Final Report

A Complete UV Atlas of Standard Stars

Contract S-57791-Z

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Contents

1. Project Summary

The general objective of this project is to provide a comprehensive ultraviolet spectral atlas of stars based on the data in the IUE Final Archive. The atlas and the project information are presented on our web site.

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http://sol.stsci.edu/~jinger/iue.html
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It links to the Multi-Mission Archive at the Space Telescope Science Institute (MAST). Users can also access this site through

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http://archive.stsci.edu/prep_ds.html.
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The data have been uniformly processed by the IUE NEWSIPS pipeline system. The NEWSIPS gives an improved signal to noise ratio for the data that will be especially beneficial to low signal portions of the spectra; and it also gives more accurate fluxes for stars by adopting the latest absolute calibration and measured instrument parameters. Our new atlas, therefore, provides more uniform and accurate data than the version previously published.

In addition, considerable efforts were devoted to obtain reliable spectral types, V, B-V, and E(B-V). Our goal is to provide the information which can be used with reasonable confidence by scientists.

This comprehensive ultraviolet spectal atlas consists of two sub-atlases. One for "normal" stars, and the other for subluminous stars. The stars in each subgroup are listed in two tables, one sorted by spectral type and the other by HD number or RA (Right Ascension).

- Standard Star Atlas : 476 "normal" stars.
  - o Standard Star Atlas, sorted by Spectral Type
  - o Standard Star Atlas, sorted by HD Number
- Subluminous Star Atlas : 38 subdwarfs and white dwarfs.
  - o Subluminous Stars Atlas, sorted by Spectral Type
  - o Subluminous Stars Atlas, sorted by Right Ascension

The graphics (plots) and flux-wavelength tables of the stars can be accessed via our web page. For each observation, the output resulted from our data reduction includes a pair of spectral graphics, a gif file and a ps (PostScript) file and a w_f (wavelength_flux) text table. A combined spectrum is available, if the observation is a Double Aperture Exprosure or the star has more than two observations.

The applications software, a new MXLO data reduction tool has been developed for our project under the IRAF (Image Reduction and Analysis Facility) environment. It facilitates reducing and analyzing data, generating the graphics and wavelength_flux table for MXLO spectra, retrieving information from various related catologues, and so on. This software is available upon request.

2. Obervations and Data Retrieval

The observations, assembled here, were done mostly by Wu and his collaborators. Only a small number of images were taken from the IUE calibration programs and the other Guest Observers. The observations provide a reasonably comprehensive coverage of the HR diagram. The distribution of the "normal" stars in the atlas is shown in Table I.

The IUE NEWSIPS Low-Dispersion Merged Extracted Image (MXLO) were retrieved from the IUE Final Archive supported by the Multi-Mission Archive at STScI (MAST).

The features of the NEWSIPS MXLO Data are listed below.

- **FITS Table**
  The IUE NEWSIPS MXLO file is a 3-D FITS table, a binary table with fixed-length floating point vectors to contain the extracted fluxes and associated flags.

- **Data Points**
  The number of extracted points is always 640. Vacuum ultraviolet wavelength are linearly sampled to a uniform step size.

- **Aperture**
  Double aperture low-dispersion spectra will contain two rows, with one row for each aperture.

- **Absolute Calibration**
  It converts to absolute fluxes in the range of 1150-1980 Å for short-wavelength spectra and 1850-3350 Å for long-wavelength spectra.

- **Data Quality Flags**
  These flages indicate abnormal conditions in the data which can range from fairly minor to quite serious situations. The flags for the MXLO data should be examined carefully in order to ascertain whether or not a particular data point is good or bad. A flag value of zero indicates that there is no know problem associated with the data. In general, flag values of -8 or more negative are indicative of unreliable data.

- **Small Aperture Spectra**
  The absolute fluxes for small-aperture data are significantly less reliable than those of large-aperture data. Because centering errors in the small aperture can lead to large variations in the overall observed flux level for individual spectra, it is impossible to determine an absolute small aperture/large aperture ratio (S/L). Therefore, the average of S/L over all wavelengths is normalized to unity. *As a result, the small-aperture fluxes are known in a relative sense but not in an absolute one.*

Table I. The Distribution of Atlas Stars in Spectral Types and Luminosity Classes

O Stars	VI	V	IV	III	II	Ib	Iab	Ia	If	In	m
3		2									
4		2									
5		1		3							
6				2					1	1	
6.5								1			
7		1		2	2						
7.5				2	1			1			
8		2						2			
8.5		1					1				
9		1	1								
9.5		2		2		1	1	1			
9.7							1				

B Stars	VI	V	IV	III	II	Ib	Iab	Ia	If	In	m
0		1		1	1	1					
0.5		1	1	3		1		1			
1		3		2	3	3	2	1			
1.5		2	2	3							
2		2	3	3	1	1		1			
2.5		4	1	2		1					
3		4	2	1	1		1	1			
4		3	2	3							
5		3	2	3	1	2		1			
6		3	2	2		1		1			
7		4		1							
7		1		2	2						
8		2		4	1						
9		2	2	1			2	1			
9.5		5		1							

A Stars	VI	V	IV	III	II	Ib	Iab	Ia	If	In	m
0		4	1	2	1	1		1			
1		5	1					1			1
2								1			
3		6		2	1						1
4		1									
5		2	1	1	1	1					
6			1					1			
7		1	4		1						
8		1				1					
9				1							

F Stars	VI	V	IV	III	II	Ib	Iab	Ia	If	In	m
0		2	1	2		1					
1				2	2						
2		2	1	3		1		1			
3		2	1	2				2			
4		2	2	2							
5	1	6	2	2		2					
6		7	3	1		1					
7		7	2			2					
8		6	4			2	1	1			
9		7									

G Stars	VI	V	IV	III	II	Ib	Iab	Ia	If	In	m
0		10	4	2	1	2					
1		5	1		1	1					
2		8	1			2		1			
3		2			1	1					
4				2	1	1					
5		5	1	2	1	1					
6		2									
7				2							
8		7	3	7	1	1					
9				3	1						

K Stars	VI	V	IV	III	II	Ib	Iab	Ia	If	In	m
0		4	1	11		2					
1		3	3	2	1	1					
2		2	1	9	3	1					
3		2		4	2	1					
4				4		1					
5		1		3			1				
7		1		4		1					

M Stars	VI	V	IV	III	II	Ib	Iab	Ia	If	In	m
0				4							
0.5		1		1							
1		2									
2				4		1		1			
3		1		4	1						
3.5				1							
4					2						
4.5				2							
5				1							
6				1							
7				1							

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3. Data Reduction with A New IRAF Tool

We assumed that the IUE MXLO data have been well-calibrated by the IUE NEWSIPS pipline. And no additional calibration for MXLO data is made by this project.

The run sequence to genaerate the spectral plots and flux tables is :

- **Convert Data Format**
  - convert the **IUE** spectra from the **MXLO** format to the 3D FITS STSDAS table formats
  - convert 3D FITS table to 2D STSDAS table, including the following table columns.
    * w : wavelength
    * fL : flux of large aperture image
    * fS : flux of small aperture image
    * qL : data quality flag for large aperture image
    * qS : data quality flag for small aperture image
    * fLSc : averge combined flux of the large aperture and the scaled small aperture
    * qLSc : data quality flag for the averge combined image

- **Make Spectra**
  - wavelength ranges :
    * LWR : 1850 - 3200 Å
    * LWP : 1850 - 3200 Å
    * SWP : 1150 - 1980 Å
  - extract ralated information from image header and transfer it to graphics and tables.
  - make flux table
  - make graphics
  - combine images: utilized the STSDAS gcombine as a basic task to make image combine/merge. See *Image Combine* section in our web site for algorithms and parameter specifications. For the atlas, selected high quality spectra of a star were merged to increase the S/N, and to repair spectral regions contaminated by reseaux, cosmic ray hits and other blemishes.
    * Large Aperture Spectra
    * Double (Large and Small) Aperture Spectra

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4. Atlas and Spectra of the UV Standard Stars

- **Atlas**

  This section gives the information for individual stars, including the HD number, star name, spectral type and luminosity class, reference key number for spectral_type and the luminosity_class, RA (Right Ascension) and Dec (Delination), V magnitue, remarks, B-V, and E(B-V).

- **UV Spectra**

  This section presents the **Spectral Plots** and **Flux Tables** of the UV spectra of the IUE Standard Stars. The information for the star, appeared on the top of the page, is transferred from the Atlas section.

  For each observation, the output of the data reduction includes a pair of spectral graphics (a gif file and a ps file) and a w_f (wavelength_flux) text table. Users can access these files by pointing to any of the (gif), (ps) or (w_f) files.

- **Description of the MXLO Image Log**
  - Image : camera(LWR/LWP/SWP) plus image sequence number
    * (gif) - graphics of mxlo spectrum in GIF format
    * (ps) - graphics of mxlo spectrum in PostScript format
    * (ps) - graphics style (color, pattern, and marker)

MXLO Data	Large Aperture Spectra	Small Aperture Spectra
Spectra	Black Solid Line	Violet Dashed Line
Bad Data Points	Red Cross	Blue Asterisk

  - (w_f) - mxlo wavelength_flux table in ASCII text format
    * w : wavelength
    * fL : flux of large aperture image
    * qL : DQF for large aperture image
    * fS : flux of small aperture image
  - Ap : aperture (Large/Small)
  - N : number/T
    * number - the number of exposures along the major axis of the large aperture
    * T - trail mode observation
  - Exp : exposure time in seconds
  - E/C/B : DN (Data Number) level of E/C/B, comments by the IUE staff
    * E - maximum Emission
    * C - maximum Continuum

* B - mean Background

- **Combined Image**
  - Single Aperture Exprosure & Double Aperture Exprosure
    * Single Aperture Exprosure :
    A weighted combined spectrum is given for each camera, if two or more Large Aperture images are available. The weighting factor is the total exposure time.
    * Double Aperture Exprosure :
    The "pixel-wise" weighting scheme is adopted when combining the Large Aperture(LAp) and the Small Aperture(SAp) data. The weight of a data point is the reciprocal of the variance sigma(i)**2 at that pixel. The sigma is the scaled error taken from the input error map.
    - For LAp : error map = sqrt (sL)
    - For SAp : error map = sqrt (sS * med)

    where sL and sS is the MXLO "sigma" spectrum for LAp and SAp, respectively. The "med" is the median scaled factor of fL/fS over the selected range. And the "sqrt" here is the square root oprator. The image scaling must be done prior to the image combining stage, since only the relative fluxes are available for small aperture.

  - Description of the Combined Image Log
    * (gif) - combined spectrum in GIF format
    * (ps) - combined spectrum in PostScript format
    * (w_f) - combined wavelength_flux table in ASCII text format

Table Column	Single Aperture Spectra	Double Aperture Spectra
wavelength	w	w
flux (of combined spectra)	fcomb	fLSc
DQF (of combined spectra)	qcomb	qLSc

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5. Web Site

The contents of the web site of this project is given below. It links to the Multi-Mission Archive at the Space Telescope Science Institute (MAST). Users can also access this site via MAST at

`http://archive.stsci.edu/prep_ds.html`

Project Information

- **About This Project**
- **Observations**
  - **"Nornal" stars**
  - **Star Spatial Distribution**
  - **Star Spectral Type Distribution**
- **Data Reduction**
  - **MXLO Data**
  - **New IRAF Tools**
  - **Image Combine**
- **Final Products: Catalogues and Spectra**
  - **Atlas**
  - **UV Spectra**
- **Acknowledgment**

IUE NEWSIPS Atlas

- Standard Star Atlas : 476 "normal" stars
  - o Standard Stars Atlas, sorted by Spectral Type
  - o Standard Stars Atlas, sorted by HD Number
- Subluminous Star Atlas : 38 subdwarfs and white dwarfs
  - o Subluminous Stars Atlas, sorted by Spectral Type
  - o Subluminous Stars Atlas, sorted by Right Ascension

IUESIPS Atlas Addendum I & II

- Atlas Addendum I (service provided by NASA/GSFC ADF)
- Atlas Addendum II (service provided by STScI)

Related Publications & IUE Links

- Related Publications
- IUE Archive at STScI
- NASA ADF IUE
- ESA IUE

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6. Related Publications

- Wu,C.-C., Mo,J., Schiffer,F.H.,III, & Crenshaw,D.M.
  1998, "*Ultraviolet Astrophysics Beyond the IUE Final Archive*",
  ESO Conference and Workshop Proceedings SP-413, pp.751-753.
  "A Comprehensive Ultraviolet Spectral Atlas of Standard Stars"

- Wu,C.-C., Schiffer,F.H.,III, & Crenshaw, D.M.
  1997, submitted to NASA *IUE* Newsletter
  "The IUE Ultraviolet Spectral Atlas, Addendum II"

- Wu,C.-C., Reichert,G.A., Ake,T.A., Crenshaw,D.M., Holm,A.V.,
  Imhoff,C.L., Kondo,Y., Mead,J.M., & Shore,S.N.
  1992, NASA Reference Publication 1285.
  "International Ultraviolet Explorer (IUE) Ultraviolet Spectral
  Atlas of Selected Astronomical Objects"

- Wu,C.-C., Crenshaw,D.M., Blackwell,J.H., Jr.,Wilson-Diaz,D.,
  Schiffer,F.H.,III, Burstein,D., Fanelli,M.N., & O'Connell,R.W.
  1991 NASA *IUE* Newsletter, No. 43.
  "IUE Ultraviolet Spectral Atlas, Addendum I"

- Wu, C.-C., Ake, T.A., Boggess, A., Bohlin, R.C., Imhoff, C.L.,
  Holm, A.V., Levay, Z.G., Panek, R.J., Schiffer, F.H., III,
  & Turnrose, B.E.
  1983, NASA *IUE* Newsletter, No. 22.
  "The IUE Ultraviolet Spectral Atlas"

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8. Appendix:

- The Atlas of Stars (sorted by spectral type)

- Example of Spectra

O4	V((f))	HD 164794
O9.5	V	HD 93027
B5	V	HD 188665
A5	Ib	HD 59612
F0	III	HD 7312
F8	V	HD 193901
G2	IV	HD 2151
K0	IIIb	HD 62509
M0.5	III	HD 14651

- **Color Print : The Spatial Distribution of the 476 Normal Stars in the Atlas**

IUE Ultraviolet Spectral Atlas of Standard Stars

CSC Computer Sciences Corporation

IUE NEWSIPS Atlas : Atlas of the 476 Normal Stars, sorted by Spectral Type

* O * B * A * F * G * K * M *

HD	Name	Sp_Type	Ref	RA(1950.0) hh:mm:ss	DEC(1950.0) dd:mm:ss	V mag	Remarks	B-V mag	E(B-V) mag
			--- O Stars ---						
93250		O3 V((f))	5	10:42:48.3	-59:18:07	7.37		0.17	0.49
303308		O3 V((f))	4	10:43:48.0	-59:24:18	8.16	H	0.13	0.45
46223		O4 V((f))	5	6:29:29.9	4:51:38	7.27		0.22	0.54
164794	9 SGR	O4 V((f))	4	18:00:48.4	-24:21:48	5.97		0.03	0.35
93204		O5 V((f))	4	10:42:31.0	-59:28:36	8.44	B	0.10	0.42
93403		O5 III(f) Var	4	10:43:46.7	-59:08:39	7.27		0.22	0.54
93632		O5 III(f) Var	4	10:45:15.5	-59:49:59	8.36	A	0.30	0.62
93843		O5 III(f) var	4	10:46:40.2	-59:57:33	7.32		-0.04	0.28
93130		O6 III(f)	5	10:42:04.4	-59:36:41	8.06	A	0.23	0.55
93160		O6 III(f)	5	10:42:10.7	-59:18:44	7.82	AB	0.17	0.49
169582		O6 If	4	18:22:57.9	-9:46:57	8.70		0.55	0.87
210839	LAM CEP	O6 I(n) fp	4	22:09:48.6	59:10:02	5.05		0.24	0.56
152723		O6.5 III(f)	5	16:53:26.1	-40:26:03	7.21	AB	0.13	0.45
163758		O6.5 Iaf	4	17:56:06.0	-36:01:06	7.32		0.03	0.35
47839	15 MON	O7 V((f))	5	6:38:13.4	9:56:37	4.65	AB	-0.24	0.08

93222		O7	III((f)	5	10:42:40.4	-59:49:41	8.10		0.05	0.37
101205		O7	IIIn((f))	4	11:35:59.8	-63:05:45	6.46	AB	0.04	0.36
151515		O7	II(f)	5	16:46:17.1	-41:54:57	7.17		0.16	0.48
167659		O7	II(f)	4	18:14:01.9	-18:59:12	7.38		0.21	0.53
24912	XI PER	O7.5	III(n)((f))	5	3:55:42.8	35:38:56	4.04		0.02	0.33
203064	68 CYG	O7.5	III:n((f))	5	21:16:35.1	43:44:05	5.00		-0.03	0.28
162978		O7.5	II((f))	5	17:51:49.2	-24:52:44	6.20		0.04	0.35
188001	9 SGE	O7.5	Iaf	5	19:50:07.8	18:32:31	6.24		0.01	0.33
14633		ON8	V	5	2:19:46.4	41:15:11	7.46	A	-0.20	0.11
46056		O8	Vn	4	6:28:41.5	4:52:14	8.24	A	0.20	0.51
151804		O8	Iaf	5	16:48:04.1	-41:08:47	5.23		0.07	0.36
152408		O8:	Iafpe	5	16:51:28.8	-41:04:15	5.79	AB	0.16	0.45
46149		O8.5	V	4	6:29:12.9	5:04:11	7.60		0.17	0.48
112244		O8.5	Iab(f)	4	12:52:59.4	-56:33:54	5.37	A	0.02	0.31
214680	10 LAC	O9	V	1	22:37:00.7	38:47:22	4.88	A	-0.20	0.11
57682		O9	IV	5	7:19:38.1	-8:53:00	6.42		-0.19	0.12
38666	MU COL	O9.5	V	4	5:45:00.5	5:40:45	5.17		-0.28	0.02
93027		O9.5	V	5	10:41:18.3	-59:52:40	8.72		-0.02	0.28
112784		O9.5	III	8	12:57:02.1	-60:19:26	8.26		0.06	0.36
152247		O9.5	II-III	4	16:50:40.9	-41:33:40	7.17		0.19	0.49
209975	19 CEP	O9.5	Ib	5	22:03:36.2	62:02:10	5.10	A	0.09	0.36
188209		O9.5	Iab	5	19:50:28.5	46:53:51	5.63		-0.07	0.20
30614	ALF CAM	O9.5	Ia	5	4:49:03.8	66:15:38	4.29		0.03	0.30
149038	MU NOR	O9.7	Iab	5	16:30:31.3	-43:56:28	4.90	V	0.09	0.35
				--- B Stars ---						
36512	UPS ORI	B0	V	1	5:29:30.6	-7:20:12	4.62		-0.26	0.04
63922		B0	III	7	7:47:42.8	-46:14:47	4.11	A	-0.19	0.11
43818		B0	II	9	6:16:16.6	23:29:27	6.91		0.29	0.58
204172	69 CYG	B0	Ib	6	21:23:44.2	36:27:02	5.93	A	-0.08	0.16
55857		B0.5	V	7	7:11:35.4	-27:16:10	6.11	V	-0.24	0.04
34816	LAM LEP	B0.5	IV	6	5:17:16.1	-13:13:37	4.29		-0.27	0.01
119159		B0.5	III	7	13:39:38.9	-56:30:58	6.00		-0.08	0.20
218376	1 CAS	B0.5	III	6	23:04:29.5	59:08:57	4.85		-0.03	0.25
219188		B0.5	III	9	23:11:27.9	4:43:28	7.05		-0.13	0.15
64760		B0.5	Ib	7	7:51:49.9	-47:58:18	4.24		-0.15	0.07
150898		B0.5	Ia	7	16:43:03.3	-58:15:06	5.57		-0.07	0.15
31726		B1	V	6	4:55:27.3	-14:18:27	6.14		-0.21	0.05
46106		B1	V	13	6:28:58.8	5:03:47	7.93		0.14	0.40
166197		B1	V	7	18:07:36.8	-33:48:39	6.15		-0.15	0.11
46328	XI1 CMA	B1	III	7	6:29:46.2	-23:22:52	4.33	A	-0.24	0.02
50707	15 CMA	B1	III	7	6:51:23.1	-20:09:40	4.82	V	-0.22	0.04
1383		B1	II	9	0:15:34.7	61:26:58	7.63		0.27	0.51

47240		B1	II	6	6:35:13.2	5:00:04	6.15		0.15	0.39
215733		B1	II	9	22:44:35.2	16:58:09	7.33		-0.13	0.11
40111	139 TAU	B1	Ib	6	5:54:53.4	25:56:58	4.82		-0.06	0.13
86606		B1	Ib	7	9:55:17.9	-71:09:02	6.33		-0.06	0.13
157246	GAM ARA	B1	Ib	7	17:21:10.7	-56:19:58	3.33	A	-0.14	0.05
13854		B1	Iab	6	2:13:20.9	56:49:26	6.47	A	0.28	0.47
91316	RHO LEO	B1	Iab	6	10:30:10.7	9:33:52	3.85	AB	-0.14	0.05
150168		B1	Ia	7	16:37:52.6	-49:33:21	5.65		-0.02	0.17
37744		B1.5	V	6	5:38:06.8	-2:51:00	6.21		-0.21	0.04
74273		B1.5	V	7	8:39:30.0	-48:44:36	5.90		-0.21	0.04
69081		B1.5	IV	7	8:12:05.5	-36:10:11	5.08	A	-0.20	0.05
83058		B1.5	IV	7	9:32:24.6	-51:01:56	5.00		-0.19	0.06
44506		B1.5	IIIn	7	6:18:47.6	-34:07:13	5.54		-0.19	0.06
62747		B1.5	III	7	7:42:27.8	-24:33:09	5.61		-0.20	0.05
74375		B1.5	III	7	8:39:30.8	-59:34:55	4.32	A	-0.12	0.13
64802		B2	V	7	7:52:19.7	-35:44:43	5.47		-0.19	0.05
122980	CHI CEN	B2	V	7	14:02:59.0	-40:56:27	4.35		-0.20	0.04
28873	DEL CAE	B2	IV-V	7	4:29:18.1	-45:03:36	5.06		-0.20	0.04
39291	55 ORI	B2	IV-V	6	5:48:57.0	-7:31:48	5.35		-0.20	0.04
3360	ZET CAS	B2	IV	6	0:34:10.3	53:37:19	3.66		-0.20	0.04
51283		B2	III	7	6:53:40.5	-22:52:32	5.30		-0.18	0.06
127381	SIG LUP	B2	III	7	14:29:14.0	-50:14:11	4.41		-0.19	0.05
148703		B2	III	7	16:28:06.5	-34:35:50	4.23		-0.17	0.07
14357		B2	II	9	2:17:38.4	56:38:14	8.52		0.32	0.53
165024	THE ARA	B2	Ib	7	18:02:44.2	-50:05:49	3.67		-0.09	0.07
41117	CHI2 ORI	B2	Ia	1	6:00:56.9	20:08:28	4.63		0.27	0.44
25631		B2.5	V	7	4:01:12.4	-20:16:50	6.46		-0.18	0.04
61831		B2.5	V	7	7:37:41.5	-38:11:32	4.84		-0.19	0.03
64503		B2.5	V	7	7:50:52.3	-38:43:56	4.49		-0.20	0.02
142096	LAM LIB	B2.5	V	6	15:50:25.6	-20:01:08	5.03		-0.02	0.20
32612		B2.5	IV	6	5:01:34.9	-14:26:19	6.40		-0.19	0.03
63465		B2.5	III	7	7:45:38.7	-38:23:11	5.08	AB	-0.11	0.11
166596		B2.5	III	7	18:09:40.1	-41:20:59	5.46		-0.18	0.04
31327		B2.5	Ib	6	4:52:59.4	36:05:25	6.07		0.40	0.55
32630	ETA AUR	B3	V	1	5:03:00.2	41:10:08	3.17		-0.18	0.02
66591		B3	V	7	7:59:42.3	-63:25:42	4.81		-0.17	0.03
120315	ETA UMA	B3	V	1	13:45:34.2	49:33:44	1.86		-0.19	0.01
190993	17 VUL	B3	V	6	20:04:44.3	23:28:08	5.07		-0.18	0.02
42560	XI ORI	B3	IV	6	6:09:05.7	14:13:18	4.47	A	-0.18	0.02
134687		B3	IV	7	15:09:27.3	-44:18:47	4.82		-0.18	0.02
79447		B3	III	7	9:10:08.6	-62:06:40	3.96		-0.19	0.01
24432		B3	II	13	3:51:45.7	48:53:42	6.93		0.58	0.75
225094		B3	Iab	6	0:00:50.7	63:21:46	6.24		0.33	0.46
53138	OMI2 CMA	B3	Ia	1	7:00:56.1	-23:45:32	3.03		-0.09	0.04

65904		B4	V	7	7:57:26.4	-45:04:43	5.98		-0.15	0.03
75112		B4	V	7	8:44:50.0	-34:26:19	6.36		-0.14	0.04
136664	PHI2 LUP	B4	V	7	15:19:57.1	-36:40:50	4.53		-0.15	0.03
48879	42 CAM	B4	IV	6	6:45:44.9	67:37:48	5.14		-0.17	0.01
202654		B4	IV	6	21:13:51.9	47:45:53	6.45		-0.16	0.02
170523	DEL2 TEL	B4	III	7	18:28:20.1	-45:47:37	5.07		-0.13	0.05
183144		B4	III	6	19:25:15.7	14:10:47	6.32		-0.07	0.11
195986		B4	III	6	20:31:07.8	43:01:12	6.59		-0.11	0.07
25340	35 ERI	B5	V	6	3:58:59.8	-1:41:18	5.28		-0.15	0.01
34759	RHO AUR	B5	V	1	5:18:15.8	41:45:24	5.22		-0.15	0.01
188665	23 CYG	B5	V	6	19:52:15.8	57:23:30	5.14		-0.14	0.02
23227	DEL FOR	B5	IV	7	3:40:15.4	-32:05:49	5.00		-0.17	-0.01
147394	TAU HER	B5	IV	1	16:18:14.1	46:25:53	3.90	AB	-0.15	0.01
4180	OMI CAS	B5	III	6	0:41:55.6	48:00:40	4.57	A	-0.07	0.09
76538		B5	III	7	8:52:40.1	-60:09:47	5.78		-0.08	0.08
209419		B5	III	6	22:00:00.4	52:38:26	5.78		-0.11	0.05
83183		B5	II	7	9:32:59.5	-59:00:21	4.08		0.01	0.15
86440	PHI VEL	B5	Ib	7	9:55:06.2	-54:19:44	3.53	A	-0.09	0.00
164353	67 OPH	B5	Ib	6	17:58:08.3	2:55:56	3.96	AB	0.02	0.11
58350	ETA CMA	B5	Ia	1	7:22:06.9	-29:12:16	2.45	A	-0.08	0.01
81848		B6	V	7	9:24:40.2	-53:09:41	5.10		-0.12	0.02
90994	BET SEX	B6	V	6	10:27:44.0	0:22:47	5.07		-0.14	0.00
115823		B6	V	7	13:17:34.6	-52:29:08	5.47		-0.13	0.01
23338	19 TAU	B6	IV	1	3:42:13.5	24:18:42	4.30	A	-0.11	0.03
79694		B6	IV	7	9:12:17.4	-43:56:17	5.85		-0.13	0.01
182255	3 VUL	B6	III	6	19:20:47.9	26:09:54	5.19		-0.12	0.02
195810	EPS DEL	B6	III	6	20:30:49.4	11:07:55	4.03		-0.12	0.02
125288		B6	Ib	7	14:16:48.9	-56:09:26	4.34		0.12	0.19
74371		B6	Ia	7	8:40:14.7	-45:13:50	5.24		0.21	0.28
17081	PI CET	B7	V	6	2:41:44.4	-14:04:10	4.24		-0.14	-0.01
17769	SIG ARI	B7	V	6	2:48:43.6	14:52:38	5.48		-0.09	0.04
29335	49 ERI	B7	V	6	4:34:38.8	0:53:54	5.31		-0.13	0.00
204770	7 CEP	B7	V	6	21:26:48.3	66:35:26	5.43		-0.11	0.02
23630	ETA TAU	B7	III	1	3:44:30.4	23:57:07	2.87	A	-0.09	0.03
23324	18 TAU	B8	V	1	3:42:10.3	24:41:02	5.65		-0.07	0.04
222173	IOT AND	B8	V	13	23:35:40.6	42:59:28	4.28		-0.10	0.01
10205	TAU AND	B8	III	13	1:37:37.0	40:19:28	4.95	A	-0.09	0.01
23850	27 TAU	B8	III	1	3:46:11.0	23:54:07	3.62	AB	-0.09	0.01
173300	PHI SGR	B8	III	13	18:42:32.0	-27:02:38	3.17		-0.11	-0.01
207971	GAM GRU	B8	III	13	21:50:54.4	-37:36:03	3.00		-0.12	-0.02
46769		B8	Ib	6	6:32:41.0	0:55:52	5.80		-0.01	0.01
21790	17 ERI	B9	Vs	10	3:28:08.0	-5:14:43	4.73		-0.09	-0.02
196867	ALP DEL	B9	V	2	20:37:18.8	15:44:04	3.77	A	-0.06	0.01
38899	134 TAU	B9	IV	2	5:46:44.3	12:38:13	4.90	A	-0.07	0.00

222439	KAP AND	B9	IVn	10	23:37:56.2	44:03:25	4.14	A	-0.07	0.00
26571		B9	III	13	4:09:53.1	22:17:11	8.09		0.19	0.27
202850	SIG CYG	B9	Iab	9	21:15:26.9	39:11:03	4.23		0.12	0.12
212593	4 LAC	B9	Iab	13	22:22:29.0	49:13:20	4.57		0.09	0.09
164865		B9	Ia	8	18:01:09.6	-24:11:08	7.66		0.87	0.87
98664	SIG LEO	B9.5	Vs	10	11:18:33.4	6:18:13	4.04		-0.06	-0.02
100889	THE CRT	B9.5	Vn	10	11:34:08.5	-9:31:32	4.70		-0.08	-0.04
166014	OMI HER	B9.5	V	10	18:05:35.4	28:45:15	3.84		-0.03	0.01
193432	NU CAP	B9.5	V	10	20:17:53.4	-12:55:04	4.75	A	-0.05	-0.01
222661	OMG2 AQR	B9.5	V	10	23:40:07.8	-14:49:17	4.48	AB	-0.04	0.00
186882	DEL CYG	B9.5	III	10	19:43:24.6	45:00:28	2.87	AB	-0.03	0.02
				--- A Stars ---						
103287	GAM UMA	A0	V	1	11:51:12.5	53:58:21	2.44		0.00	0.01
130109	109 VIR	A0	V	2	14:43:43.0	2:06:08	3.74		-0.01	0.00
153808	EPS HER	A0	V	10	16:58:22.4	30:59:55	3.92		-0.02	-0.01
212061	GAM AQR	A0	V	10	22:19:04.4	-1:38:23	3.85	A	-0.06	-0.05
111775		A0	IV	13	12:49:15.5	-47:49:21	6.32		0.03	0.05
123299	ALF DRA	A0	III	2	14:03:01.9	64:36:51	3.66		-0.05	-0.02
149212	15 DRA	A0	III	13	16:28:04.2	68:52:34	4.96		-0.05	-0.02
175687	XI1 SGR	A0	II	10	18:54:22.2	-20:43:24	5.07		0.13	0.13
46300	13 MON	A0	Ib	9	6:30:11.9	7:22:16	4.50		0.01	0.01
92207		A0	Ia	13	10:35:32.3	-58:28:23	5.47	V	0.50	0.48
80081	38 LYN	A1	V	13	9:15:44.3	37:00:55	3.81	AB	0.06	0.04
166205	DEL UMI	A1	Vn	10	17:48:18.3	86:36:34	4.36		0.02	0.00
198001	EPS AQR	A1	V	2	20:44:58.2	-9:40:48	3.77		0.00	-0.02
199629	NU CYG	A1	Vn	10	20:55:18.4	40:58:25	3.93		0.02	0.00
200761	THE CAP	A1	V	10	21:03:08.3	-17:25:57	4.06		-0.01	-0.03
214994	OMI PEG	A1	IV	10	22:39:24.3	29:02:46	4.80		-0.01	-0.01
12953		A1	Ia	9	2:05:09.8	58:11:13	5.69		0.61	0.58
95608	60 LEO	A1m:		10	10:59:39.7	20:26:54	4.42		0.06	-.--
197345	ALP CYG	A2	Ia	1	20:39:43.5	45:06:03	1.25	A	0.09	0.04
16970	GAM CET	A3	V	10	2:40:42.3	3:01:34	3.46	AB	0.09	0.01
38678	ZET LEP	A3	Vn	10	5:44:41.2	-14:50:21	3.54		0.10	0.02
106591	DEL UMA	A3	V	2	12:12:57.5	57:18:36	3.31	A	0.08	0.00
122408	TAU VIR	A3	V	10	13:59:05.9	1:47:08	4.25	A	0.10	0.02
210418	THE PEG	A3	Vn	10	22:07:40.6	5:57:04	3.52		0.09	0.01
216956	ALP PSA	A3	V	1	22:54:53.5	-29:53:15	1.16		0.09	0.01
33111	BET ERI	A3	III	2	5:05:23.3	-5:08:58	2.78	A	0.13	0.04
50019	THE GEM	A3	III	2	6:49:29.6	34:01:24	3.60	A	0.10	0.01
104035		A3	Ib	13	11:56:15.5	-64:03:39	5.61		0.17	0.11
157792	44 OPH	A3m		13	17:23:18.8	-24:07:52	4.17		0.28	-.--
97603	DEL LEO	A4	V	2	11:11:27.0	20:47:52	2.56	A	0.13	0.01

79439	18 UMA	A5	V	10	9:12:36.2	54:13:47	4.83		0.19	0.04
116842	80 UMA	A5	V	2	13:23:13.4	55:14:52	4.01		0.17	0.02
13041	58 AND	A5	IV-V	10	2:05:27.6	37:37:22	4.81		0.12	-0.03
159561	ALP OPH	A5	III	2	17:32:36.6	12:35:41	2.08		0.16	0.01
74272		A5	II	15	8:39:34.6	-47:08:16	4.77		0.12	0.02
59612		A5	Ib	2	7:27:43.9	-22:55:09	4.85	AB	0.23	0.13
28527		A6	IV	10	4:27:41.7	16:05:12	4.78	A	0.17	-0.02
97534		A6	Ia	13	11:10:26.8	-60:02:43	4.60	A	0.54	0.44
87696	21 LMI	A7	V	2	10:04:29.1	35:29:21	4.48		0.18	-0.02
99211	GAM CRT	A7	IV-V	10	11:22:22.8	-17:24:32	4.07	AB	0.21	-0.01
187642	ALF AQL	A7	IV-V	2	19:48:20.5	8:44:05	0.77	A	0.22	0.00
203280	ALP CEP	A7	IV-V	2	21:17:23.2	62:22:23	2.46	CD	0.22	0.00
76644	IOT UMA	A7	IV	1	8:55:47.6	48:14:22	3.14	A	0.20	-0.02
85123	UPS CAR	A7	II Vb	13	9:45:51.8	-64:50:24	2.96	AB	0.27	0.13
28910	RHO TAU	A8	V	10	4:31:00.4	14:44:27	4.65	V	0.25	-0.02
80404	IOT CAR	A8	Ib	13	9:15:45.1	-59:03:53	2.25		0.18	0.04
147547	GAM HER	A9	III	2	16:19:42.7	19:16:09	3.75	A	0.27	-0.01
				--- F Stars ---						
12311	ALP HYI	F0	V	13	1:57:11.7	-61:48:45	2.85		0.28	-0.04
27176	51 TAU	F0	V	10	4:15:25.3	21:27:31	5.65	A	0.28	-0.04
81937	23 UMA	F0	IV-Vb	13	9:27:36.5	63:16:55	3.66	A	0.33	0.03
7312		F0	III	13	1:10:27.3	-38:07:15	5.91		0.29	-0.03
89025	ZET LEO	F0	III	1	10:13:54.7	23:40:01	3.44	A	0.31	-0.01
36673	ALP LEP	F0	Ib	2	5:30:31.3	-17:51:24	2.58	A	0.21	0.06
156897	XI OPH	F1	III-IV	13	17:18:00.2	-21:03:39	4.39	AB	0.38	0.05
40136	ETA LEP	F1	III	13	5:54:07.5	-14:10:31	3.71		0.33	0.00
135153	1 LUP	F1	II	13	15:11:33.1	-31:20:01	4.90		0.38	0.13
159532	THE SCO	F1	II	13	17:33:43.3	-42:58:05	1.86		0.40	0.15
29875	ALF CAE	F2	V	13	4:38:56.9	-41:57:29	4.45	AB	0.34	-0.01
113139	78 UMA	F2	V	2	12:58:35.3	56:38:07	4.93	AB	0.37	0.02
82434	PSI VEL	F2	IV	13	9:28:43.6	-40:14:49	3.58	AB	0.36	-0.01
432	BET CAS	F2	III-IV	1	0:06:29.7	58:52:26	2.27	A	0.34	-0.03
17584	16 PER	F2	III	2	2:47:25.0	38:06:50	4.22	A	0.34	-0.02
129502	MU VIR	F2	III	13	14:40:25.2	-5:26:30	3.88		0.38	0.02
163506	89 HER	F2	Ia	2	17:53:24.0	26:03:24	5.45		0.34	0.16
182835	NU AQL	F2	Ib	13	19:23:57.6	0:14:14	4.66	A	0.59	0.41
157950		F3	V	13	17:23:58.5	-5:02:38	4.53		0.39	-0.02
164259	ZET SER	F3	V	2	17:57:50.4	-3:41:19	4.62		0.38	-0.03
206901	KAP PEG	F3	IV	13	21:42:22.7	25:24:51	4.14	AB	0.42	0.03
214470	31 CEP	F3	III-IV	13	22:34:32.0	73:23:00	5.08		0.39	0.00
61110	OMI GEM	F3	III	13	7:35:54.2	34:42:03	4.90		0.41	0.02
112374		F3	Ia	15	12:53:48.4	-26:11:22	6.62		0.68	0.47

161471	IOT1 SCO	F3	Ia	13	17:44:05.1	-40:06:34	3.02	A	0.51	0.30
26462	45 TAU	F4	V	13	4:08:40.3	5:23:39	5.73	A	0.36	-0.06
185395	THE CYG	F4	V	13	19:35:05.9	50:06:16	4.48	AB	0.38	-0.04
8799	OME AND	F4	IV	13	1:24:39.2	45:08:57	4.83	AB	0.42	0.00
99028	IOT LEO	F4	IV	15	11:21:19.1	10:48:17	3.94	AB	0.41	-0.01
199532	ALF OCT	F4	III	13	20:58:44.0	-77:13:01	5.14		0.49	0.07
209166	20 PEG	F4	III	13	21:58:39.0	12:52:46	5.62	A	0.34	-0.08
108177		F5	VI	13	12:23:01.5	1:34:02	9.66		0.43	-0.02
27524		F5	V	1	4:18:34.3	20:55:22	6.80		0.44	-0.01
27561		F5	V	13	4:18:45.2	14:17:33	6.61		0.41	-0.04
106516		F5	V	13	12:12:36.0	-10:01:14	6.11	A	0.47	0.02
134083	45 BOO	F5	V	13	15:05:06.2	25:03:46	4.93	A	0.43	-0.02
160922	OMG DRA	F5	V	13	17:37:14.3	68:46:52	4.79	A	0.43	-0.02
210027	IOT PEG	F5	V	2	22:04:40.8	25:06:01	3.77	A	0.43	-0.02
61421	ALP CMI	F5	IV-V	2	7:36:41.1	5:21:16	0.37	AB	0.42	0.00
139664		F5	IV-V	13	15:37:44.5	-44:29:50	4.63		0.40	-0.02
43905	45 AUR	F5	III	13	6:17:42.4	53:28:38	5.35		0.43	0.00
79940		F5	III	13	9:13:44.9	-37:12:14	4.62	AB	0.45	0.02
20902	ALP PER	F5	Ib	2	3:20:44.4	49:41:06	1.79	A	0.48	0.22
172052		F5	Ib	13	18:36:00.0	-23:13:38	6.73		0.66	0.40
30652	PI3 ORI	F6	V	1	4:47:07.4	6:52:32	3.19	A	0.45	-0.03
57623	DEL VOL	F6	V	13	7:16:51.6	-67:51:56	3.96		0.77	0.29
43318		F6	V	13	6:13:01.6	-0:29:31	5.64		0.50	0.02
69897	CHI CNC	F6	V	13	8:17:01.8	27:22:52	5.14		0.46	-0.02
142860	GAM SER	F6	V	2	15:54:08.5	15:49:25	3.85	A	0.48	0.00
153597	19 DRA	F6	V	13	16:55:44.8	65:12:39	4.89		0.48	0.00
173667	110 HER	F6	V	2	18:43:30.5	20:29:49	4.20	A	0.46	-0.02
82328	THE UMA	F6	IV	2	9:29:31.4	51:54:23	3.17	AB	0.46	0.00
89449	40 LEO	F6	IV	2	10:17:01.0	19:43:31	4.79		0.45	-0.01
207978	15 PEG	F6	IV	13	21:50:15.8	28:33:31	5.53		0.41	-0.05
160365		F6	III	1	17:36:39.8	13:21:19	6.12		0.56	0.10
120136	TAU BOO	F7	V	2	13:44:53.1	17:42:19	4.50	AB	0.48	-0.02
124850	IOT VIR	F7	V	13	14:13:23.3	-5:45:46	4.08		0.51	0.01
126660	THE BOO	F7	V	2	14:23:29.6	52:04:52	4.05	A	0.50	0.00
165908	99 HER	F7	V	2	18:05:07.5	30:33:13	5.05	AB	0.52	0.02
170153	CHI DRA	F7	V	2	18:21:57.5	72:42:42	3.57	A	0.49	-0.01
215648	XI PEG	F7	V	2	22:44:11.6	11:54:57	4.20	A	0.50	0.00
222368	IOT PSC	F7	V	2	23:37:22.6	5:21:19	4.13	A	0.51	0.01
151769	20 OPH	F7	IV	13	16:47:03.8	-10:41:46	4.65		0.47	-0.03
216385	SIG PEG	F7	IV	13	22:49:51.9	9:34:09	5.16	A	0.48	-0.02
8890	ALF UMI	F7	Ib-II	13	1:48:48.7	89:01:43	2.01	A	0.60	0.12
171635	45 DRA	F7	Ib	13	18:31:42.6	57:00:24	4.79		0.61	0.16
27808		F8	V	1	4:21:16.1	21:37:19	7.14		0.52	-0.01
90839	36 UMA	F8	V	2	10:27:26.4	56:14:15	4.83	A	0.52	-0.01

102870	BET VIR	F8	V	2	11:48:05.3	2:02:47	3.61	AB	0.55	0.02
187691	OMI AQL	F8	V	13	19:48:37.9	10:17:21	5.12	A	0.55	0.02
193901		F8	V	13	20:20:38.8	-21:31:05	8.65		0.55	0.02
217877		F8	V	13	23:01:21.0	-5:03:55	6.68		0.58	0.05
136202	5 SER	F8	IV-V	2	15:16:45.4	1:57:12	5.06	A	0.54	0.03
201891		F8	IV-V	13	21:09:40.0	17:32:04	7.37		0.51	0.00
208906		F8	IV-V	13	21:56:27.8	29:34:43	6.96	A	0.50	-0.01
220657	UPS PEG	F8	IV	2	23:22:52.8	23:07:43	4.41		0.61	0.08
172365		F8	Ib-II	13	18:37:09.2	5:13:03	6.35		0.79	0.22
194093	GAM CYG	F8	Ib	2	20:20:25.9	40:05:44	2.21	A	0.67	0.12
133683		F8	Iab-Ib	13	15:05:01.4	-66:53:36	5.76		0.68	0.13
54605	DEL CMA	F8	Ia	2	7:06:21.4	-26:18:45	1.83		0.68	0.13
27383		F9	V	13	4:17:02.8	16:24:12	6.89	AB	0.56	0.00
22879		F9	V	13	3:37:49.2	-3:22:29	6.69		0.54	-0.02
90508		F9-	V	12	10:24:59.3	49:03:09	6.44	AB	0.60	0.04
114762		F9	V	13	13:09:54.5	17:46:55	7.31		0.53	-0.03
142373	CHI HER	F9	V	2	15:50:56.7	42:35:26	4.62		0.56	0.00
157089		F9	V	13	17:18:35.5	1:29:16	6.97		0.58	0.02
200580		F9	V	13	21:01:36.9	2:48:01	7.32		0.54	-0.02

--- G Stars ---

4307	18 CET	G0	V	13	0:42:58.0	-13:09:04	6.14	A	0.60	0.00
4614	ETA CAS	G0	V	2	0:46:03.6	57:33:03	3.44	AB	0.57	-0.03
48682	PSI5 AUR	G0	V	13	6:43:08.2	43:37:46	5.24	A	0.55	-0.05
55575		G0	V	13	7:12:07.6	47:19:51	5.64		0.57	-0.03
109358	BET CVN	G0	V	2	12:31:22.2	41:37:44	4.26		0.59	-0.01
110897	10 CVN	G0	V	13	12:42:37.7	39:33:01	5.96		0.55	-0.05
114710	BET COM	G0	V	2	13:09:32.4	28:07:52	4.26	A	0.57	-0.03
152792		G0	V	13	16:51:57.4	42:54:36	6.83		0.62	0.02
157214	72 HER	G0	V	2	17:18:47.2	32:31:51	5.39	A	0.62	0.02
187923		G0	V	13	19:49:43.0	11:30:13	6.15	A	0.65	0.05
1461		G0	IV	13	0:16:07.4	-8:19:43	6.45		0.68	0.05
73593	34 LYN	G0	IV	13	8:37:34.2	46:00:39	5.38		1.00	0.37
121370	ETA BOO	G0	IV	2	13:52:18.1	18:38:51	2.68	A	0.58	-0.05
205153		G0	IV	13	21:31:13.9	-28:07:24	8.20		0.55	-0.08
6903	PSI3 PSC	G0	III	1	1:07:08.4	19:23:32	5.55		0.69	0.05
111812	31 COM	G0	III	1	12:49:15.8	27:48:44	4.94		0.67	0.03
84441	EPS LEO	G0	II	2	9:43:00.9	24:00:19	2.98		0.81	0.08
26630	MU PER	G0	Ib	1	4:11:13.0	48:17:03	4.15	A	0.96	0.14
204867	BET AQR	G0	Ib	1	21:28:55.6	-5:47:31	2.90	A	0.83	0.01
14802	KAP FOR	G1	V	13	2:20:15.2	-24:02:34	5.19		0.60	-0.02
27836		G1	V	1	4:21:22.4	14:38:38	7.61	V	0.60	-0.02
28068		G1	V	13	4:23:32.0	16:44:29	8.04	V	0.65	0.03

115043		G1	V	2	13:11:34.4	56:58:22	6.83	A	0.60	-0.02
190406	15 SGE	G1	V	13	20:01:51.3	16:56:00	5.79	ABC	0.60	-0.02
150680	ZET HER	G1	IV	1	16:39:23.9	31:41:32	2.81	AB	0.64	0.01
185758	ALF SGE	G1	II	1	19:37:51.6	17:53:51	4.38	A	0.78	-0.02
188650		G1	Ib-II	12	19:52:58.5	36:51:46	5.76		0.75	-0.08
10307		G2	V	2	1:38:43.8	42:21:48	4.95		0.62	-0.01
13043		G2	V	13	2:05:01.8	-0:51:00	6.89	A	0.62	-0.01
28344		G2	V	13	4:25:55.1	17:10:34	7.85	V	0.61	-0.02
30455		G2	V	13	4:45:46.3	18:37:40	6.96		0.62	-0.01
111721		G2	V	13	12:48:49.0	-13:12:54	7.97		0.80	0.17
143761	RHO CRB	G2	V	13	15:59:07.8	33:27:12	5.42	A	0.60	-0.03
186408	16 CYG A	G2	V	2	19:40:29.1	50:24:30	5.96	A	0.64	0.01
224930	85 PEG	G2	V	2	23:59:33.2	26:49:03	5.74	AB	0.67	0.04
2151	BET HYI	G2	IV	13	0:23:09.3	-77:32:08	2.80		0.62	-0.02
159181	BET DRA	G2	Ib-IIa	1	17:29:18.0	52:20:15	2.80	AB	0.97	0.09
209750	ALP AQR	G2	Ib	2	22:03:12.9	0:33:48	2.94	A	0.97	0.09
100261	OMG1 CEN	G2	Ia	1	11:29:26.8	-59:09:57	5.13	A	1.07	0.19
26736		G3	V	17	4:11:32.1	23:27:01	8.08		0.66	0.01
86728	20 LMI	G3	Va H delta 1	12	9:58:08.8	32:10:14	5.37	A	0.65	0.00
144608	OMG2 SCO	G3	II-III	11	16:04:28.0	-20:44:06	4.32		0.84	-0.02
192876	ALP1 CAP	G3	Ib	13	20:14:52.6	-12:39:51	4.25	A	1.07	0.15
82210	24 UMA	G4	III-IV	1	9:30:05.8	70:03:06	4.57		0.77	-0.03
74006	BET PYX	G4	III	13	8:38:08.6	-35:07:47	3.96	A	0.94	0.06
71369	OMI UMA	G4	II-III	13	8:26:07.6	60:53:14	3.37	AB	0.85	-0.02
204075	ZET CAP	G4	Ib	15	21:23:48.9	-22:37:44	3.74	A	1.00	0.04
20630	KAP CET	G5	V	2	3:16:44.1	3:11:17	4.83	A	0.68	0.00
26756		G5	V	17	4:11:36.0	14:30:00	8.46		0.70	0.02
117176	70 VIR	G5	V	2	13:25:59.0	14:02:43	4.97	A	0.71	0.03
186427	16 CYG B	G5	V	2	19:40:32.0	50:24:02	6.22	B	0.66	-0.02
197076		G5	V+	13	20:38:29.4	19:45:09	6.44	A	0.61	-0.07
161797	MU HER	G5	IV	2	17:44:29.9	27:44:55	3.42	A	0.75	0.05
93497	MU VEL	G5	IIIa	17	10:44:36.8	-49:09:19	2.69	AB	0.90	0.00
153751	EPS UMI	G5	III	13	16:51:00.9	82:07:21	4.23	A	0.90	0.00
36079	BET LEP	G5	II	11	5:26:06.0	-20:47:52	2.84	AB	0.82	-0.05
206859	9 PEG	G5	Ib	2	21:42:08.5	17:07:11	4.34		1.16	0.16
114946	55 VIR	G6	V	15	13:11:30.0	-19:40:07	5.32		0.88	0.16
115617	61 VIR	G6	V	2	13:15:47.0	-18:02:01	4.74	A	0.71	-0.01
109379	BET CRV	G7	IIIa Ba 0.3:	11	12:31:45.3	-23:07:13	2.65		0.90	-0.04
148856	BET HER	G7	IIIa	11	16:28:04.1	21:35:50	2.78	A	0.93	-0.01
10700	TAU CET	G8	Vp	2	1:41:44.6	-16:12:00	3.50	A	0.73	-0.01
13783		G8	V	13	2:12:59.0	64:43:32	8.30		0.67	-0.07
64606		G8	V	13	7:52:02.6	-1:16:47	7.44		0.73	-0.01
75732	RHO1 CNC	G8	V	13	8:49:37.4	28:31:23	5.95	A	0.86	0.12
101501	61 UMA	G8	V	2	11:38:25.3	34:29:03	5.32	A	0.72	-0.02

103095		G8	Vp	2	11:50:06.2	38:04:39	6.45		0.75	0.01
211038		G8	V	13	22:11:55.9	-16:03:45	6.55		0.89	0.15
67767	PSI CNC	G8	IV	13	8:07:26.7	25:39:38	5.72	A	0.82	0.00
182572	31 AQL	G8	IV H delta 1	11	19:22:35.2	11:50:09	5.16	A	0.76	-0.06
188512	BET AQL	G8	IV	2	19:52:51.3	6:16:49	3.72	AB	0.85	0.03
37160	PHI2 ORI	G8	IIIb	1	5:34:09.4	9:15:55	4.08		0.96	0.01
96566		G8	III	15	11:04:28.9	-62:09:12	4.61		1.03	0.08
115659	GAM HYA	G8-	IIIa	11	13:16:11.8	-22:54:29	2.99	A	0.92	-0.03
133208	BET BOO	G8-	IIIa: Ba 0.4	11	15:00:03.6	40:35:12	3.51		0.96	0.01
150997	ETA HER	G8	IIIb CN-1	11	16:41:10.8	39:00:58	3.49	A	0.92	-0.03
192947	ALF2 CAP	G8	IIIb	12	20:15:16.8	-12:42:04	3.57	ABC	0.94	-0.01
216131	MU PEG	G8	III+	1	22:47:35.2	24:20:13	3.49		0.94	-0.01
202109	ZET CYG	G8	II CN 1	1	21:10:48.3	30:01:15	3.21	A	0.99	0.00
48329	EPS GEM	G8	Ib	2	6:40:51.3	25:10:56	2.99	A	1.40	0.26
72324	UPS2 CNC	G9	III	13	8:30:02.9	24:15:22	6.35		1.03	0.05
96436	65 LEO	G9	III	14	11:04:21.1	2:13:38	5.52	AB	0.97	-0.01
180711	DEL DRA	G9	III	1	19:12:33.8	67:34:25	3.07	A	0.99	0.01
76294	ZET HYA	G9	II-III	1	8:52:45.0	6:08:13	3.10		1.00	0.00
				--- K Stars ---						
10780		K0	V	13	1:44:06.4	63:36:24	5.63	A	0.80	-0.01
134439		K0	V	13	15:07:28.5	-16:08:27	9.07	A	0.77	-0.04
185144	SIG DRA	K0	V	2	19:32:27.5	69:34:34	4.68	A	0.79	-0.02
192310		K0	V	13	20:12:10.4	-27:11:01	5.73		0.88	0.07
198149	ETA CEP	K0	IV	2	20:44:16.4	61:38:38	3.42	AB	0.92	0.01
6203	25 CET	K0	III-IV	13	1:00:30.8	-5:06:13	5.44	A	1.11	0.10
4128	BET CET	K0	III CH-1 H&K-0.5	12	0:41:04.8	-18:15:38	2.04		1.02	0.01
19476	KAP PER	K0	III	13	3:06:06.8	44:40:10	3.80	A	0.98	-0.03
39364	DEL LEP	K0	III CN-2	11	5:49:10.1	-20:52:55	3.78		1.00	-0.01
49293	18 MON	K0	III Ba 0.1	11	6:45:15.2	2:28:06	4.47		1.11	0.10
62509	BET GEM	K0	IIIb	1	7:42:15.5	28:08:55	1.14	AC	1.00	-0.01
88284	LAM HYA	K0	III CN 1	11	10:08:08.9	-12:06:22	3.61	A	1.01	0.00
95272	ALP CRT	K0+	III	11	10:57:20.1	-18:01:56	4.08		1.09	0.08
197989	EPS CYG	K0-	III	1	20:44:11.1	33:46:55	2.47	A	1.03	0.02
216228	IOT CEP	K0-	III	1	22:47:53.6	65:56:13	3.52		1.05	0.04
219615	GAM PSC	K0-	III: CN-1.5	11	23:14:34.3	3:00:31	3.70		0.92	-0.09
207089	12 PEG	K0	Ib	1	21:43:46.1	22:43:03	5.29		1.38	0.20
221861		K0	Ib	11	23:32:48.0	71:21:56	5.84		1.80	0.62
10476	107 PSC	K1	V	2	1:39:46.6	20:01:34	5.24	A	0.84	-0.02
26965	OMI2 ERI	K1-	V	12	4:12:58.2	-7:43:46	4.42	A	0.82	-0.04
132142		K1	V	13	14:53:45.6	53:52:30	7.77		0.79	-0.07
142091	KAP CRB	K1	IVa	1	15:49:20.8	35:48:41	4.81	A	1.00	0.01
142980	PHI SER	K1	IV	13	15:54:56.0	14:33:23	5.54		1.14	0.15

145148		K1+	IV	12	16:06:43.3	6:31:12	5.95		0.99	0.00
145328	TAU CRB	K1-	III-IV	11	16:07:08.5	36:37:01	4.76	AB	1.01	-0.08
160635	ETA PAV	K1	III	13	17:40:49.2	-64:42:09	3.61		1.19	0.10
163770	THE HER	K1	IIa CN+2	1	17:54:32.1	37:15:21	3.86		1.35	0.21
210745	ZET CEP	K1.5	Ib	1	22:09:06.9	57:57:15	3.35		1.57	0.36
22049	EPS ERI	K2	V	2	3:30:34.3	-9:37:34	3.73		0.88	-0.04
166620		K2	V	2	18:07:58.0	38:27:12	6.40		0.88	-0.04
10486		K2	IV	13	1:40:13.2	45:04:15	6.33		1.02	-0.02
51440	62 AUR	K2	III	13	6:55:38.5	38:07:23	6.00		1.22	0.06
54719	TAU GEM	K2-	III	11	7:07:57.5	30:19:45	4.41	AB	1.26	0.10
66141		K2	III	13	7:59:39.9	2:28:24	4.39	A	1.25	0.09
72184		K2	III	13	8:29:40.3	38:11:22	5.90		1.11	-0.05
73471	SIG HYA	K2	III	13	8:36:08.7	3:31:05	4.45		1.21	0.05
85503	MU LEO	K2	IIIb CN 1 Ca 1 Ba -1	11	9:49:55.4	26:14:36	3.88		1.22	0.06
137759	IOT DRA	K2	III	2	15:23:48.7	59:08:26	3.29	A	1.17	0.01
161096	BET OPH	K2	III	1	17:41:00.0	4:35:11	2.77		1.17	0.01
163588	XI DRA	K2	III	1	17:52:39.7	56:52:47	3.75	A	1.18	0.02
20644		K2	II-III	13	3:17:18.4	28:52:07	4.47		1.55	0.42
150798	ALF TRA	K2	IIb-IIIa	13	16:43:21.0	-68:56:19	1.91		1.45	0.32
157999	SIG OPH	K2	II	1	17:24:01.8	4:10:56	4.33		1.50	0.21
206778	EPS PEG	K2	Ib	2	21:41:43.7	9:38:41	2.39	A	1.52	0.29
144872		K3	V	13	16:04:41.9	38:46:22	8.61		0.95	0.00
219134		K3	V	2	23:10:52.0	56:53:30	5.57	A	0.99	0.04
10380	NU PSC	K3-	IIIb Ba 0.1	11	1:38:49.6	5:14:07	4.44		1.36	0.10
35620	PHI AUR	K3	III CN+2	11	5:24:19.8	34:26:07	5.08	AD	1.40	0.14
125560	20 BOO	K3	III	13	14:17:23.1	16:32:06	4.84		1.23	-0.03
132345	18 LIB	K3-	III CN 2	11	14:56:11.1	-10:56:39	5.84	A	1.26	0.00
31398	IOT AUR	K3	II	1	4:53:43.9	33:05:19	2.68		1.53	0.13
89388		K3	IIa	13	10:15:24.5	-61:04:55	3.36	A	1.54	0.14
157244	BET ARA	K3	Ib-IIa	13	17:21:08.2	-55:29:06	2.84		1.46	0.05
69267	BET CNC	K4	III	1	8:13:48.2	9:20:27	3.53	A	1.48	0.05
127700	5 UMI	K4-	III Ba 0.3	12	14:27:36.1	75:55:05	4.27	A	1.43	0.00
131873	BET UMI	K4	III	1	14:50:49.6	74:21:35	2.07	AB	1.47	0.04
209747	NU PEG	K4	III	13	22:03:09.4	4:48:48	4.85		1.45	0.02
78647	LAM VEL	K4	Ib-IIa	13	9:06:09.3	-43:13:47	2.20	A	1.67	0.21
201091	61 CYG A	K5	V	1	21:04:40.0	38:30:00	5.23	A	1.16	0.01
29139	ALP TAU	K5	III	1	4:33:02.8	16:24:37	0.87	A	1.54	0.03
139669	THE UMI	K5	III	13	15:32:51.2	77:30:59	4.96		1.58	0.07
164058	GAM DRA	K5	III	1	17:55:26.5	51:29:38	2.23	A	1.52	0.01
44537	PSI1 AUR	K5-M0	Iab-Ib	1	6:21:02.8	49:18:56	4.87		1.96	0.36
201092	61 CYG B	K7	V	1	21:04:38.0	38:29:30	6.06	B	1.35	0.02
17709	17 PER	K7	III	1	2:48:25.5	34:51:19	4.54		1.56	0.03
70272	31 LYN	K7	III	1	8:19:25.2	43:21:00	4.25		1.55	0.02
80493	ALF LYN	K7	IIIab	1	9:18:00.8	34:36:18	3.14		1.55	0.02

149161	29 HER	K7	III	1	16:30:15.7	11:35:38	4.83		1.49	-0.04
52877	SIG CMA	K7	Ib	1	6:59:43.5	-27:51:43	3.46	A	1.73	0.11
				--- M Stars ---						
6860	BET AND	M0	IIIa	1	1:06:55.5	35:21:21	2.05	A	1.58	0.01
9053	GAM PHE	M0-	IIIa	11	1:26:11.7	-43:34:25	3.41		1.57	0.00
89758	MU UMA	M0	III H&Kem	1	10:19:21.4	41:45:06	3.05		1.58	0.01
100029	LAM DRA	M0	III Ca-1	12	11:28:27.5	69:36:26	3.85		1.61	0.04
111631		M0.5	V	2	12:48:09.6	-0:29:26	8.49		1.41	-0.06
146051	DEL OPH	M0.5	III	1	16:11:43.3	-3:34:01	2.73	A	1.58	-0.01
102212	NU VIR	M1	IIIab	1	11:43:17.3	6:48:34	4.03		1.51	-0.09
112769	36 COM	M1-	IIIb	1	12:56:27.0	17:40:42	4.77		1.57	-0.03
141477	KAP SER	M1-	IIIab	1	15:46:29.2	18:17:41	4.10		1.61	0.01
168720	106 HER	M1	IIIb	1	18:18:10.8	21:56:19	4.94		1.59	-0.01
49331		M1+	Ib-IIa	11	6:45:13.7	-8:56:32	5.05		1.80	0.15
39801	ALP ORI	M1-M2	Ia-Ib	1	5:52:27.8	7:23:57	0.48		1.86	0.21
95735		M2	V	2	11:00:36.5	36:18:20	7.50		1.51	0.04
216399		dM2		16	22:49:52.3	22:37:02	8.65		~1.30	~0.00
1013	CHI PEG	M2+	III	1	0:12:00.6	19:55:43	4.80		1.57	-0.03
86663	PI LEO	M2-	IIIab	11	9:57:34.3	8:17:05	4.69		1.60	0.00
119228	83 UMA	M2	IIIab	1	13:38:50.5	54:56:03	4.66		1.63	0.03
219734	8 AND	M2	III	1	23:15:25.1	48:44:30	4.83	AB	1.66	0.06
36389	119 TAU	M2	Iab-Ib	1	5:29:16.7	18:33:31	4.35		2.07	0.42
206936	MU CEP	M2	Ia	1	21:41:58.5	58:33:00	4.10	A	2.33	0.68
173739		M3	V	14	18:42:12.1	59:33:16	8.90	A	1.54	0.07
224427	PSI PEG	M3	III	1	23:55:12.4	24:51:48	4.67		1.58	-0.02
44478	MU GEM	M3	IIIab	1	6:19:56.0	22:32:27	2.87	A	1.64	0.04
112300	DEL VIR	M3	III	1	12:53:04.9	3:40:07	3.38	A	1.57	-0.03
133216	SIG LIB	M3-	III	12	15:01:08.2	-25:05:12	3.30		1.68	0.08
40239	PI AUR	M3	II	1	5:56:13.3	45:56:04	4.29		1.70	0.10
108903	GAM CRU	M3.5	III	11	12:28:22.7	-56:50:00	1.62	A	1.60	-0.02
19058	RHO PER	M4	IIb-IIIa	1	3:01:57.7	38:38:52	3.39		1.65	0.02
175588	DEL2 LYR	M4	II	1	18:52:45.2	36:50:02	4.28	A	1.67	0.04
123657		M4.5	III	12	14:05:55.8	44:05:29	5.26		1.58	-0.06
145713	10 HER	M4.5	IIIa	15	16:09:30.1	23:37:22	5.58		1.57	-0.07
132813		M5	III	1	14:56:46.8	66:07:52	4.59		1.59	-0.06
148783	30 HER	M6-	III	1	16:26:59.8	41:59:26	5.00		1.54	0.05
207076		M7	III:	1	21:43:56.4	-2:26:40	6.69		1.49	-0.01

--- End of Atlas (Sort by Spectral Type) ---

IUE Ultraviolet Spectral Atlas of Standard Stars

CSC Computer Sciences Corporation

IUE NEWSIPS Atlas : Subluminous Star Atlas, sorted by Spectral Type

Star Name	Sp_Type	RA(1950.0) hh:mm:ss	DEC(1950.0) dd:mm:ss	V mag	B-V mag
HD 49798	sdO	06:46:34.85	-44:15:33.5	8.27	-0.30
BD +75 325	sdO	08:04:43.44	75:06:47.7	9.54	-0.37
AGK +81-266	sdO	09:13:42.53	81:56:11.29	11.85	-0.34
HZ 44	sdO	13:21:19.10	36:23:38.00	11.71	-0.27
BD +28 4211	sdO	21:48:57.30	28:37:44	10.52	-0.34
GD 108	sdB	10:00:47.33	-07:33:31.2	13.56	-0.23
FEIGE 65	sdB	12:33.24	42:39	12.01	-0.24
FEIGE 66	sdB	12:34:54.69	25:20:30.4	10.51	-0.26
G 191-B2 B	DA1	05:01:31.3	52:45:50	11.78	-0.29
GD 71	DA1	05:49:34	15:52.7	13.04	-0.24
BPM 16274	DA2	00:50:03.18	-52:08:17.4	14.20	-0.02
GD 50	DA2	03:48:50.06	-00:58:30.4	14.05	-0.28
G 87-7	DA2	06:44:15	37:34.9	12.04	-0.07
GD 394	DA2	21:11:03.1	49:53:53	13.10	-0.23
HZ 2	DA3	04:09:57.00	11:44:13.92	13.86	-0.05
GRW +70 5824	DA3	13:38:51.77	70:17:08.5	12.79	-0.09
G 93-48	DA3	21:52:25.33	02:23:24.3	12.74	-0.01
FEIGE 108	DAS	23:13:36	-02:07	12.90	-0.28
40 ERI B	DA4	04:13:03.66	-07:44:08.9	9.50	0.11
HZ 4	DA4	03:52:37.90	09:38:34.08	14.47	0.08
LB 227	DA4	04:06:36.89	17:00:03.96	15.35	0.05
G 226-29	DAV	16:47:38	59:08:42	12.19	0.04
LDS 532-81	DA6	08:39:35.9	-32:46:55	12.0	0.16
ROSS 627	DA7	11:21:37.9	21:38:05	14.17	0.37
FEIGE 7	DABP3	00:41:15	-10:16.6	14.52	0.01
GD 323	DAB	13:02:27	59:42:54	14.52	-0.13
GD 303	DB4	10:11:17	57:03.5	14.62	-0.14
L 1573-31	DB4	19:40.24	37:24	14.57	-0.10
LDS 749 B	DB4	21:29:36.60	00:00:00.00	14.73	-0.04
LDS 678 B	DBQ	19:17:52.9	-07:45:34	12.33	0.05
G 175-34 B	DC7	04:26:50	58:53.3	12.44	0.31
HZ 21	DO1	12:11:24	33:12	14.63	-0.28
PG 1159-03	DO2	11:59:12.3	-03:28:57	14.87	-0.37
FEIGE 34	DO	10:36:40.00	43:21:52.00	11.12	-0.30
FEIGE 110	DOp	23:19:58.39	-05:09:55.8	11.50	-0.30
VAN MAANEN 2	DZ8	00:46:28.8	05:10:21	12.46	0.52
L 145-141	DQ6	11:42:58.0	-64:33:34	11.44	0.16
GRW +70 8247	DXP	19:00:40	70:35.6	13.14	0.08

jinger@stsci.edu
last updated: ***Feb. 29, 2000***

IUE Standard Stars Atlas (NEWSIPS)

HD 164794
9 SGR

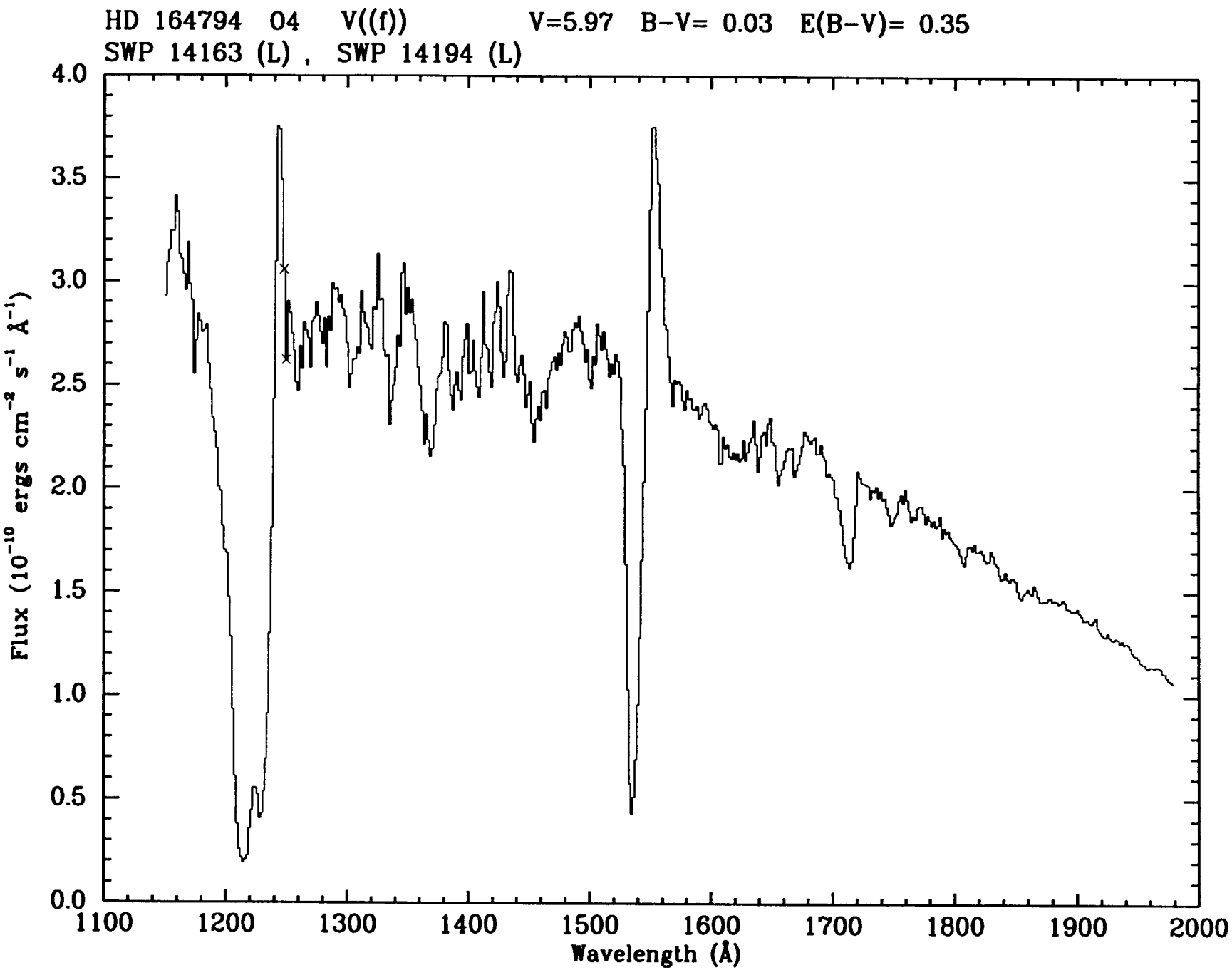
Sp_Type	RA	DEC	V	Rem	B-V	E(B-V)
O4 V((f))	18:00:48.4	-24:21:48	5.97		0.03	0.35

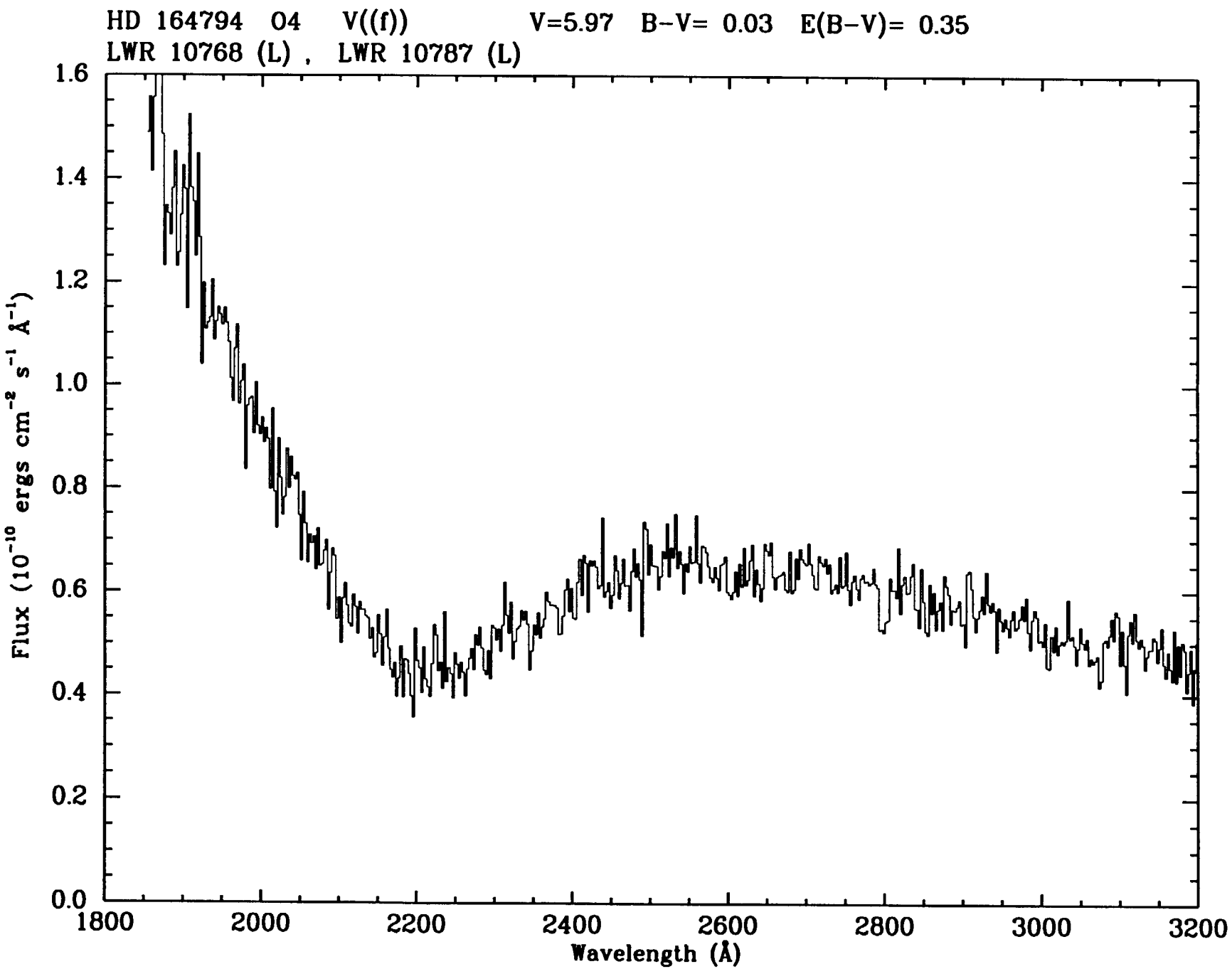
* Low-Dispersion Merged Extracted Image (MXLO)

Image	Ap	N	Exp	E/C/B
SWP14163(gif)(ps)(w_f)	L	T	18.280	---/230/23
SWP14194(gif)(ps)(w_f)	L	T	16.121	---/226/25
LWR10768(gif)(ps)(w_f)	L	1	3.151	---/205/26
LWR10787(gif)(ps)(w_f)	L	T	13.541	---/203/25

* Combined Image

SWP14163,SWP14194 (gif)(ps)(w_f)
LWR10768,LWR10787 (gif)(ps)(w_f)


HD 164794 O4 V((f)) V=5.97 B-V= 0.03 E(B-V)= 0.35
SWP 14163 (L) , SWP 14194 (L)
Flux (10^{-10} ergs cm^{-2} s^{-1} Å^{-1})
Wavelength (Å)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000


HD 164794 O4 V((f)) V=5.97 B-V= 0.03 E(B-V)= 0.35
LWR 10768 (L) , LWR 10787 (L)
Flux (10^{-10} ergs cm^{-2} s^{-1} Å^{-1})
Wavelength (Å)
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1800
2000
2200
2400
2600
2800
3000
3200

IUE Standard Stars Atlas (NEWSIPS)

HD 93027

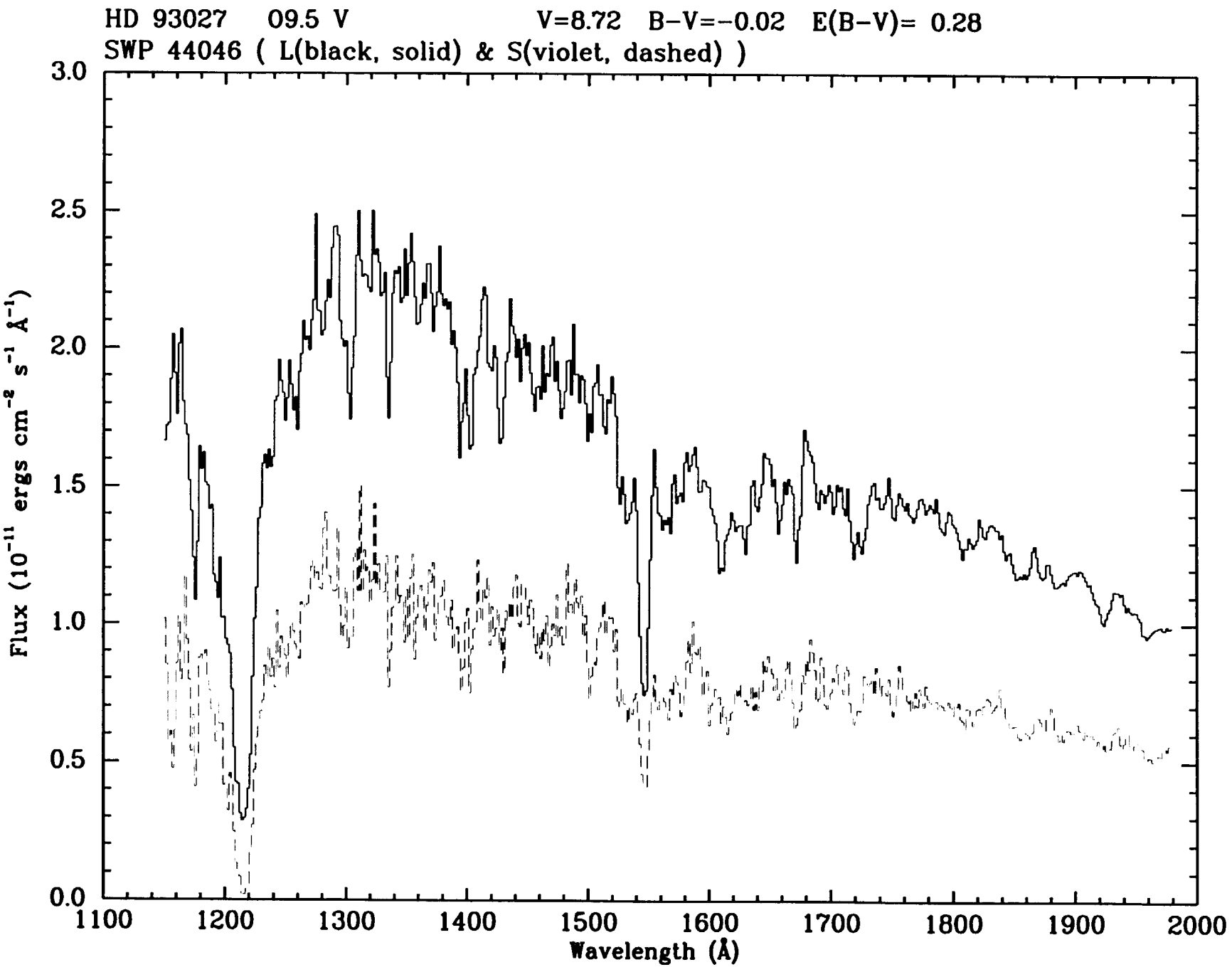
Sp_Type	RA	DEC	V	Rem	B-V	E(B-V)
O9.5 V	10:41:18.3	-59:52:40	8.72		0.02	0.28

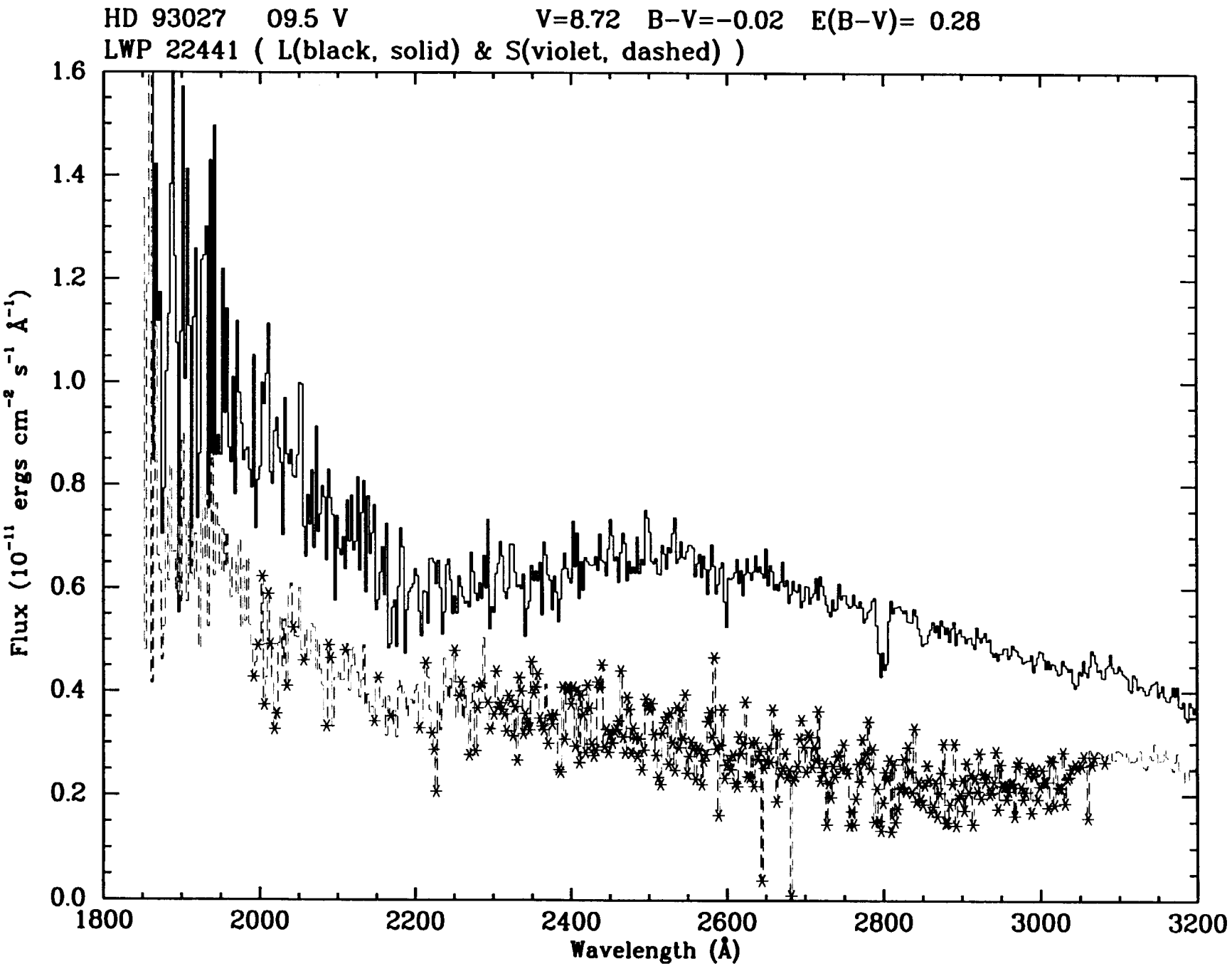
*** Low-Dispersion Merged Extracted Image (MXLO)**

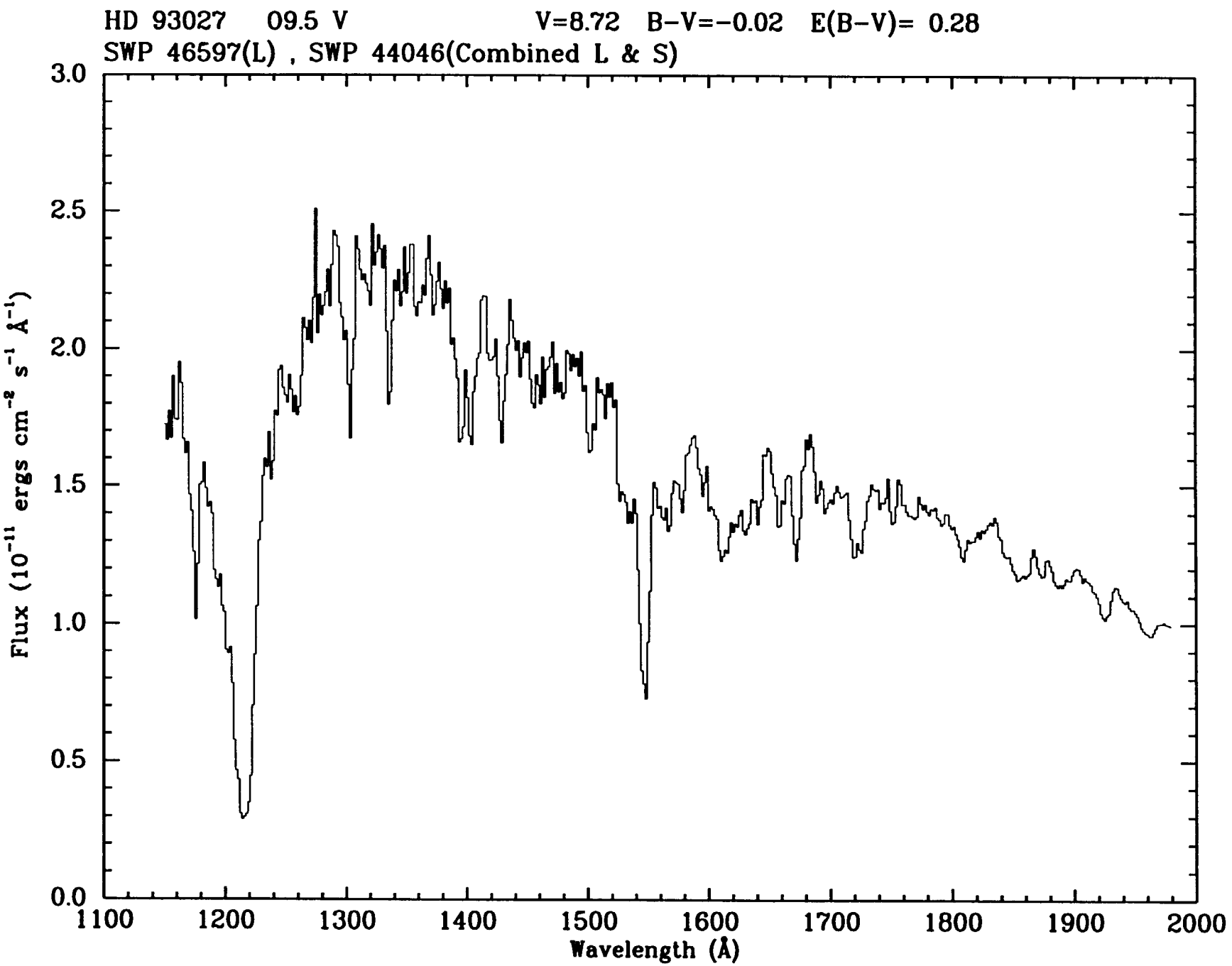
Image	Ap	N	Exp	E/C/B
SWP44046(gif)(ps)(w_f)	L	T	161.469	---/170/18
	S	1	59.672	---/140/18
SWP46597(gif)(ps)(w_f)	L	T	216.881	---/208/15
LWP22441(gif)(ps)(w_f)	L	T	131.416	---/170/38
	S	1	239.493	---/5X/38
LWP24604(gif)(ps)(w_f)	L	T	197.124	---/242/35

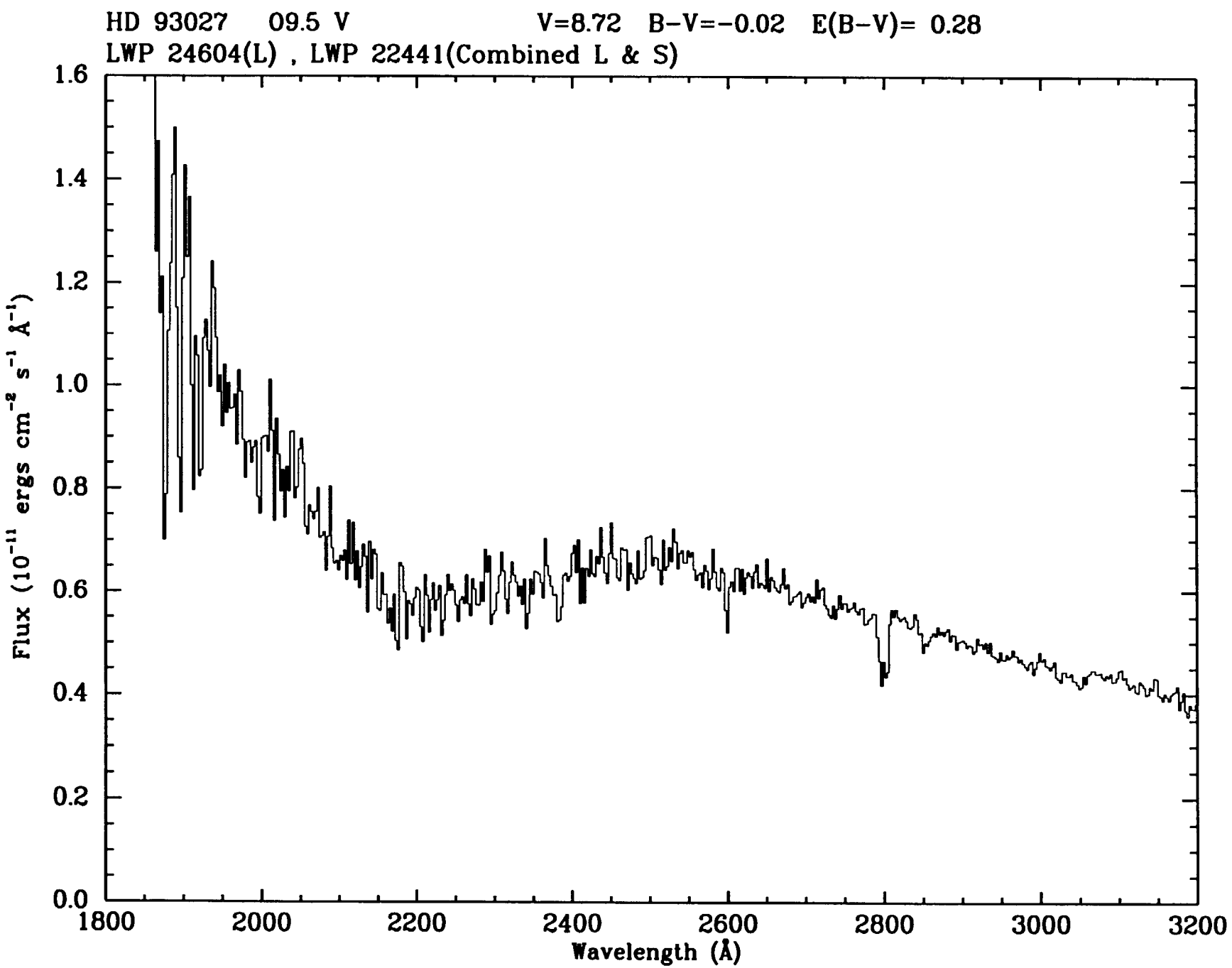
*** Combined Image**

SWP44046,SWP46597 (gif)(ps)(w_f)
LWP22441,LWP24604 (gif)(ps)(w_f)


HD 93027 09.5 V V=8.72 B−V=−0.02 E(B−V)= 0.28
SWP 44046 (L(black, solid) & S(violet, dashed))
Flux (10^{-11} ergs cm^{-2} s^{-1} Å^{-1})
Wavelength (Å)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000


HD 93027 09.5 V V=8.72 B-V=-0.02 E(B-V)= 0.28
LWP 22441 (L(black, solid) & S(violet, dashed))
Flux (10^{-11} ergs cm^{-2} s^{-1} Å^{-1})
Wavelength (Å)
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1800
2000
2200
2400
2600
2800
3000
3200


HD 93027 09.5 V V=8.72 B-V=-0.02 E(B-V)= 0.28
SWP 46597(L) , SWP 44046(Combined L & S)
Flux (10^{-11} ergs cm^{-2} s^{-1} Å^{-1})
Wavelength (Å)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000


HD 93027 09.5 V V=8.72 B-V=-0.02 E(B-V)= 0.28
LWP 24604(L) , LWP 22441(Combined L & S)
Flux (10^{-11} ergs cm^{-2} s^{-1} Å^{-1})
Wavelength (Å)
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1800
2000
2200
2400
2600
2800
3000
3200

IUE Standard Stars Atlas (NEWSIPS)

HD 188665
23 CYG

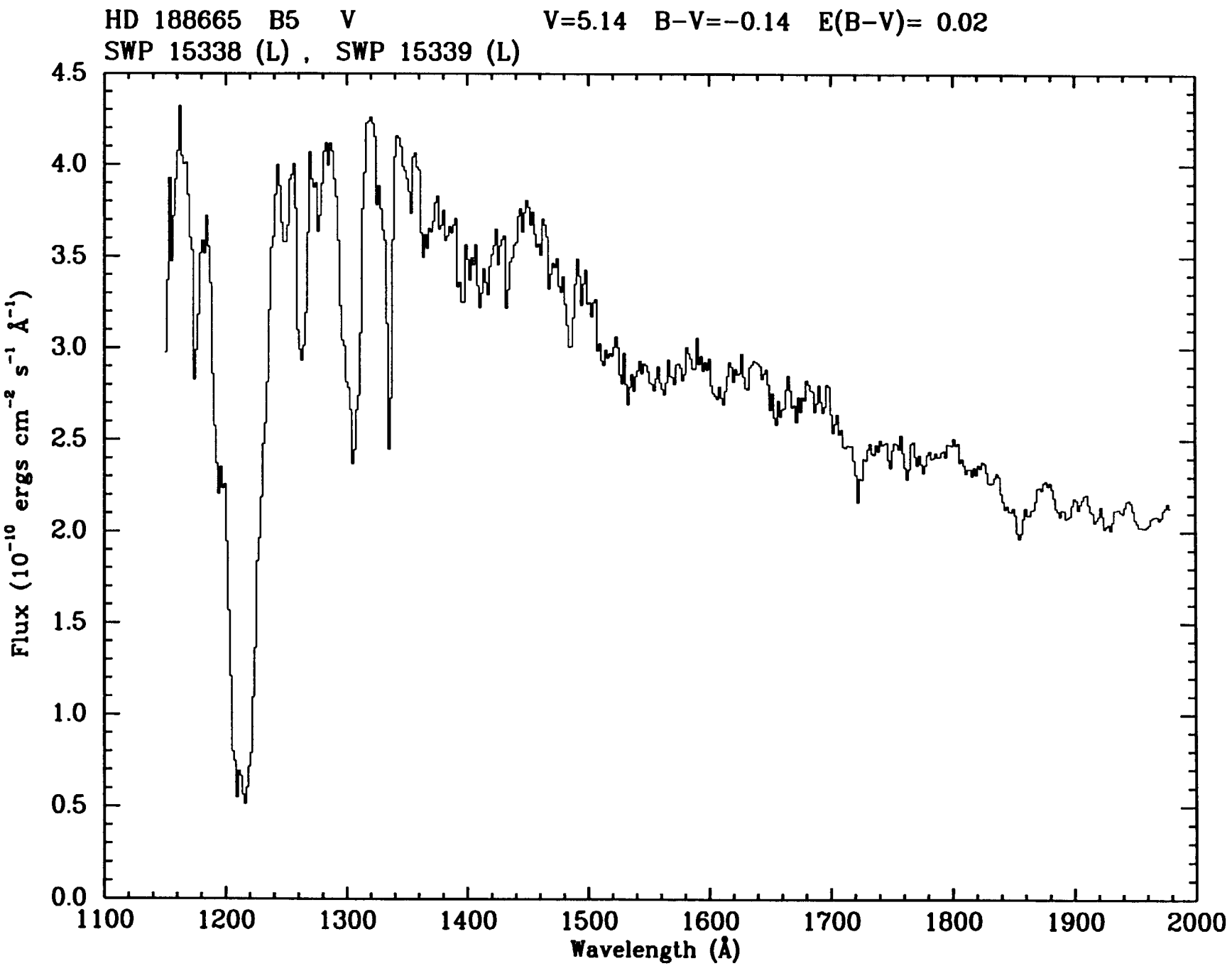
Sp_Type	RA	DEC	V	Rem	B-V	E(B-V)
B5 V	19:52:15.8	57:23:30	5.14		-0.14	0.02

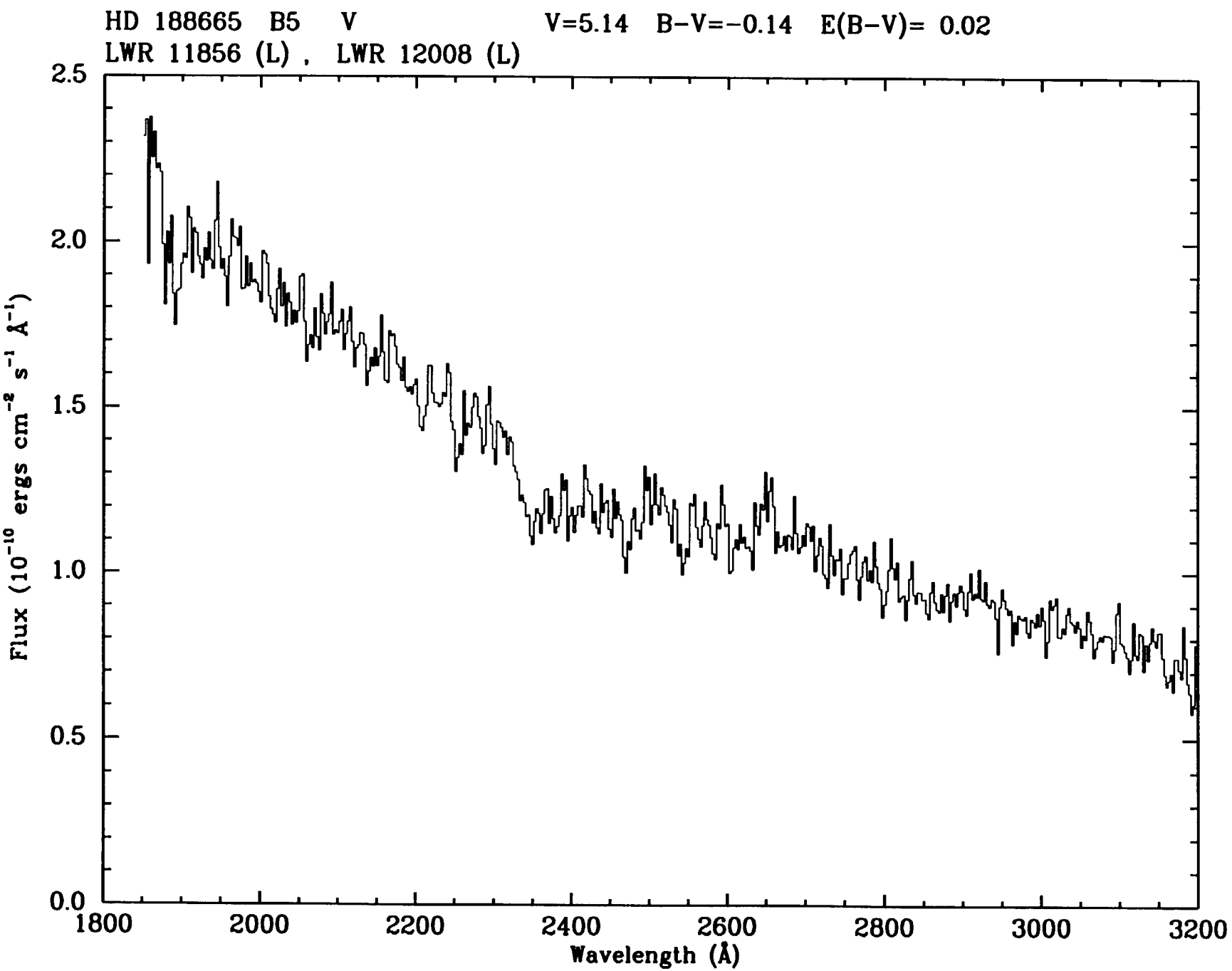
* Low-Dispersion Merged Extracted Image (MXLO)

Image	Ap	N	Exp	E/C/B
SWP15338(gif)(ps)(w_f)	L	T	5.371	---/120/25
	S	1	0.705	---/---/--
SWP15339(gif)(ps)(w_f)	L	T	8.055	---/180/29
	S	1	1.058	---/---/--
LWR11856(gif)(ps)(w_f)	L	T	9.023	---/208/30
LWR12008(gif)(ps)(w_f)	L	T	10.152	---/205/25

* Combined Image

SWP15338,SWP15339 (gif)(ps)(w_f)
LWR11856,LWR12008 (gif)(ps)(w_f)


HD 188665 B5 V
V=5.14 B-V=-0.14 E(B-V)= 0.02
SWP 15338 (L) , SWP 15339 (L)
Flux (10^{-10} ergs cm^{-2} s^{-1} Å^{-1})
Wavelength (Å)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000


HD 188665 B5 V
V=5.14 B-V=-0.14 E(B-V)= 0.02
LWR 11856 (L) , LWR 12008 (L)
Flux (10^{-10} ergs cm^{-2} s^{-1} Å^{-1})
Wavelength (Å)
0.0
0.5
1.0
1.5
2.0
2.5
1800
2000
2200
2400
2600
2800
3000
3200

IUE Standard Stars Atlas (NEWSIPS)

HD 59612

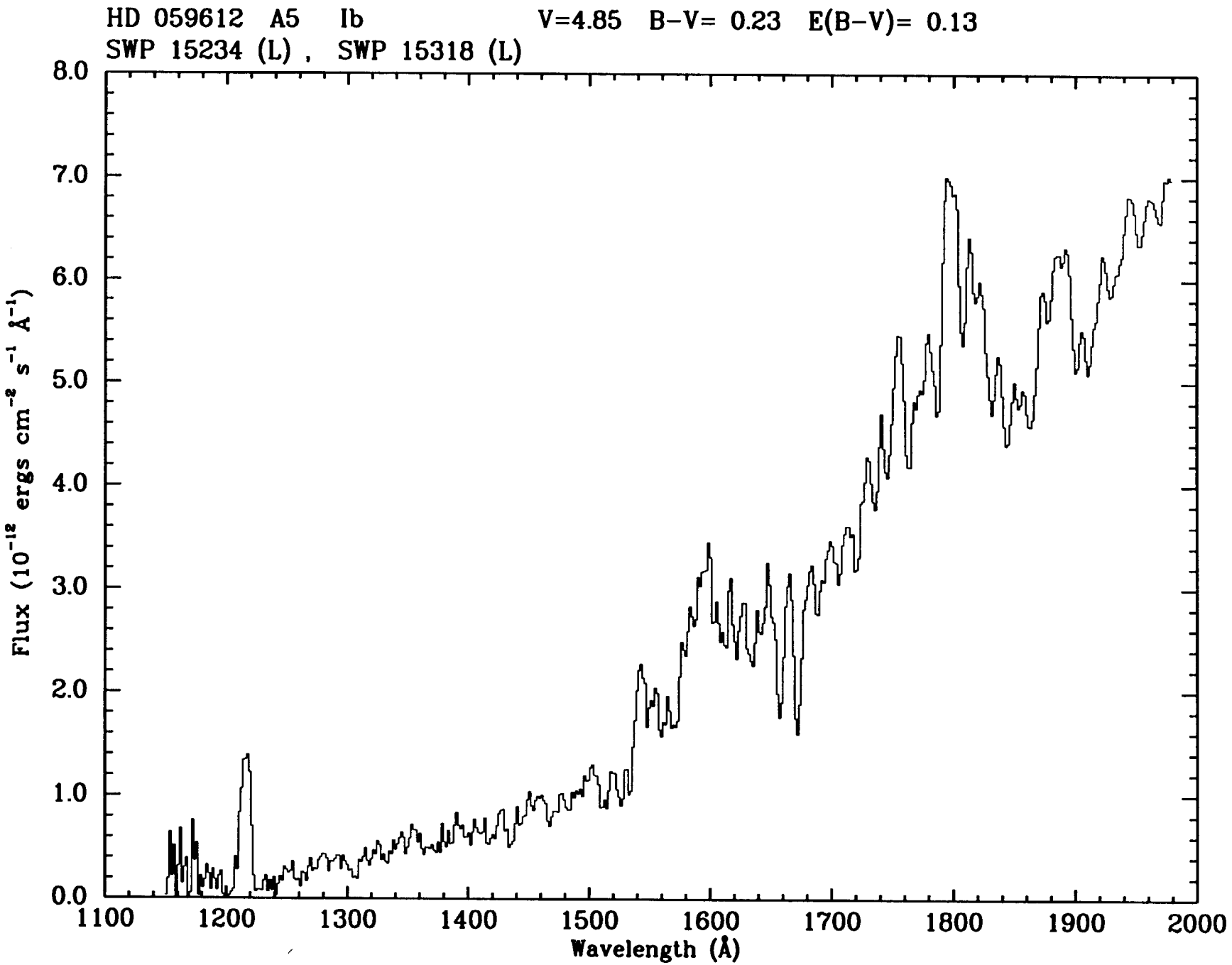
Sp_Type	RA	DEC	V	Rem	B-V	E(B-V)
A5 Ib	7:27:43.9	-22:55:09	4.85	AB	0.23	0.13

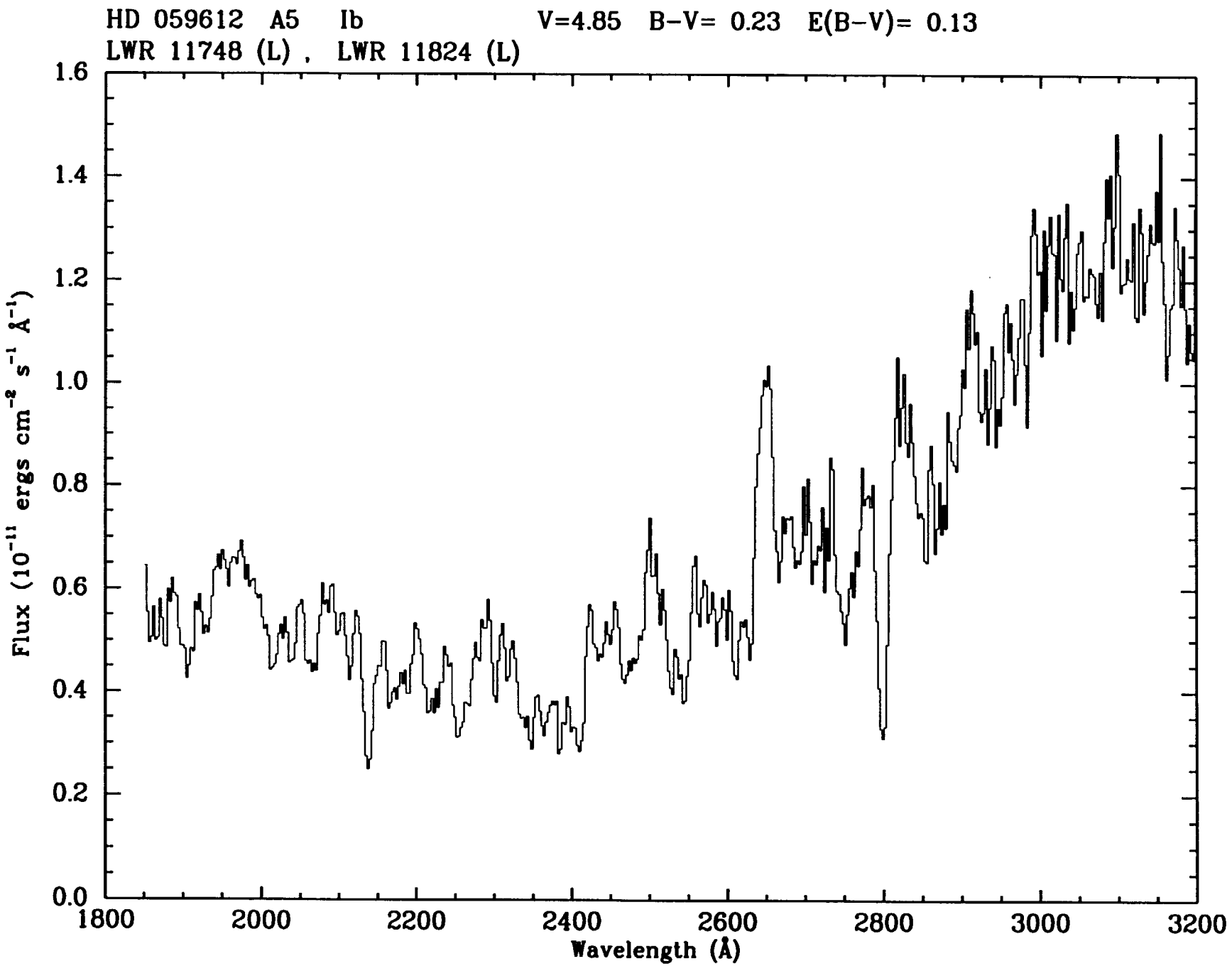
*** Low-Dispersion Merged Extracted Image (MXLO)**

Image	Ap	N	Exp	E/C/B
SWP15234(gif)(ps)(w_f)	L	T	139.848	---/100/26
SWP15318(gif)(ps)(w_f)	L	T	310.199	---/180/30
LWR11748(gif)(ps)(w_f)	L	T	79.135	---/180/26
LWR11824(gif)(ps)(w_f)	L	T	237.749	---/2X/28

*** Combined Image**

SWP15234,SWP15318 (gif)(ps)(w_f)
LWR11748,LWR11824 (gif)(ps)(w_f)


HD 059612 A5 Ib V=4.85 B-V= 0.23 E(B-V)= 0.13
SWP 15234 (L) , SWP 15318 (L)
Flux (10^{-12} ergs cm^{-2} s^{-1} Å^{-1})
Wavelength (Å)
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000


HD 059612 A5 Ib V=4.85 B-V= 0.23 E(B-V)= 0.13
LWR 11748 (L) , LWR 11824 (L)
Flux (10^{-11} ergs cm^{-2} s^{-1} Å^{-1})
Wavelength (Å)
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1800
2000
2200
2400
2600
2800
3000
3200

IUE Standard Stars Atlas (NEWSIPS)

HD 7312

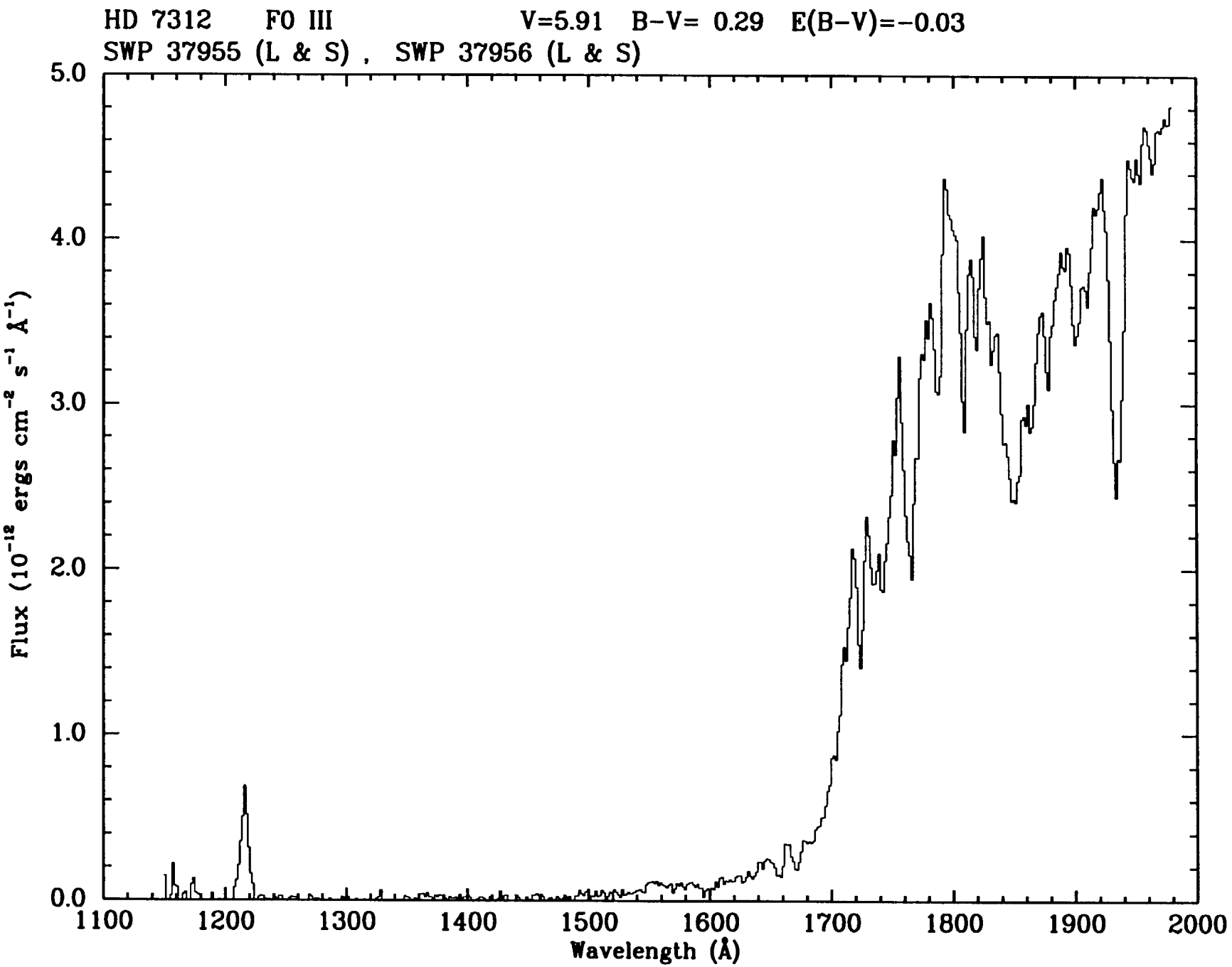
Sp_Type	RA	DEC	V	Rem	B-V	E(B-V)
F0 III	1:10:27.3	-38:07:15	5.91		0.29	-0.03

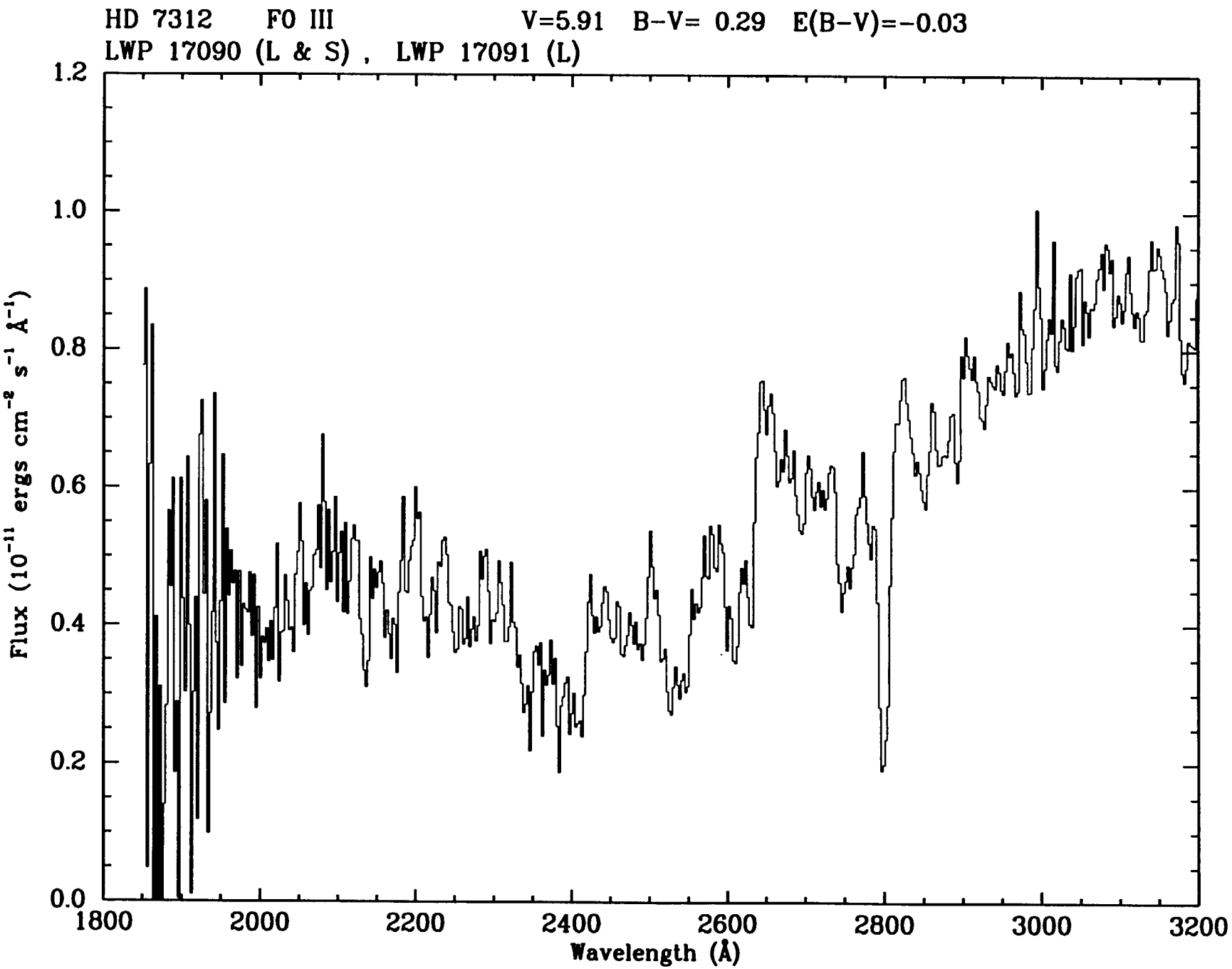
*** Low-Dispersion Merged Extracted Image (MXLO)**

Image	Ap	N	Exp	E/C/B
SWP37955(gif)(ps)(w_f)	L	3	3598.765	---/60X/34
	S	1	899.761	---/5X/36
SWP37956(gif)(ps)(w_f)	L	3	374.394	---/203/21
	S	1	119.473	---/107/24
LWP17090(gif)(ps)(w_f)	L	3	418.652	---/4X/28
	S	1	119.480	---/2X/25
LWP17091(gif)(ps)(w_f)	L	T	65.708	---/157/37

*** Combined Image**

SWP37955,SWP37956 (gif)(ps)(w_f)
LWP17090,LWP17091 (gif)(ps)(w_f)


HD 7312 F0 III V=5.91 B-V= 0.29 E(B-V)=-0.03
SWP 37955 (L & S) , SWP 37956 (L & S)
Flux (10^{-12} ergs cm^{-2} s^{-1} Å^{-1})
Wavelength (Å)
0.0
1.0
2.0
3.0
4.0
5.0
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000


HD 7312 F0 III V=5.91 B-V= 0.29 E(B-V)=-0.03
LWP 17090 (L & S) , LWP 17091 (L)
Flux (10^{-11} ergs cm^{-2} s^{-1} Å^{-1})
Wavelength (Å)
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1800
2000
2200
2400
2600
2800
3000
3200

IUE Standard Stars Atlas (NEWSIPS)

HD 193901

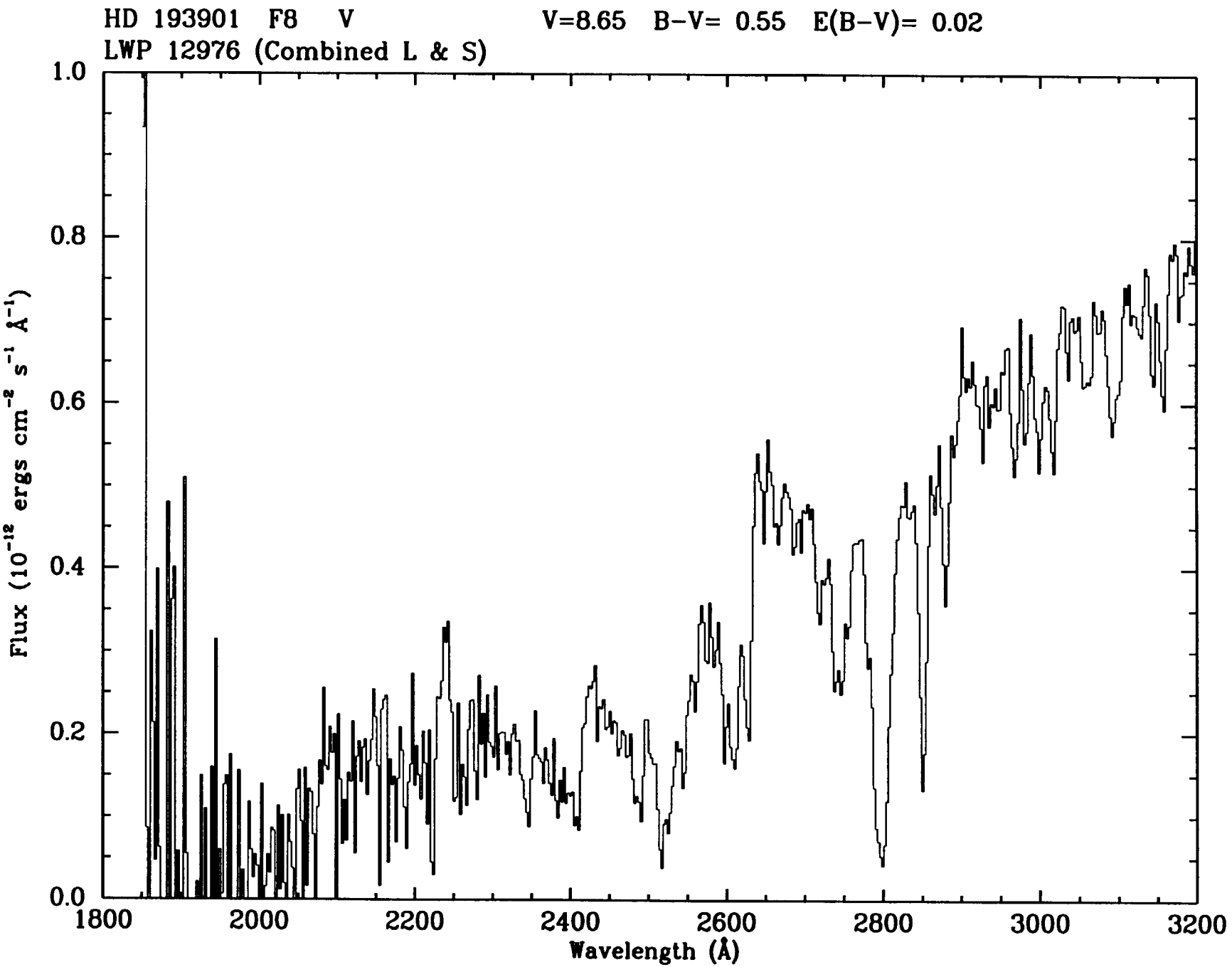
Sp_Type	RA	DEC	V	Rem	B-V	E(B-V)
F8 V	20:20:38.8	-21:31:05	8.65		0.55	0.02

*** Low-Dispersion Merged Extracted Image (MXLO)**

Image	Ap	N	Exp	E/C/B
LWP12976(gif)(ps)(w_f)	L	3	899.113	---/231/46
	S	1	299.704	---/---/42

*** Combined Image**

LWP12976(gif)(ps)(w_f)


HD 193901 F8 V
V=8.65 B-V= 0.55 E(B-V)= 0.02
LWP 12976 (Combined L & S)
1.0
0.8
0.6
0.4
0.2
0.0
Flux (10^{-12} ergs cm^{-2} s^{-1} Å^{-1})
1800
2000
2200
2400
2600
2800
3000
3200
Wavelength (Å)

IUE Standard Stars Atlas (NEWSIPS)

HD 2151
BET HYI

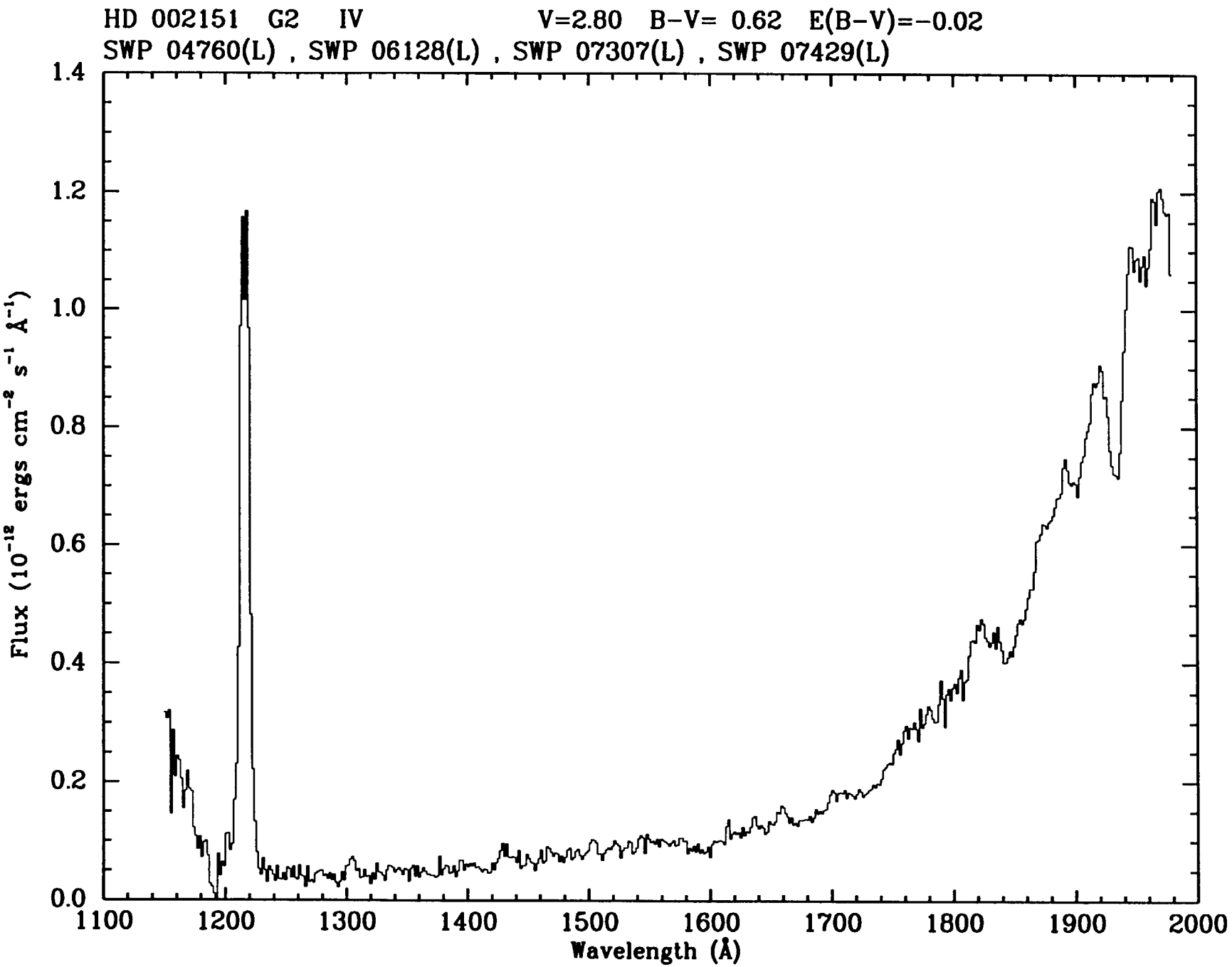
Sp_Type	RA	DEC	V	Rem	B-V	E(B-V)
G2 IV	0:23:09.3	-77:32:08	2.80		0.62	-0.02

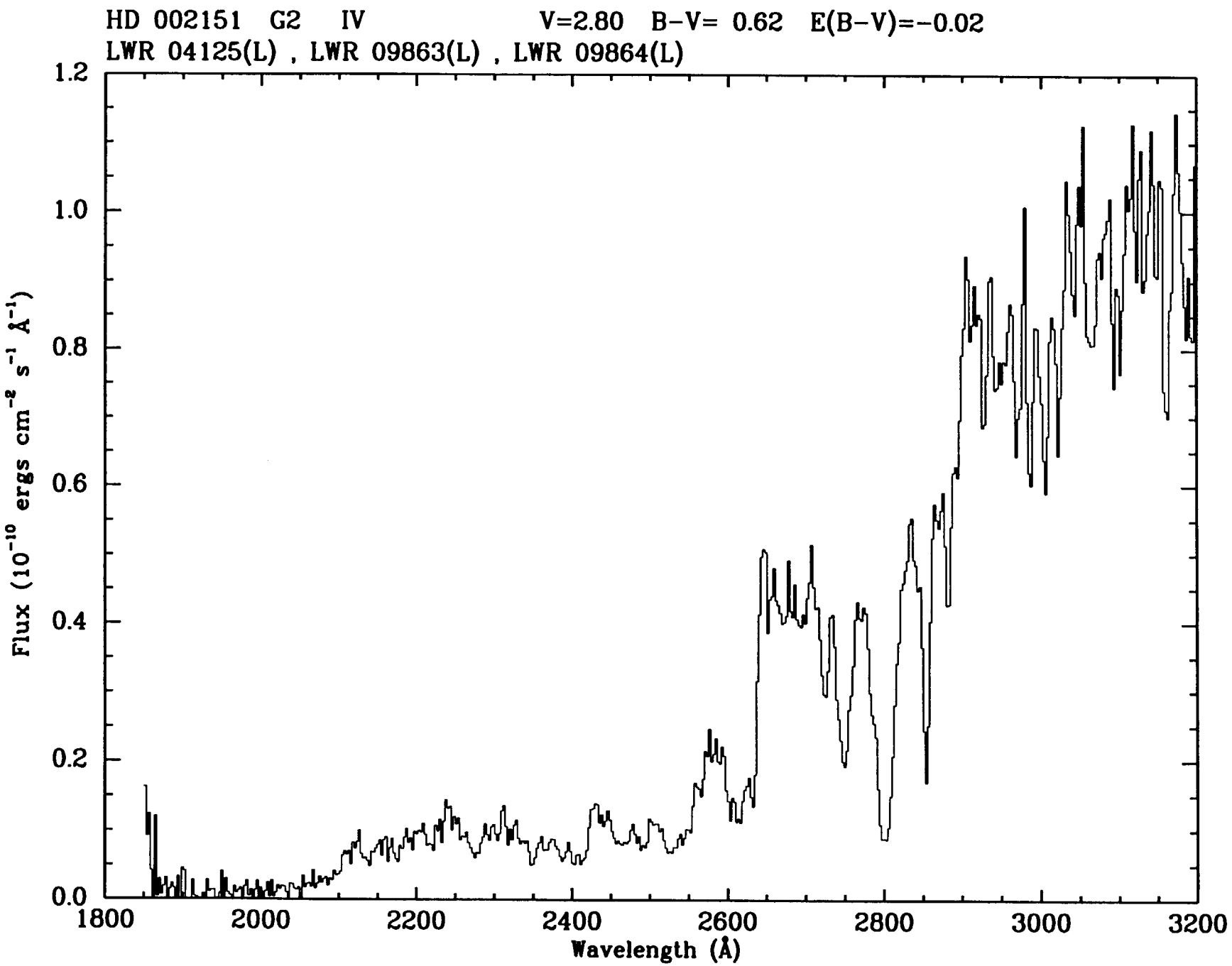
*** Low-Dispersion Merged Extracted Image (MXLO)**

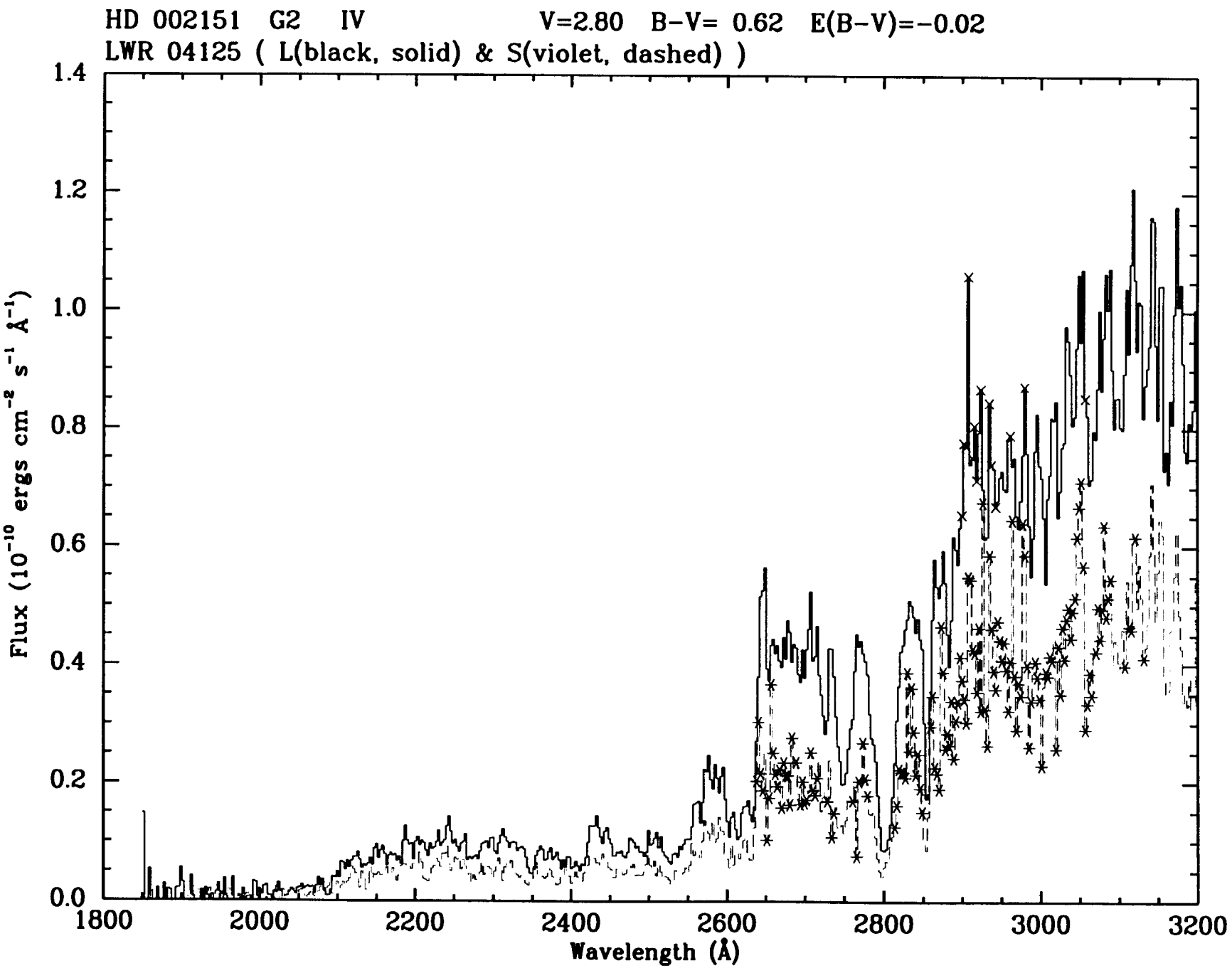
Image	Ap	N	Exp	E/C/B
SWP04760(gif)(ps)(w_f)	L	T	673.535	MAXDN=105
	S	1	599.524	MAXDN=125
SWP06128(gif)(ps)(w_f)	L	1	1019.774	---/1-5X/55
	S	1	179.684	---/90/60
SWP07307(gif)(ps)(w_f)	L	1	4799.563	---/8X/45
	S	1	599.524	---/120/45
SWP07429(gif)(ps)(w_f)	L	1	719.537	229/180/25
LWR04125(gif)(ps)(w_f)	L	T	22.567	MAXDN=265
	S	1	14.620	MAXDN=1.5-2X
LWR09863(gif)(ps)(w_f)	L	T	18.049	---/255/25
LWR09864(gif)(ps)(w_f)	L	T	16.073	---/245/25

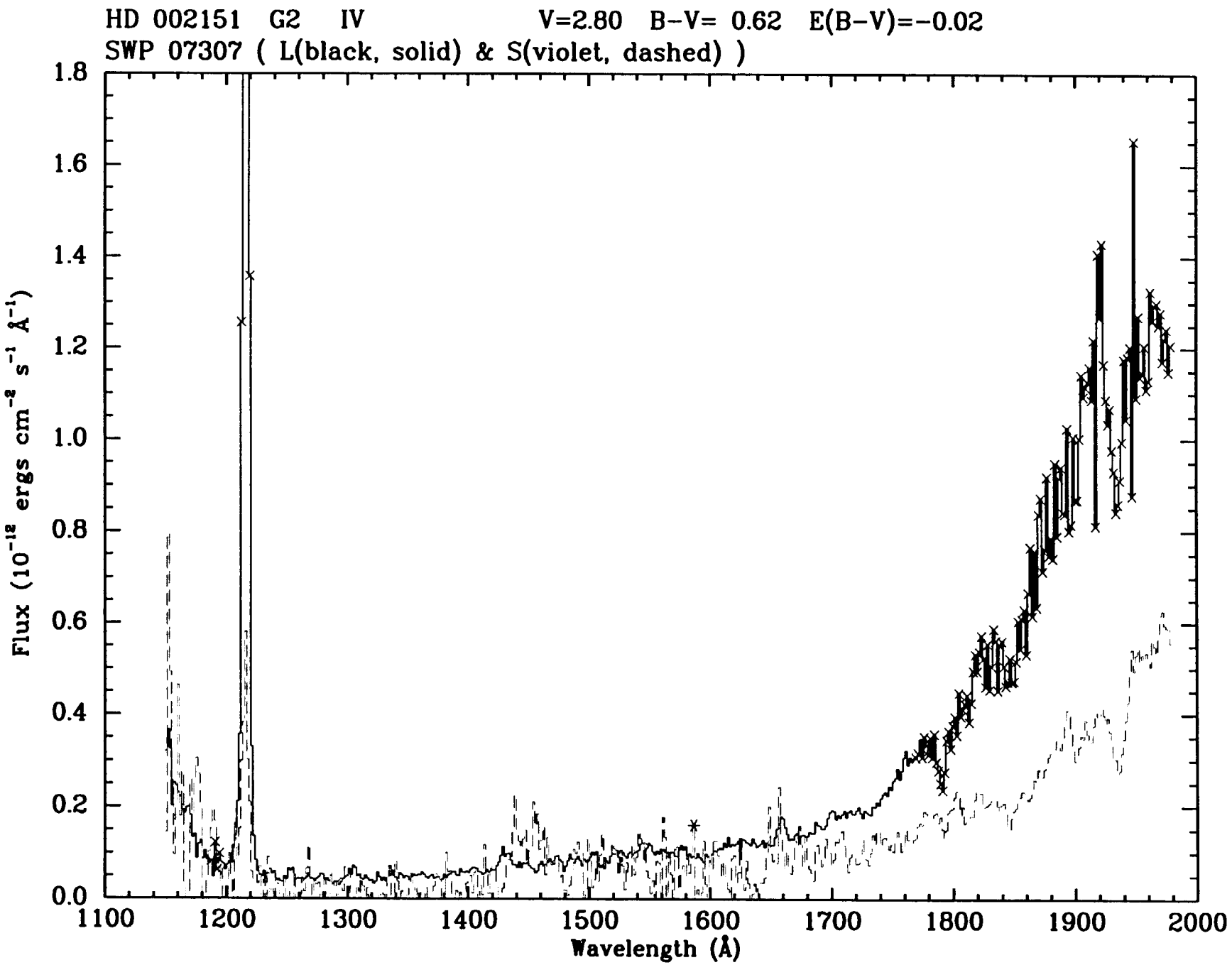
*** Combined Image**

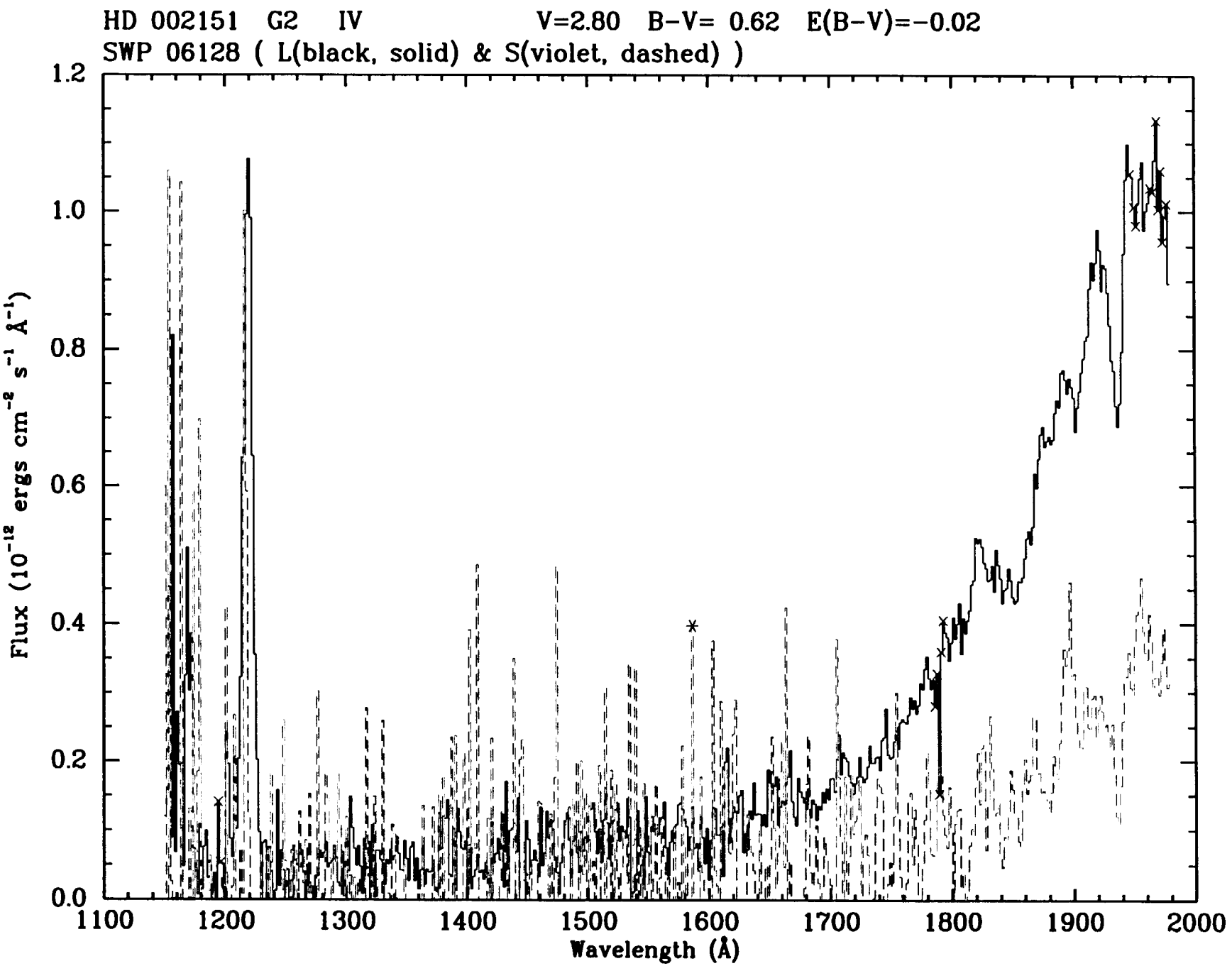
SWP04760,SWP06128,SWP07307,SWP07429(gif)(ps)(w_f)
LWR04125,LWR09863,LWR09864 (gif)(ps)(w_f)

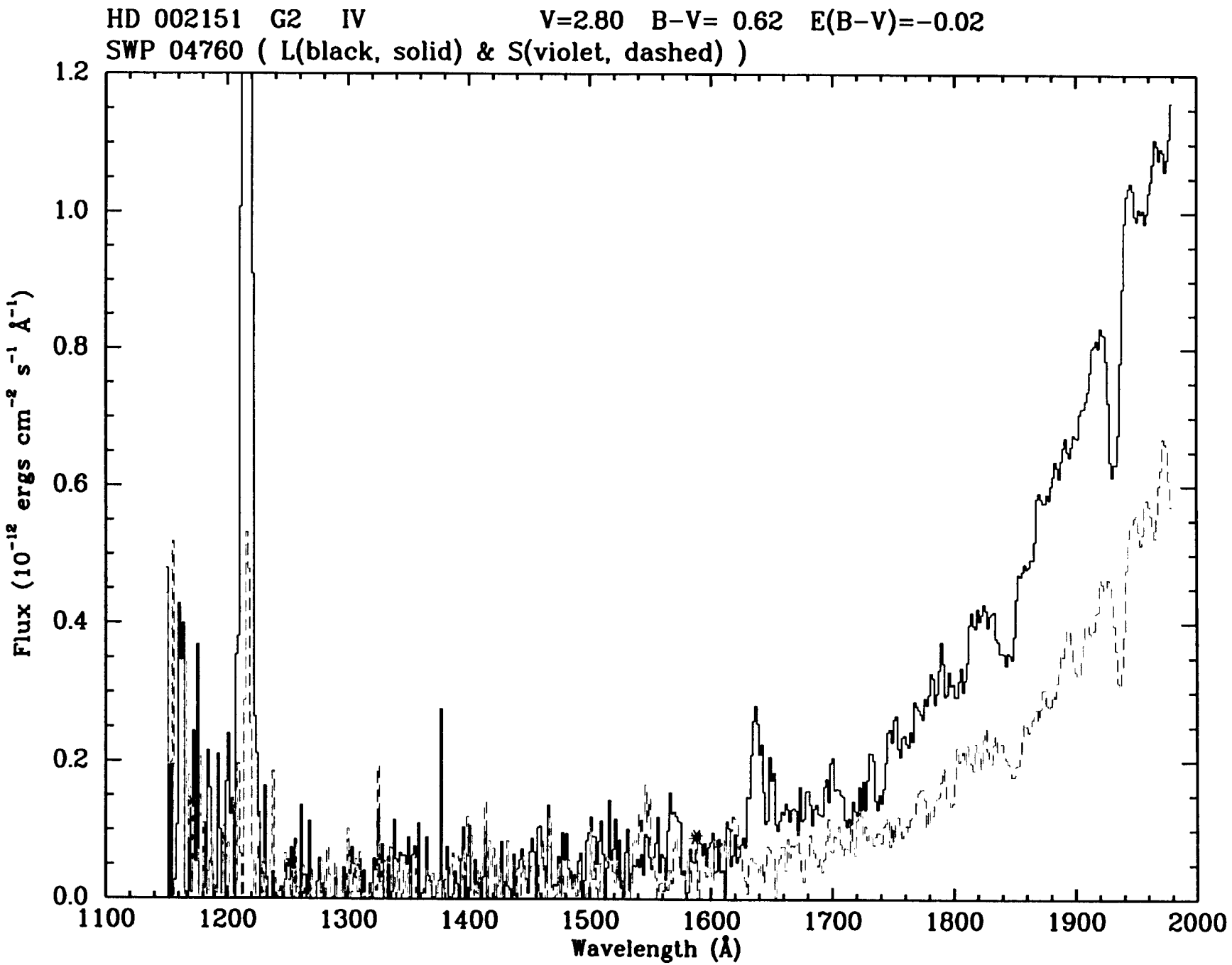

HD 002151 G2 IV V=2.80 B-V= 0.62 E(B-V)=-0.02
SWP 04760(L) , SWP 06128(L) , SWP 07307(L) , SWP 07429(L)
Flux (10^{-12} ergs cm^{-2} s^{-1} Å^{-1})
Wavelength (Å)
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000


HD 002151 G2 IV V=2.80 B-V= 0.62 E(B-V)=-0.02
LWR 04125(L) , LWR 09863(L) , LWR 09864(L)
Flux (10^{-10} ergs cm^{-2} s^{-1} Å^{-1})
Wavelength (Å)
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1800
2000
2200
2400
2600
2800
3000
3200


HD 002151 G2 IV V=2.80 B-V= 0.62 E(B-V)=-0.02
LWR 04125 (L(black, solid) & S(violet, dashed))
Flux (10^{-10} ergs cm^{-2} s^{-1} Å^{-1})
Wavelength (Å)
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1800
2000
2200
2400
2600
2800
3000
3200


HD 002151 G2 IV V=2.80 B-V= 0.62 E(B-V)=-0.02
SWP 07307 (L(black, solid) & S(violet, dashed))
Flux (10^{-12} ergs cm^{-2} s^{-1} Å^{-1})
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000
Wavelength (Å)


HD 002151 G2 IV V=2.80 B-V= 0.62 E(B-V)=-0.02
SWP 06128 (L(black, solid) & S(violet, dashed))
Flux (10^{-12} ergs cm^{-2} s^{-1} Å^{-1})
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000
Wavelength (Å)


HD 002151 G2 IV V=2.80 B-V= 0.62 E(B-V)=-0.02
SWP 04760 (L(black, solid) & S(violet, dashed))
Flux (10^{-12} ergs cm^{-2} s^{-1} Å^{-1})
Wavelength (Å)
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000

IUE Standard Stars Atlas (NEWSIPS)

HD 62509
BET GEM

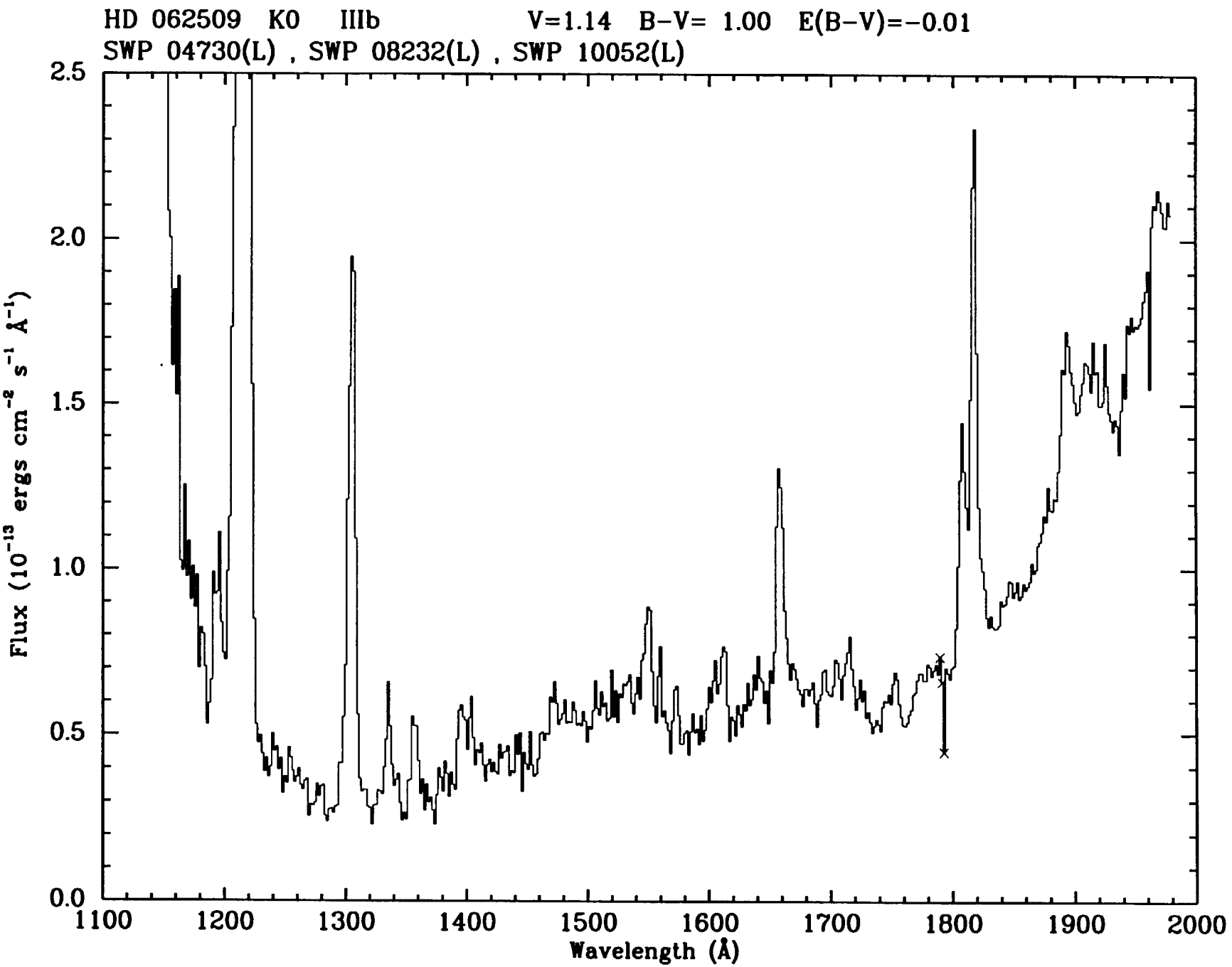
Sp_Type		RA	DEC	V	Rem	B-V	E(B-V)
K0	IIIb	7:42:15.5	28:08:55	1.14	AC	1.00	-0.01

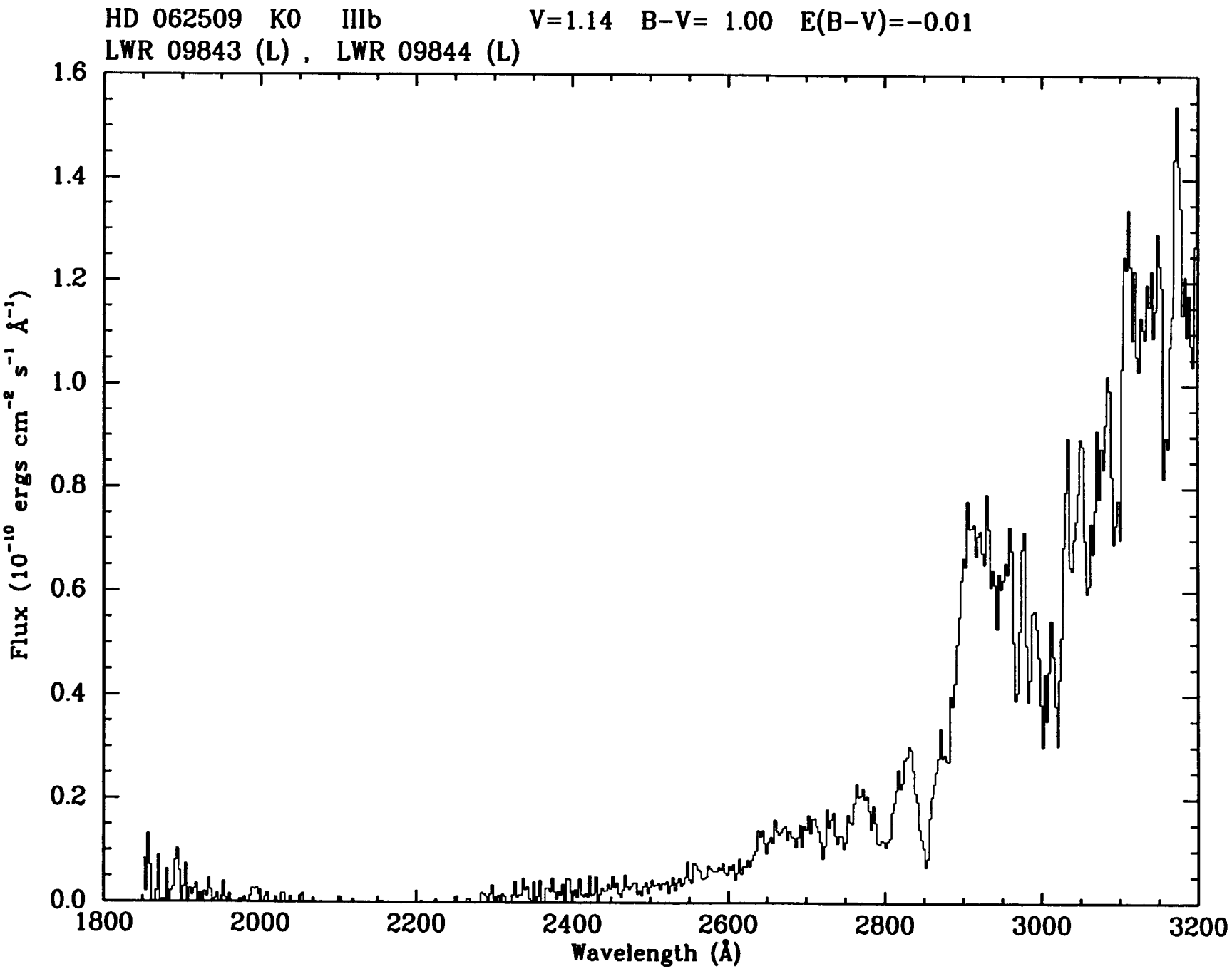
*** Low-Dispersion Merged Extracted Image (MXLO)**

Image	Ap	N	Exp	E/C/B
SWP04730(gif)(ps)(w_f)	L	1	1199.588	MAXDN=100
SWP08232(gif)(ps)(w_f)	L	1	7199.819	1.5X/2X/40
	S	1	1499.825	83/110/40
SWP10052(gif)(ps)(w_f)	L	1	2399.717	1.75
LWR09843(gif)(ps)(w_f)	L	T	6.766	---/110/28
LWR09844(gif)(ps)(w_f)	L	T	15.785	---/200/25
LWR09845(gif)(ps)(w_f)	L	T	132.894	---/3X/25

*** Combined Image**

SWP04730,SWP08232,SWP10052 (gif)(ps)(w_f)
LWR09843,LWR09844 (gif)(ps)(w_f)


HD 062509 K0 IIIb V=1.14 B-V= 1.00 E(B-V)=-0.01
SWP 04730(L) , SWP 08232(L) , SWP 10052(L)
Flux (10^{-13} ergs cm^{-2} s^{-1} Å^{-1})
Wavelength (Å)
0.0
0.5
1.0
1.5
2.0
2.5
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000


HD 062509 K0 IIIb V=1.14 B-V= 1.00 E(B-V)=-0.01
LWR 09843 (L) , LWR 09844 (L)
Flux (10^{-10} ergs cm^{-2} s^{-1} Å^{-1})
Wavelength (Å)
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1800
2000
2200
2400
2600
2800
3000
3200

IUE Standard Stars Atlas (NEWSIPS)

HD 146051
DEL OPH

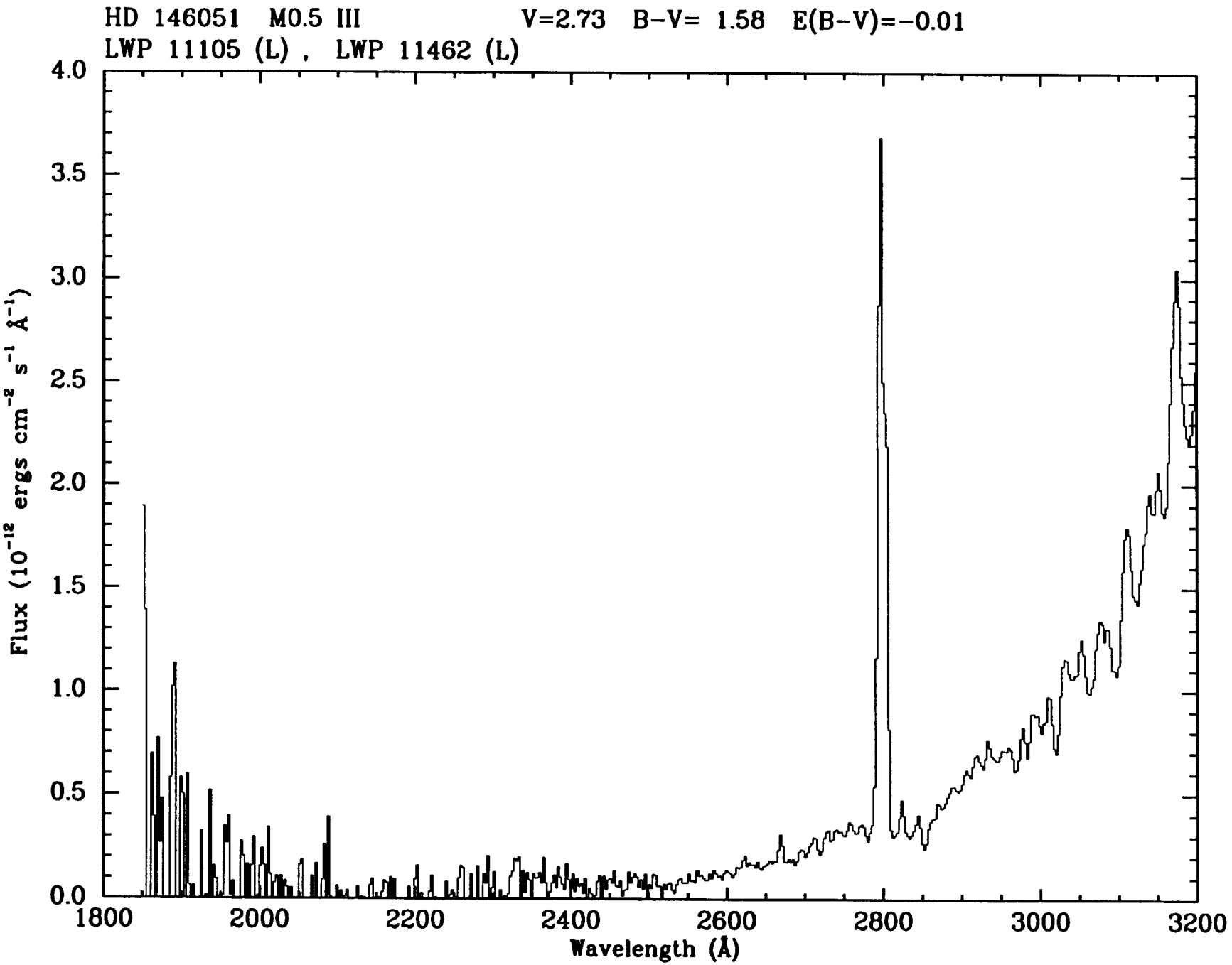
Sp_Type	RA	DEC	V	Rem	B-V	E(B-V)
M0.5 III	16:11:43.3	-3:34:01	2.73	A	1.58	-0.01

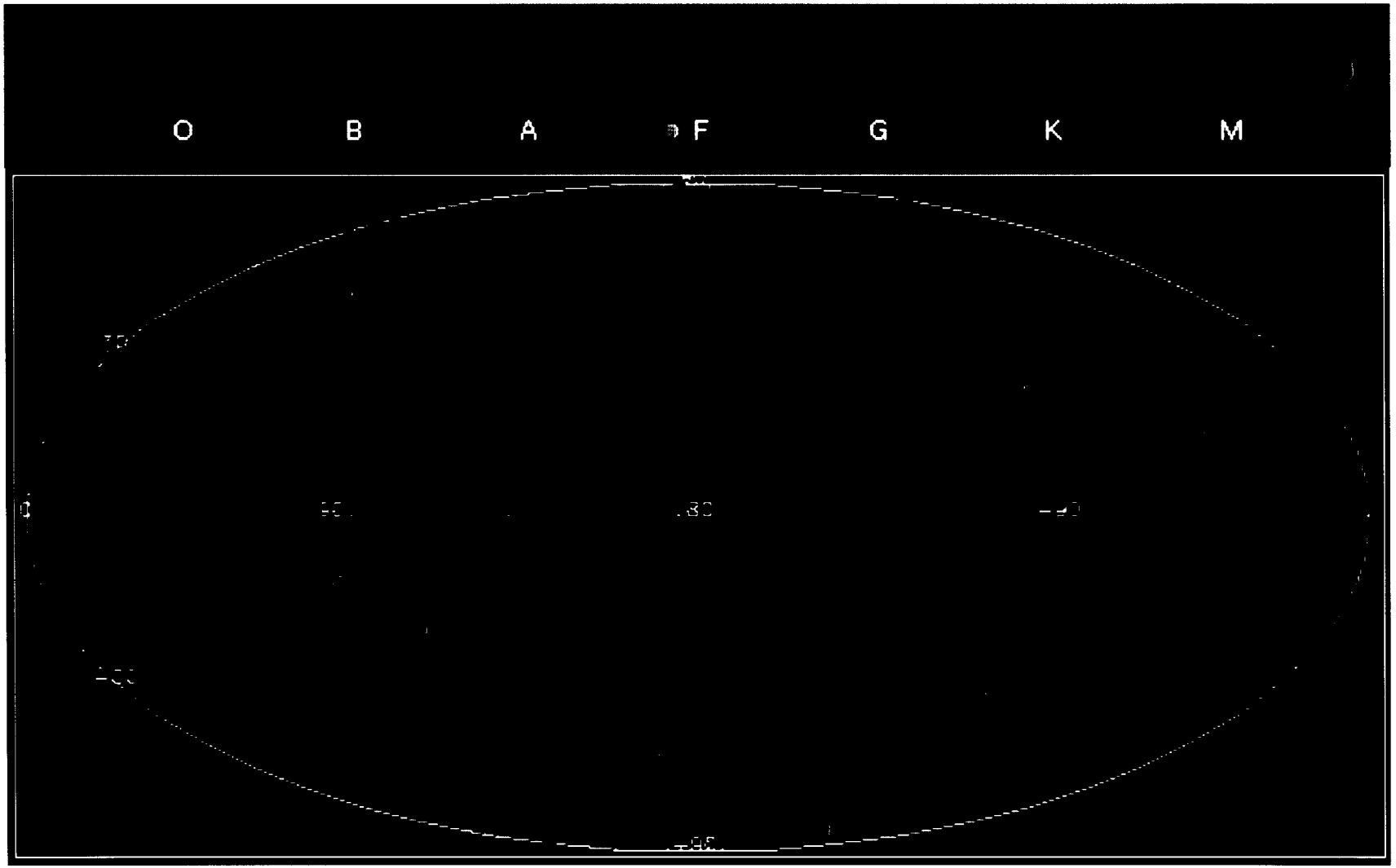
*** Low-Dispersion Merged Extracted Image (MXLO)**

Image	Ap	N	Exp	E/C/B
LWP11105(gif)(ps)(w_f)	L	T	366.507	1.2X/102/34
LWP11462(gif)(ps)(w_f)	L	T	220.516	195/75/35

*** Combined Image**

LWP11105,LWP11462 (gif)(ps)(w_f)


HD 146051 M0.5 III V=2.73 B-V= 1.58 E(B-V)=-0.01
LWP 11105 (L) , LWP 11462 (L)
Flux (10^{-12} ergs cm^{-2} s^{-1} Å^{-1})
Wavelength (Å)
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1800
2000
2200
2400
2600
2800
3000
3200


O
B
A
F
G
K
M