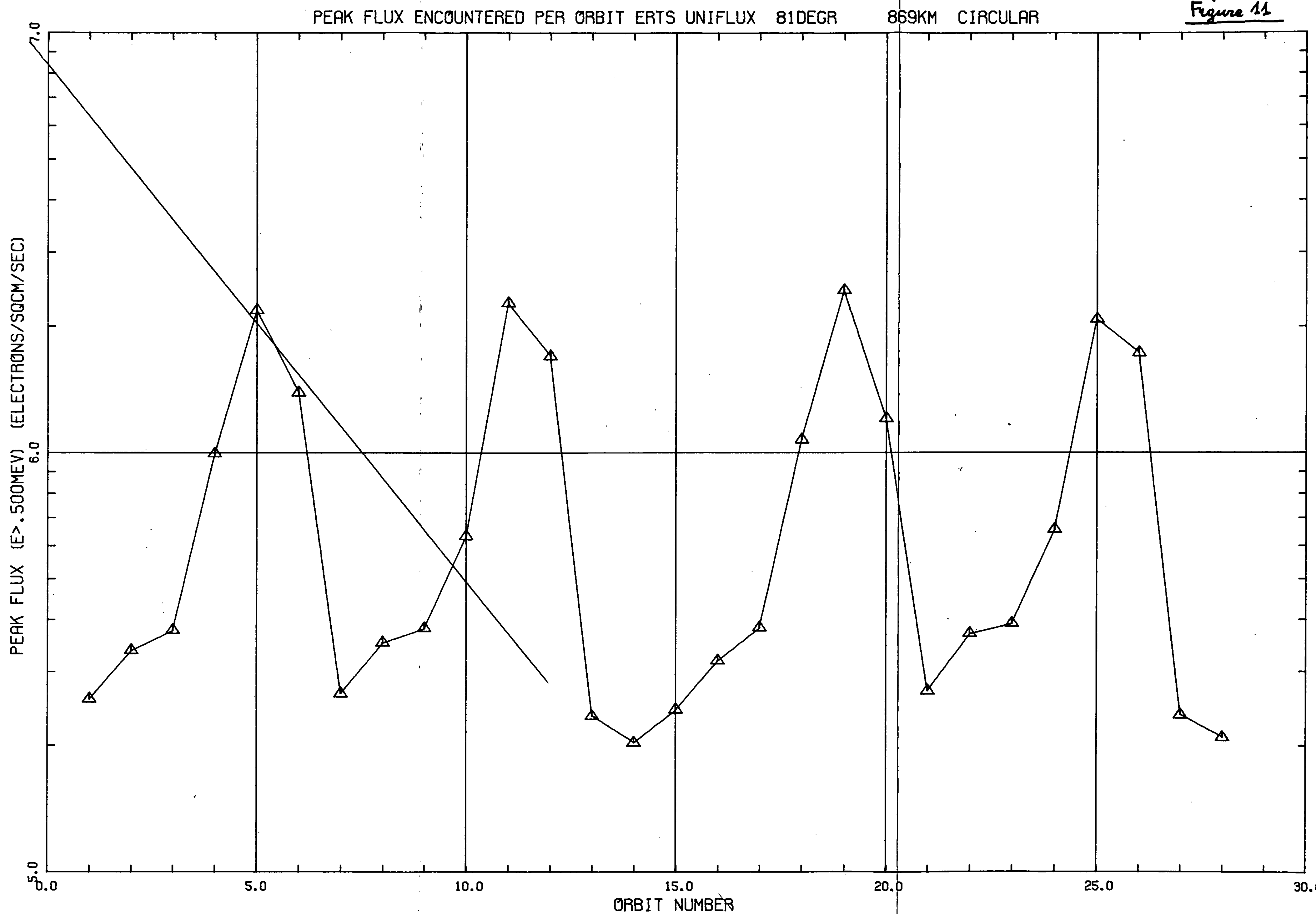

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Figure 12

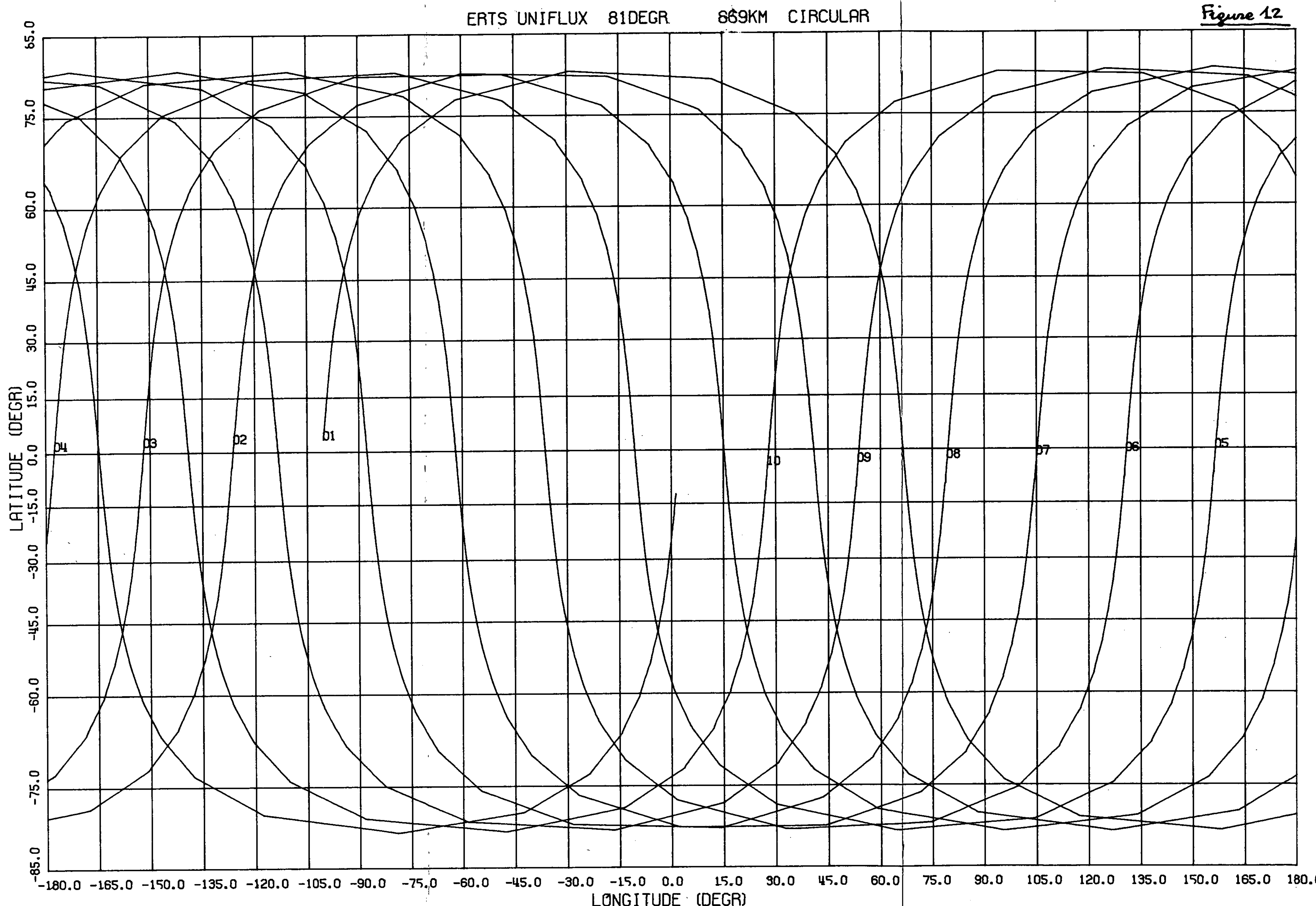

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Figure 13

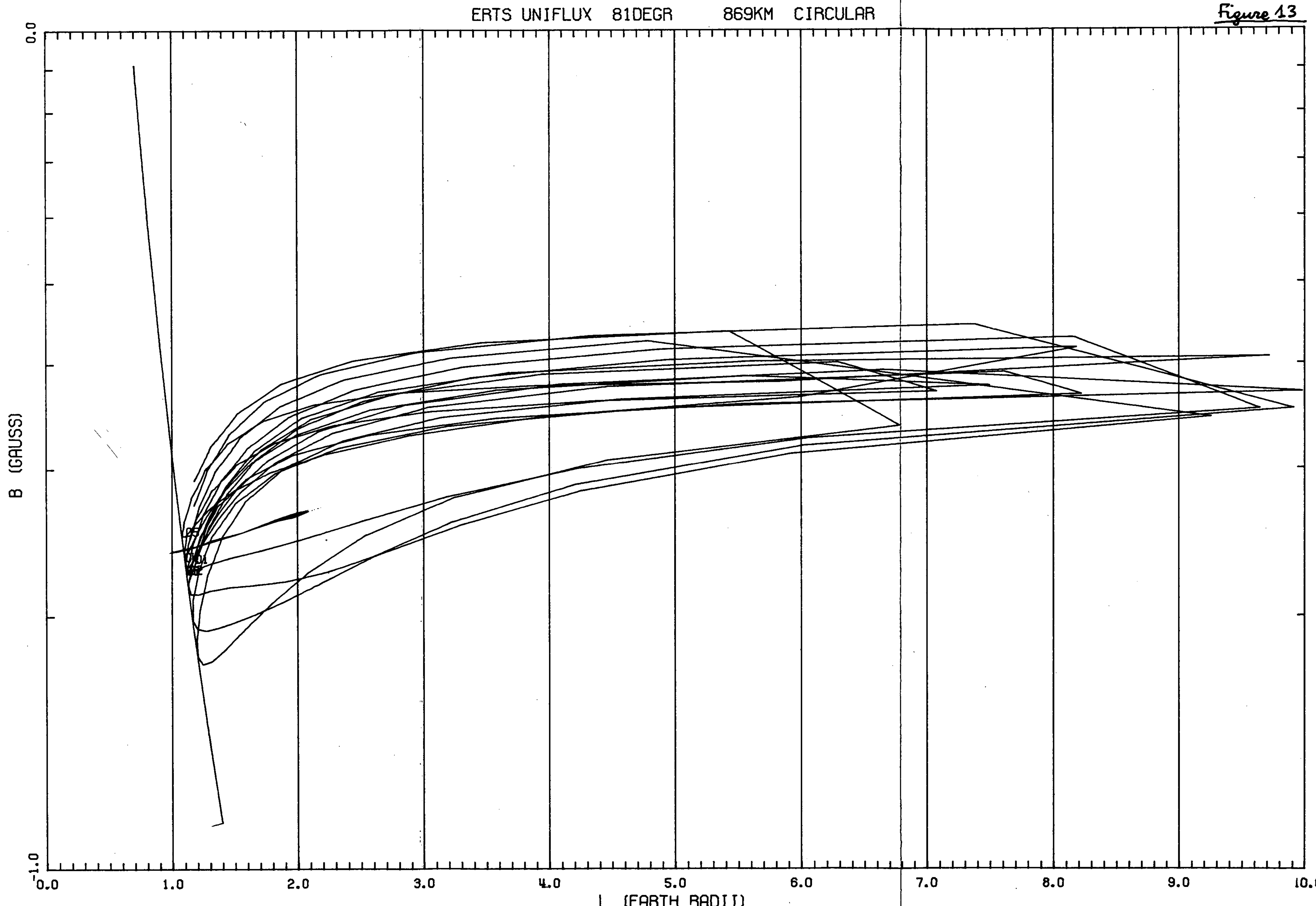

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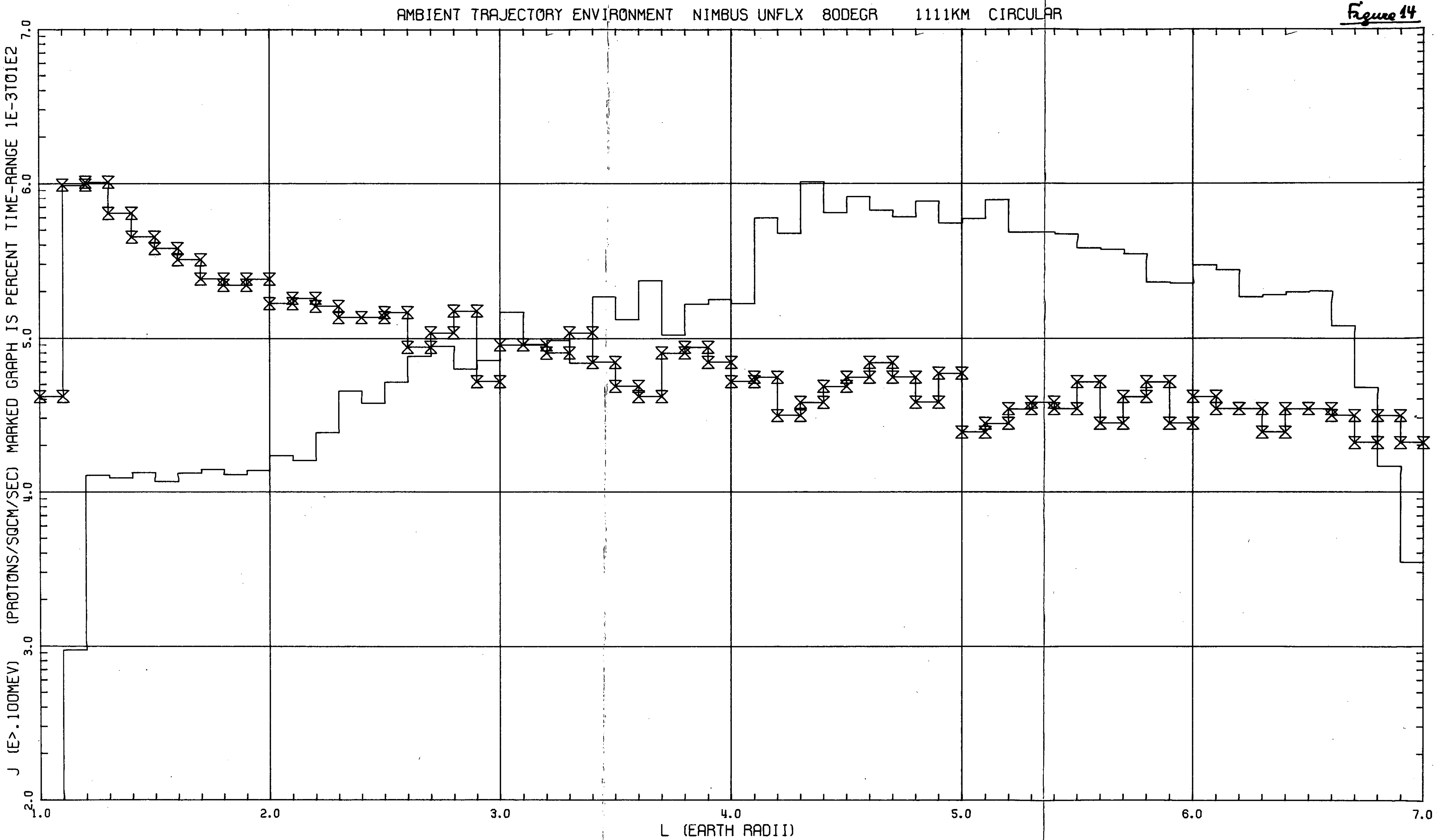
Figure 14



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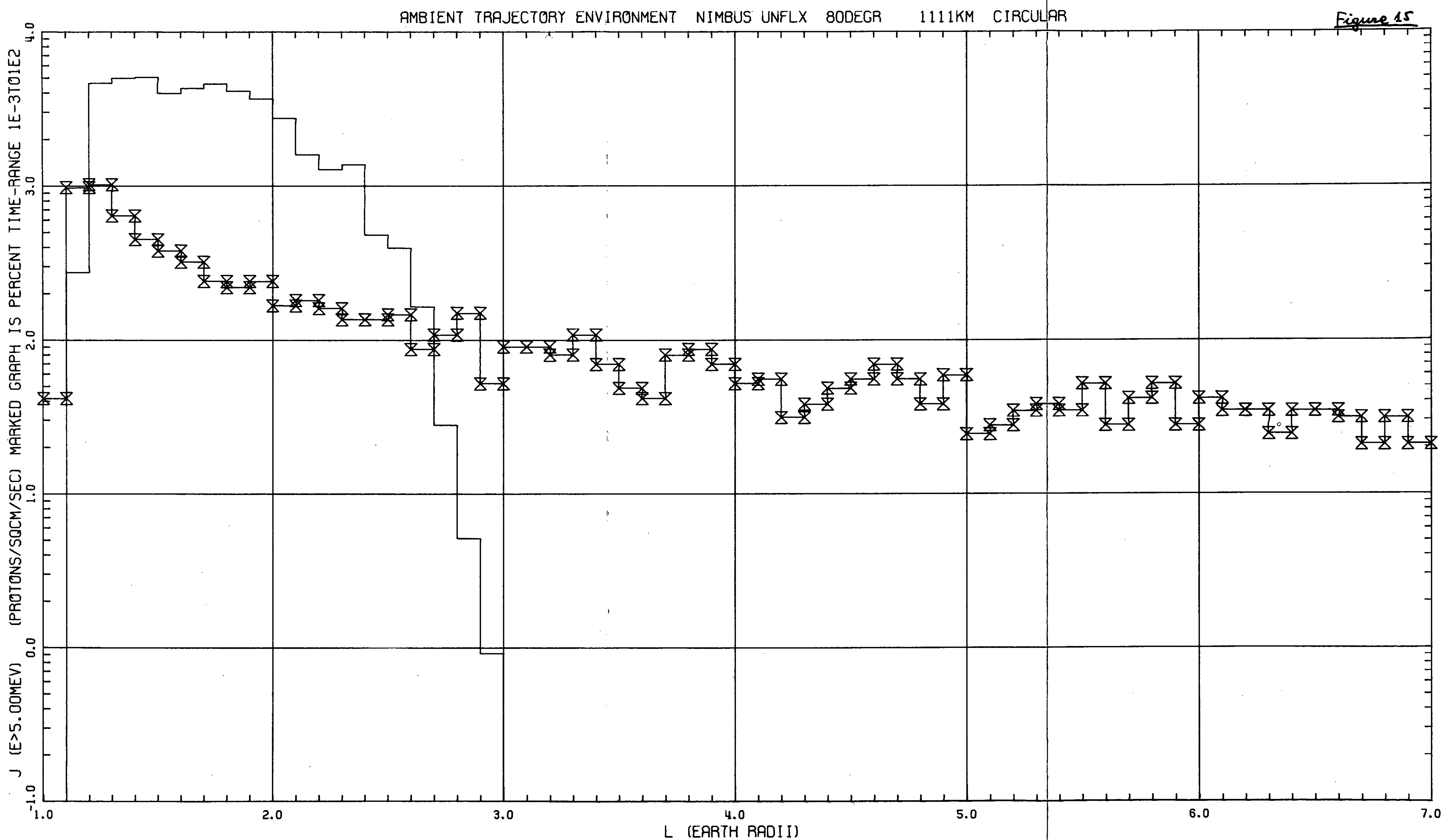

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Figure 16

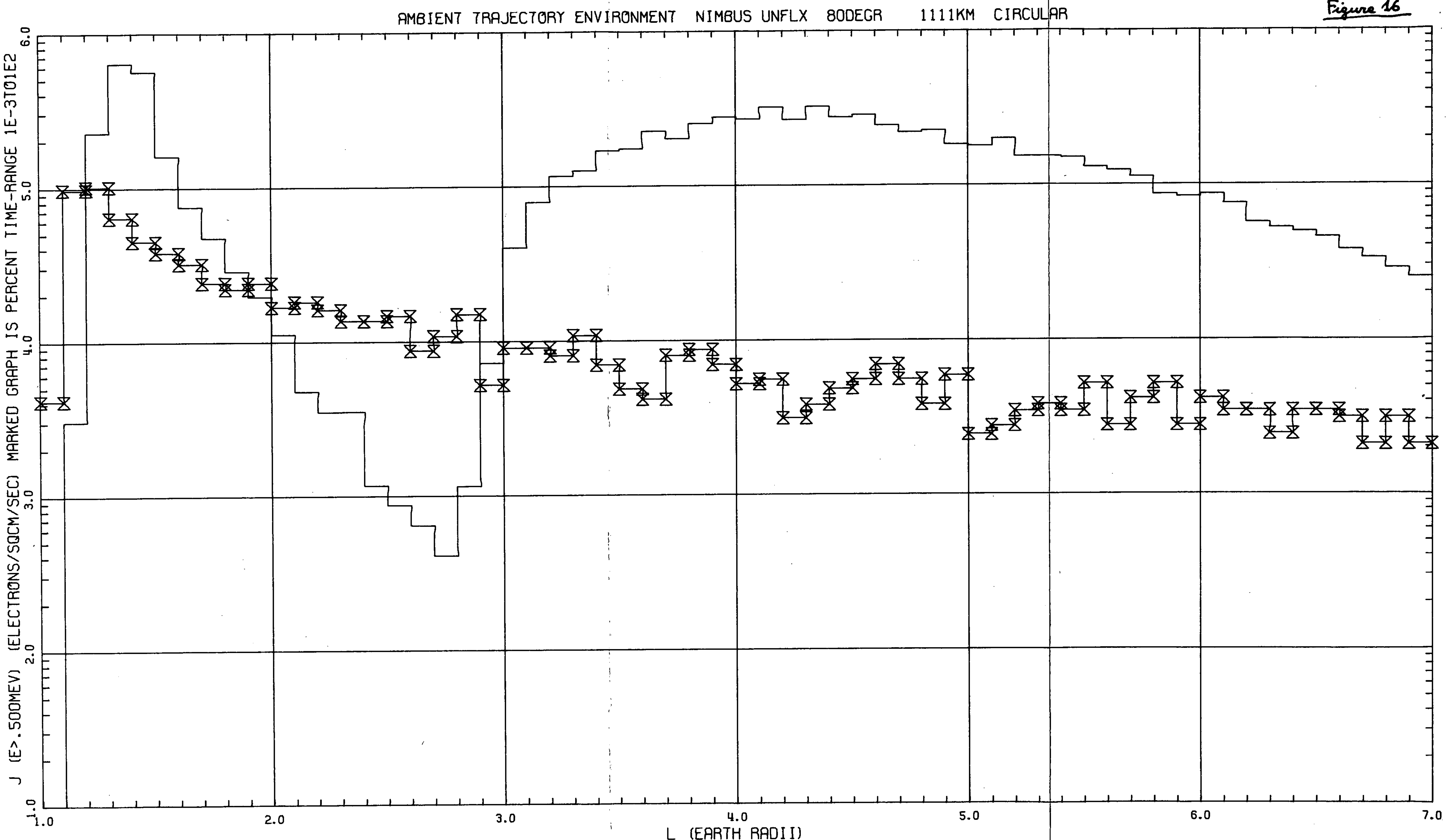

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Figure 17

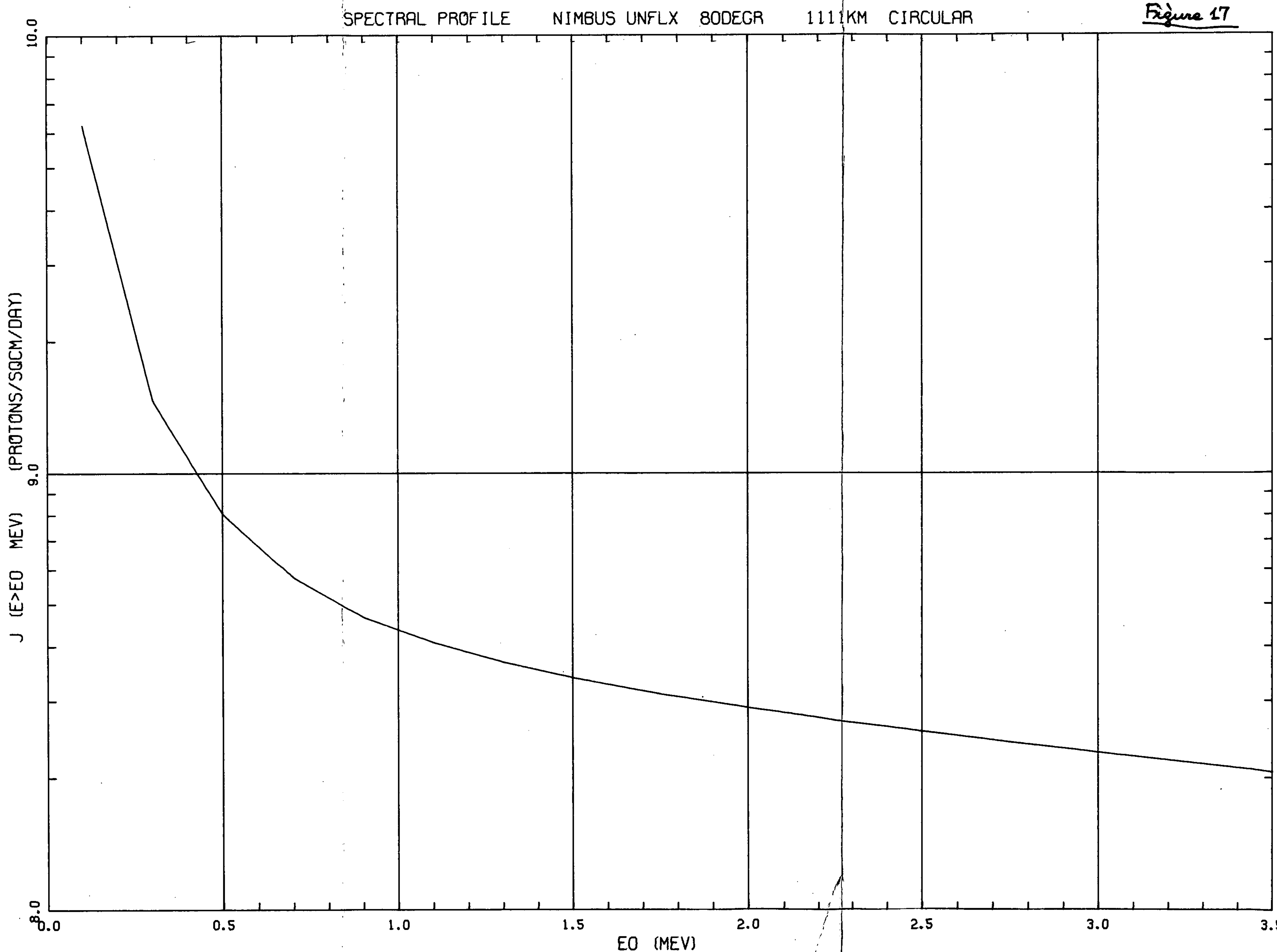

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Figure 18

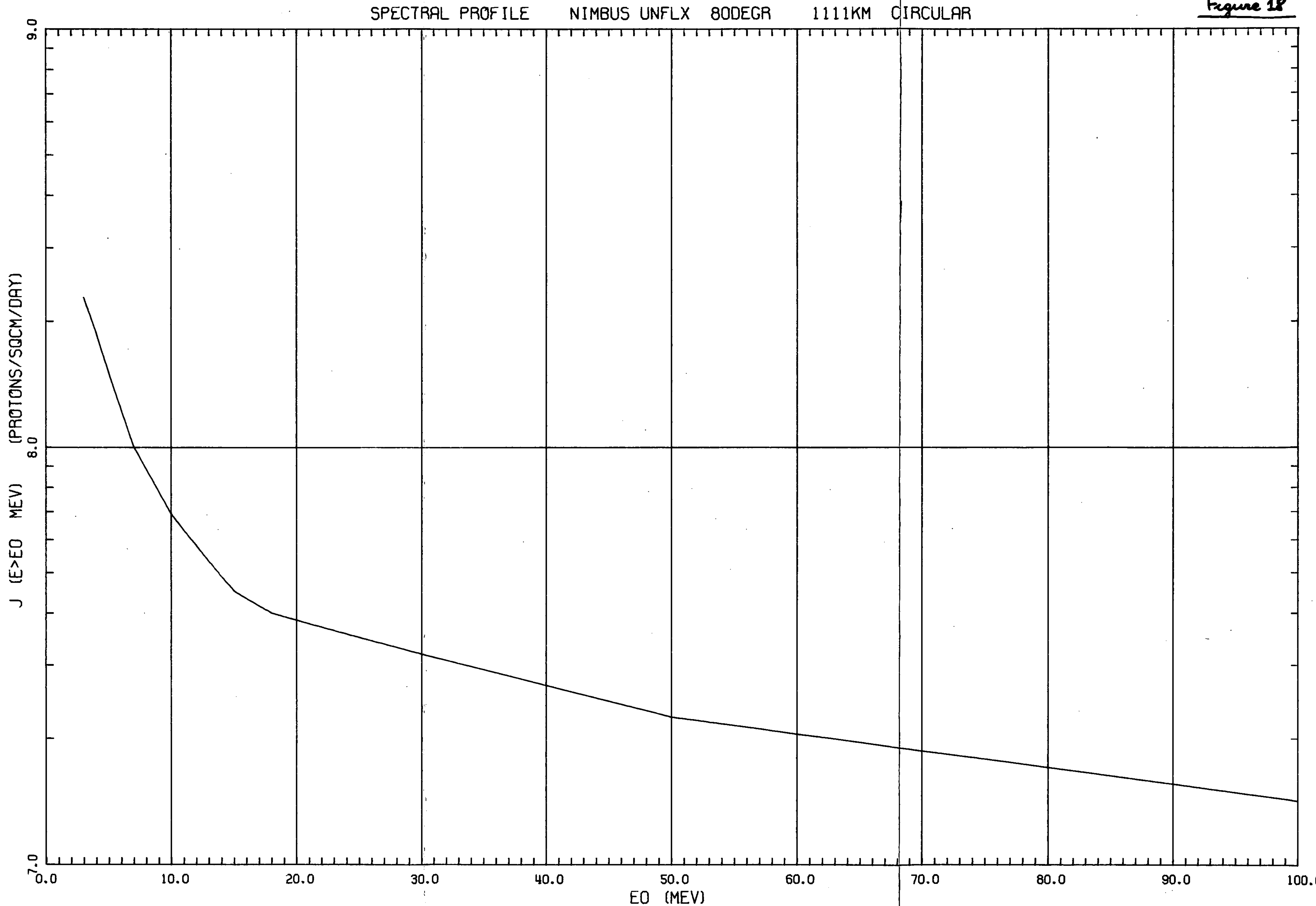

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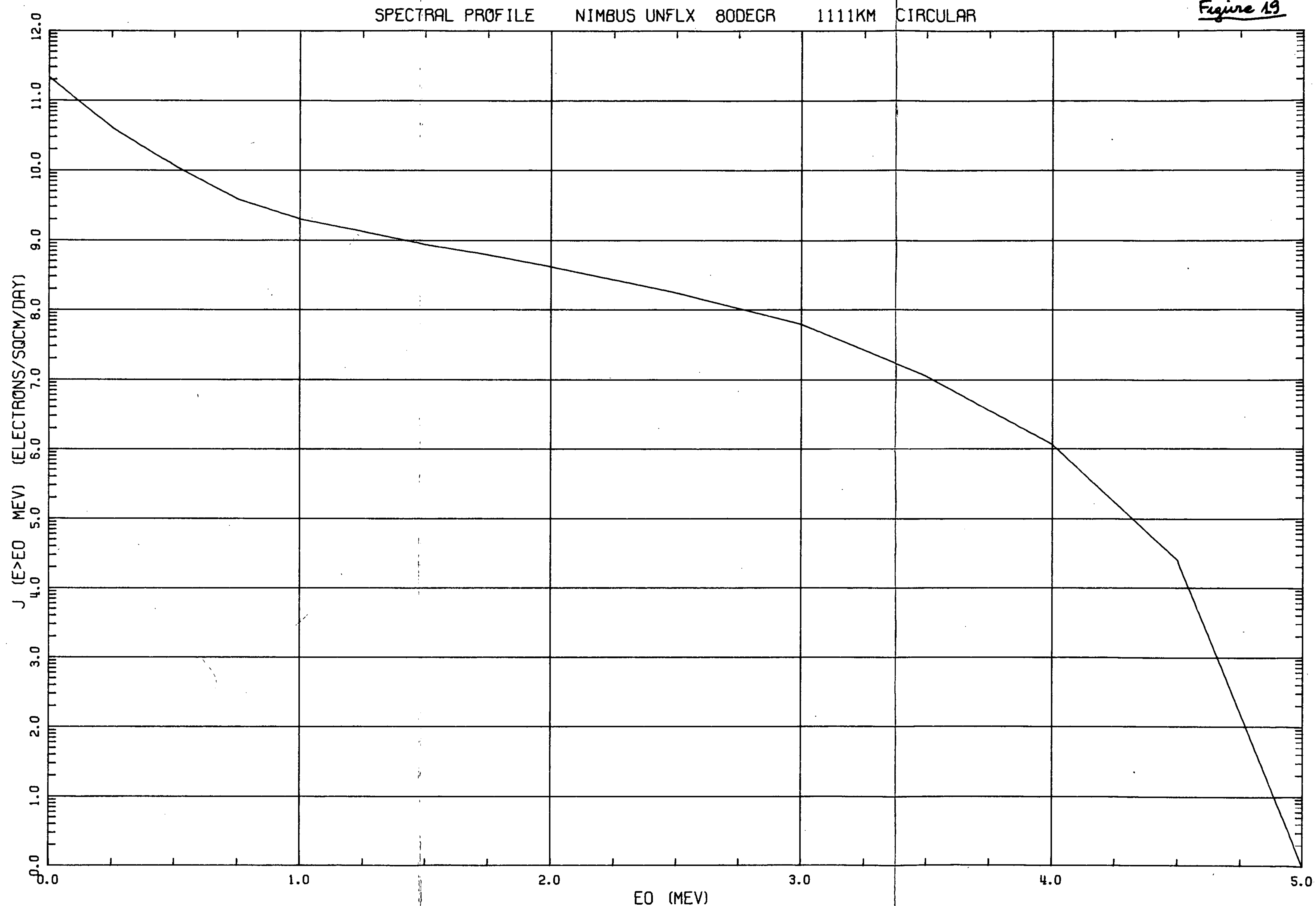
Figure 19



FOLDOUT FRAME 1

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Figure 20

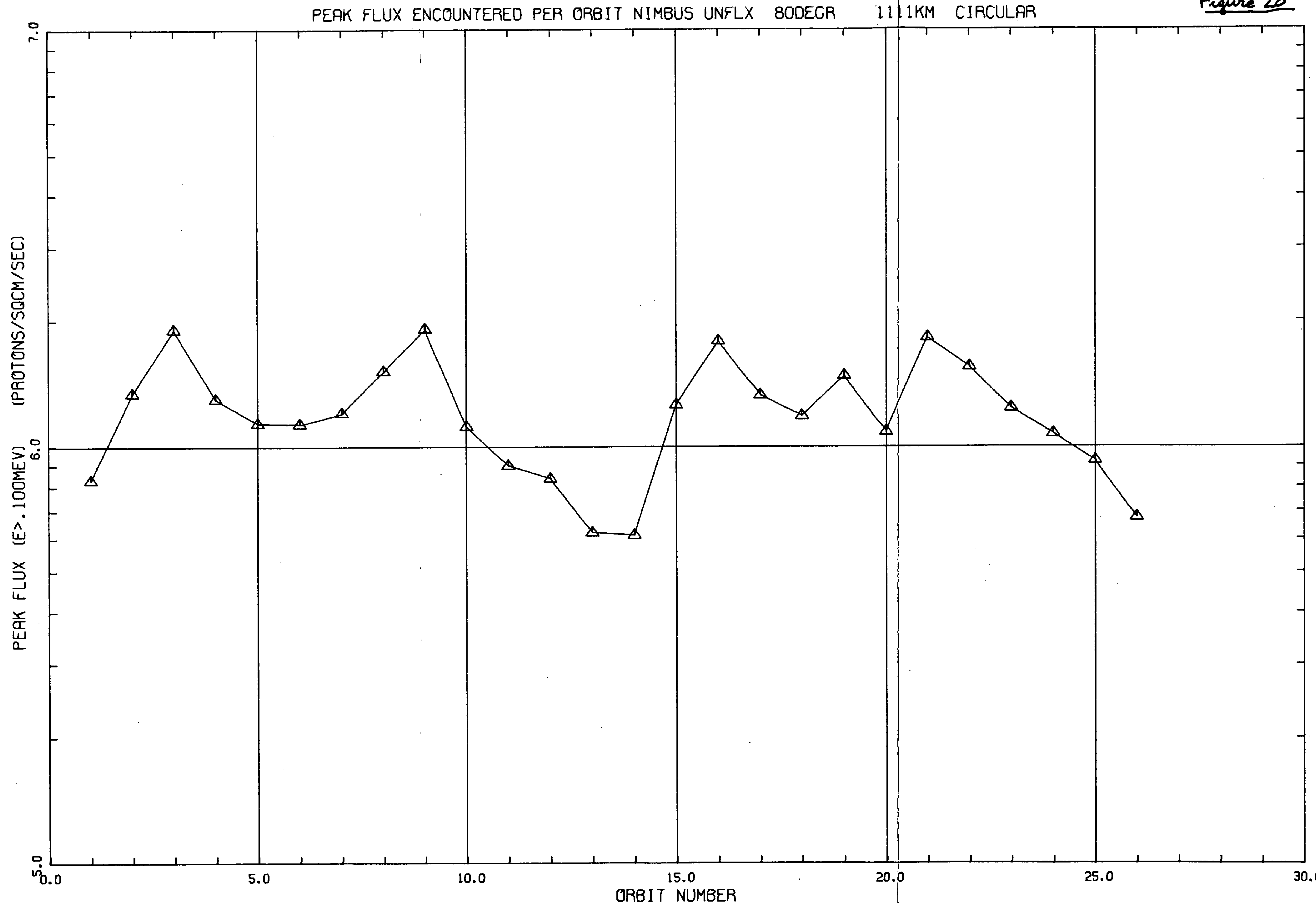

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Figure 21

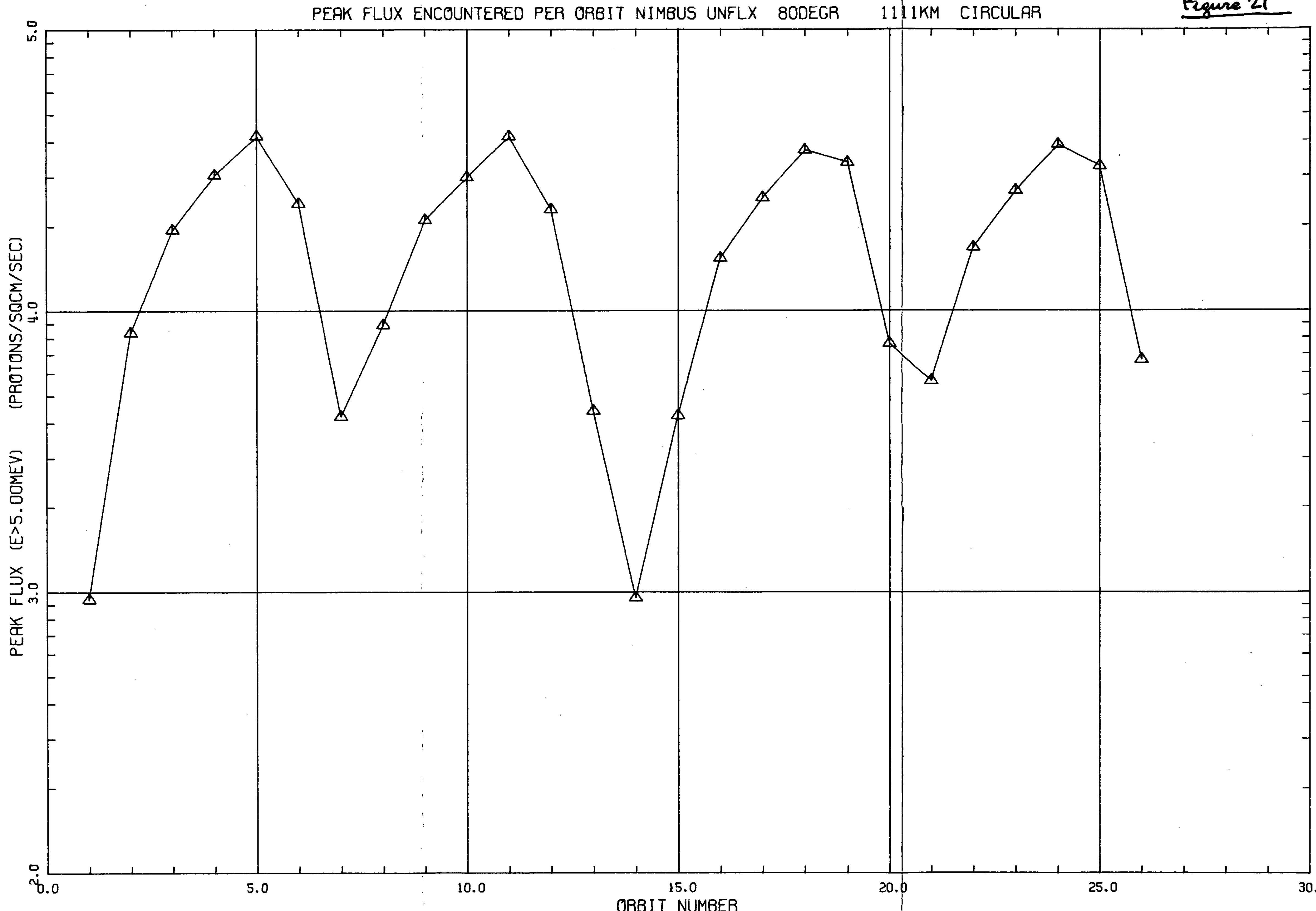

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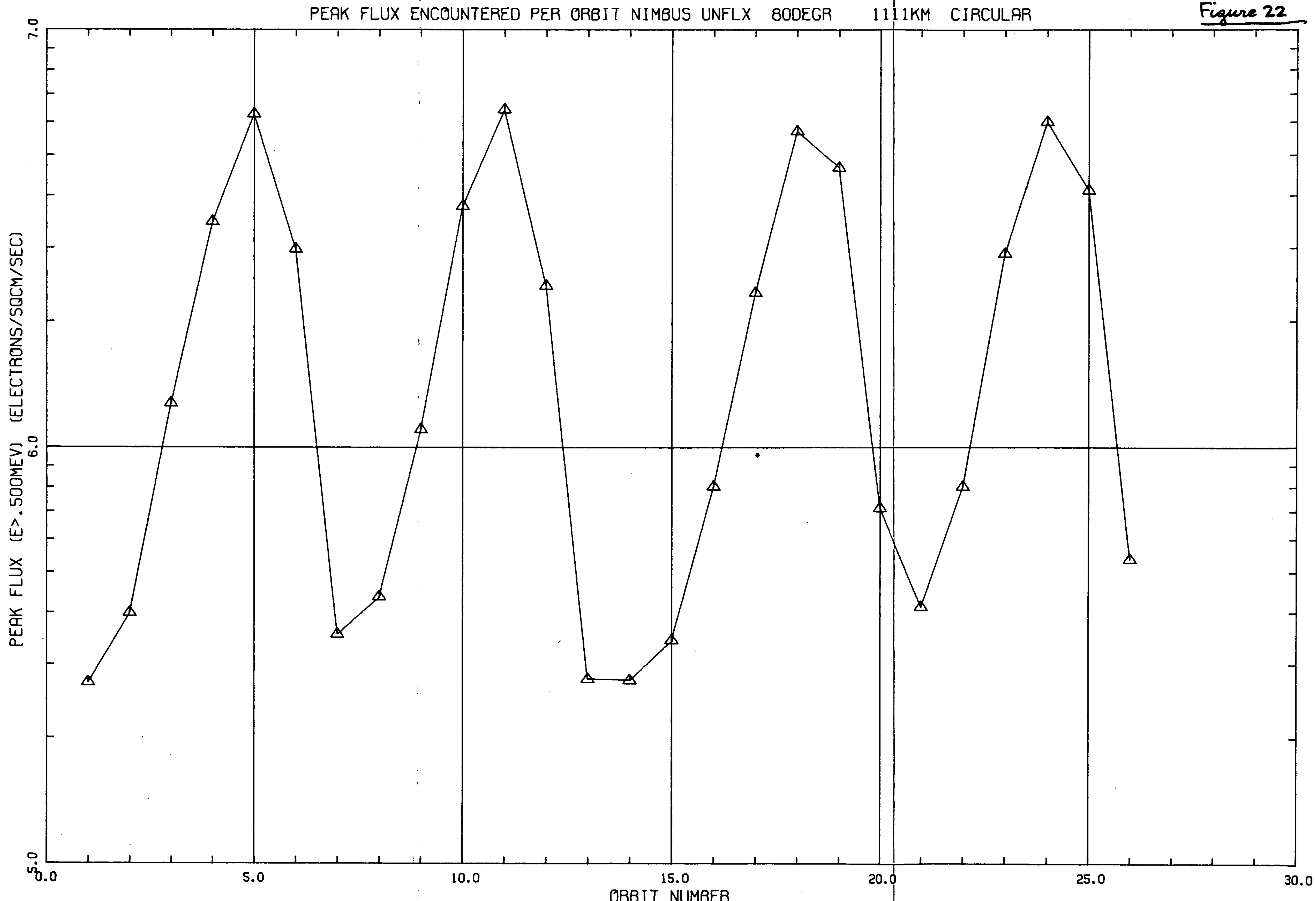
Figure 22



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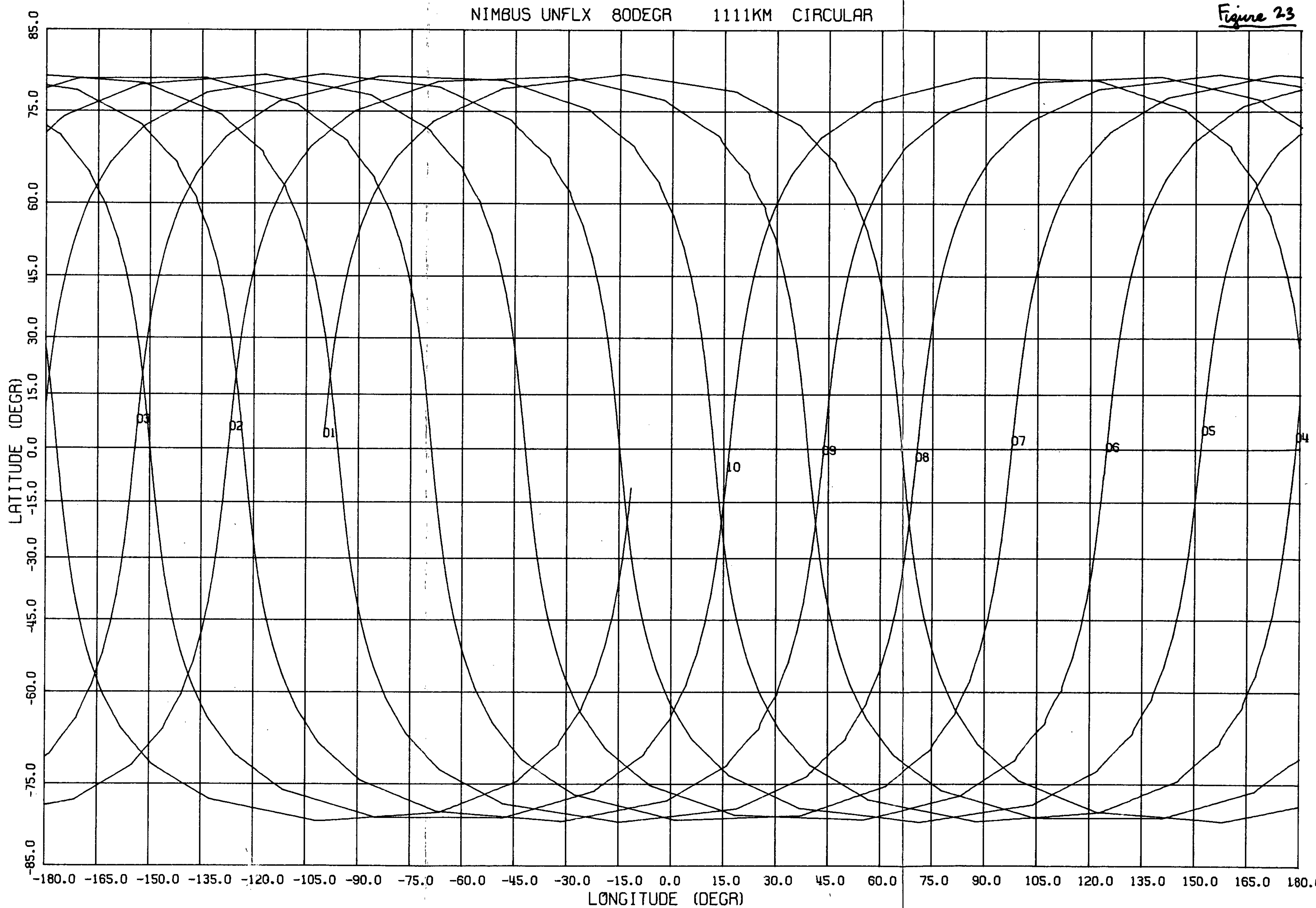

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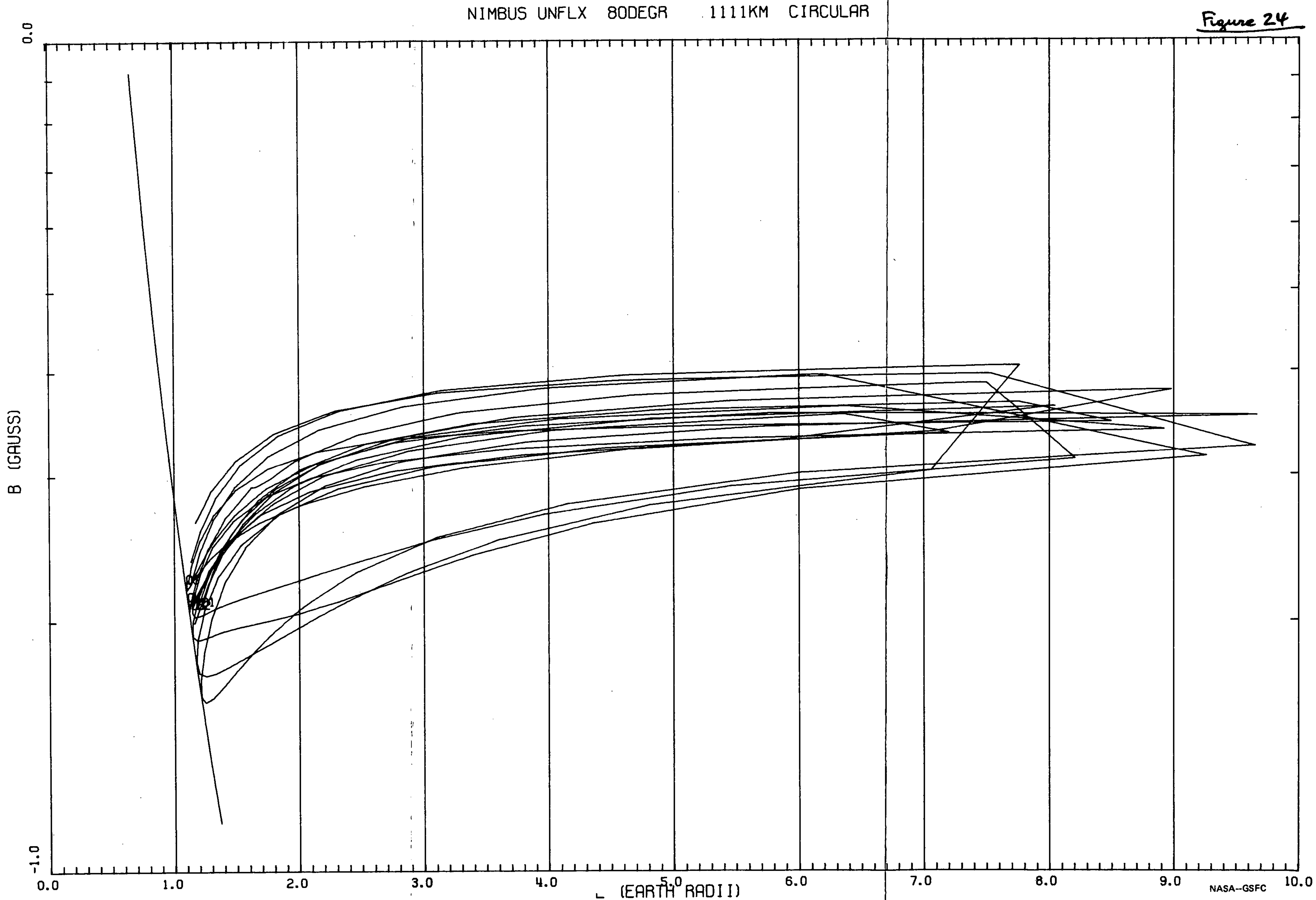
Figure 24



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