National Space Science Data Center/
World Data Center A For Rockets and Satellites

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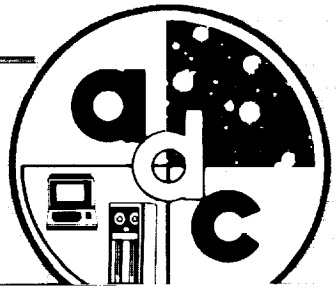
AN ATLAS OF STELLAR SPECTRA BETWEEN 2.00 AND 2.45 MICROMETERS

(Arnaud, Gilmore, and Collier Cameron 1989)

Documentation for the Machine-Readable Version



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Abstract

The machine-readable version of the atlas, as it is currently being distributed from the Astronomical Data Center, is described. The atlas represents a collection of spectra in the wavelength range 2.00 to 2.45 μm having a resolution of approximately 0.02 μm. The sample of 73 stars includes a supergiant, giants, dwarfs, and subdwarfs with a chemical abundance range of about -2 to $+0.5$ dex.

Table of Contents

List of Tables

1.0 Introduction

1.1 Description

An Atlas of Stellar Spectra between 2.00 and 2.45 micrometers (Arnaud, Gilmore, Collier Cameron 1989) contains digital spectra for a sample of 73 stars of various temperature classes of F and later, most luminosity classifications, and a range of abundances. A majority of the spectra were obtained with the UKIRT, while some observations were collected with the Mount Hopkins MMT. The UKIRT provided a 59-point spectrum from 2.004 to 2.451 μm and the MMT gave a 30-point spectrum from 2.001 to 2.431 μm.

This documentation describes the machine-readable version of *An Atlas of Stellar Spectra between 2.00 and 2.45 micrometers* as it is currently being distributed from the international network of astronomical data centers. It is intended to enable users to read and process the data without problems and guesswork, and it should be used only to supplement the information contained in the source reference, which should be consulted for details regarding the impetus for the work, the selection of standard stars, the observational procedures, and the technique of data reduction. The source reference also contains a full listing of the observed stars and a table of flux standards used. Graphical presentations of all spectra are also given in the body of the paper, while the digital spectra are listed on a microfiche card accompanying the journal issue. (**Note: The labels on the two microfiche cards in the issue are reversed.**) In any case, the published paper should be consulted by all users of the machine-readable data. **A copy of this document should be transmitted to any recipient of the machine-readable catalog originating directly from the data centers.**

1.2 Source Reference

Arnaud, K. A., Gilmore, G., and Collier Cameron, A. 1989, *An Atlas of Stellar Spectra between 2.00 and 2.45 micrometers*, *Mon. Not. Royal Astron. Soc.* **237**, 495-511.

2.0 Structure

2.1 File Summary

The machine version of *An Atlas of Stellar Spectra between 2.00 and 2.45 micrometers* consists of a single data file. Table 1 gives the machine-independent file attributes. All logical records are of fixed length, and, if the atlas is received on magnetic tape, it will contain blocks of fixed length (as noted below) except that the last block of the file may be short.

An Atlas of Stellar Spectra between 2.00 and 2.45 micrometers (Arnaud, Gilmore, Collier Cameron 1989)				
File	Contents	Record Format	Logical Record Length	Total Number of Logical Records
1	Data	FB	20	4385

Table 1. Summary Description of Catalog Files: FB = Fixed length blocks (last may be short)

The information contained in the above table is sufficient for a user to describe the indigenous characteristics of the machine-readable version of *An Atlas of Stellar Spectra between 2.00 and 2.45 micrometers* to a computer. Information easily varied from installation to installation, such as block size (physical record length), blocking factor (number of logical records per physical record), total number of blocks, density, number of tracks and character coding (ASCII, EBCDIC) for tapes, is not included, but should always accompany secondary copies if any are supplied to other users or installations.

2.2 *Catalog (File 1 of 1)*

The file contains all spectral data in contiguous logical records. Each spectrum begins with one header record giving the star and telescope identifications, and ends with a blank record; thus, each full spectrum can be read with a single Fortran DO loop that tests for a zero wavelength.

Table 2 gives a byte-by-byte description of the contents of the data records. A suggested Fortran format specification for reading each data field is included and can be modified depending upon individual programming and processing requirements (Fortran 77 character string-type formats are used throughout). The header record must be read with a separate format specification (A20 can be used) and is not described in the table. All data fields contain valid data, so there are no default (null) values given.

Byte(s)	Units	Suggested Format	Default Value	Data
1-5	μm	F5.3	---	Wavelength
6-7	---	2X	---	Blank
8-12	---	F5.3	---	Flux
13-14	---	2X	---	Blank
15-20	---	F6.4	---	Fractional error

Table 2. Data File Record Format

Wavelength Wavelength (λ) of the data point expressed in μm.

Flux Relative flux, normalized to unity at $\lambda = 2.15$ μm.

Fractional error Fractional (1σ) error of the observed flux.

3.0 History

3.1 Remarks and Modifications

The machine-readable version of *An Atlas of Stellar Spectra between 2.00 and 2.45 micrometers* was received on 3 November 1989 via SPAN network transfer from Dr. K. A. Arnaud of the Laboratory of High Energy Astrophysics at the NASA Goddard Space Flight Center. Minor changes were made to some of the header records in order to make the spacing uniform; otherwise, the archived and distributed data are exactly as received.

4.0 Acknowledgments and Reference

4.1 Acknowledgments

Appreciation is expressed to Dr. Keith Arnaud for supplying the digital spectra and for reviewing a draft copy of the present document before it was finalized for distribution with the machine-readable atlas.

4.2 Reference

Arnaud, K. A., Gilmore, G., and Collier Cameron, A. 1989, *An Atlas of Stellar Spectra between 2.00 and 2.45 micrometers*, *Mon. Not. Royal Astron. Soc.* **237**, 495-511.

Appendix A. Sample Listing

The sample listing given on the following pages shows logical records exactly as they are recorded in the machine-readable version of the atlas. Groups of records from the beginning and end of the file are illustrated. The beginning of each record and the bytes within the record are indicated by the column heading index across the top of each page (digits read vertically).

L I S T I N G O F R E C O R D S F R O M D A T A F I L E

Data File Name: Spectra 2.00-2.45 um
Records 1 to 20
Data File 117
Record Length 20 bytes
Input VOLSER ADC003

```
C O L U M N
H E A D I N G
I N D E X      1111111111222222222233333333334444444444555555555566666666667777777777888888888999 9
               12345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123
```

Record	1	BS3546	(UKIRT 86)	
Record	2	2.001	1.263	0.0108
Record	3	2.009	1.269	0.0090
Record	4	2.017	1.278	0.0270
Record	5	2.024	1.250	0.0200
Record	6	2.032	1.227	0.0148
Record	7	2.040	1.200	0.0073
Record	8	2.047	1.186	0.0052
Record	9	2.055	1.174	0.0037
Record	10	2.063	1.159	0.0037
Record	11	2.071	1.145	0.0066
Record	12	2.078	1.133	0.0060
Record	13	2.086	1.119	0.0048
Record	14	2.094	1.103	0.0065
Record	15	2.101	1.087	0.0063
Record	16	2.109	1.069	0.0059
Record	17	2.117	1.055	0.0078
Record	18	2.125	1.042	0.0090
Record	19	2.132	1.031	0.0038
Record	20	2.140	1.019	0.0023

L I S T I N G O F R E C O R D S F R O M D A T A F I L E

Data File Name: Spectra 2.00-2.45 um
Records 4366 to 4385
Data File 117
Record Length 20 bytes
Input VOLSER ADC003

```
COLUMN
HEADING          1111111111222222222233333333334444444444555555555566666666667777777777888888888999
INDEX    12345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123
```

Record	4366	2.305	0.898	0.0017
Record	4367	2.313	0.886	0.0026
Record	4368	2.320	0.809	0.0038
Record	4369	2.328	0.805	0.0035
Record	4370	2.336	0.806	0.0048
Record	4371	2.343	0.792	0.0037
Record	4372	2.351	0.771	0.0031
Record	4373	2.359	0.756	0.0048
Record	4374	2.366	0.743	0.0044
Record	4375	2.374	0.730	0.0025
Record	4376	2.382	0.715	0.0036
Record	4377	2.397	0.756	0.0048
Record	4378	2.405	0.743	0.0044
Record	4379	2.413	0.730	0.0025
Record	4380	2.420	0.715	0.0036
Record	4381	2.428	0.700	0.0049
Record	4382	2.436	0.691	0.0037
Record	4383	2.444	0.684	0.0043
Record	4384	2.451	0.675	0.0025
Record	4385			