IUE Image Processing News

Cathy Imhoff
June 28, 1993

1. New Wavelength Calibration in IUESIPS

We have recently updated the wavelength calibration which is used in IUESIPS processing. All data which have been processed after June 10, 1993, at 18:57 U.T. at Goddard utilize the new wavelength calibration. VILSPA also implemented the new wavelength calibration on June 11, at 0:00 UT.

A description of the new calibration by Matt Garhart is included in this newsletter. The LWP wavelength scales are changed very little. For 1993 SWP high dispersion data, old = new + 16 km/sec. For 1993 SWP low dispersion data, old = new - 1.5 Å.

The previous wavelength calibration update was on October 13, 1987 (Thompson, 1988, *NASA IUE Newsletter* No. 35, pg. 133). A later wavelength calibration (Garhart, 1991, *NASA IUE Newsletter* No. 46, pg. 31) was not implemented into IUESIPS due to technical problems (Imhoff, 1993, *NASA IUE Newsletter* No. 50, pg. 14).

You can correct the wavelength scale of your data by using the IUEDAC routine DCCOR (Thompson, 1988, *NASA IUE Newsletter* No. 35, pg. 133). If a very accurate wavelength scale is important for your analysis, the images should be processed consistently and with an up-to-date calibration. If needed, the data can be reprocessed with the new wavelength calibration. If you'd like us to reprocess the data, please send a request and list of the images to Dr. Don West, Code 684, NASA GSFC, Greenbelt, MD 20771 for his approval. To expedite handling you may also want to send or e-mail a copy of your request to me (imhoff@iuegtc.dnet.nasa.gov).

2. Final Archive Reprocessing Begins

On May 20, 1993, the IPC began reprocessing SWP low dispersion data through the NEWSIPS system. The system incorporates the many improvements that have been described in previous newsletters. It also makes use of the enlarged and verified data base created by the Core Data Item Verification System (CDIVS; see Imhoff and Meylan, 1993, *NASA IUE Newsletter*, No. 50, pg. 14). The results are written as FITS files. We have started sending data to NSSDC, where the files will be placed

into the NDADS system. They are not yet accessible to users, but should be soon. In any case, it will be a few months before most of the SWP low dispersion images have been reprocessed. Once we have completed the SWP low dispersion data, we expected to start reprocessing the LWP and LWR data. The high dispersion data will be reprocessed after that. Please note that at present only the data before 1990 are being reprocessed. The later images will also reprocessed at some point.

The FITS headers for the Final Archive data contain an extensive set of keywords, transcribed from the IUE data base, to describe the data. A FITS header consists of the following sets of keywords:

- Standard FITS keywords
- IUE keywords (Core Data Items) describing the image
- Comments from the script, other information
- IUE keywords (Core Data Items) describing each exposure (large and/or small aperture) in the image
- The original IUESIPS header stored as a Comment (the binary portion stored as hexadecimal)
- The NEWSIPS processing history

Sample FITS headers for the SILO file (roughly analogous to the line-by-line file) and the MXLO file (the fully extracted and calibrated file) follow. These are the files that users will most often make use of. The other files are the RILO (raw image), VDLO (vector displacements), and LILO (photometrically corrected). Note that the SILO file consists of the primary data array plus an image extension which consists of the ν (quality) flags, analogous to the IUESIPS ϵ flags. The MXLO file contains the extracted data in a binary table extension. The IUEDAC (formerly the RDAF) has written IDL software to read the new files.

A new Image Processing Information Manual for the NEWSIPS processing is being written by the developers of the software. We hope to make it available to users in the near future.

Stay tuned for further updates!

FITS HEADER FOR SWP17072.SILO

```
SIMPLE  =                    T / Standard FITS Format
BITPIX  =                   16 / 16-bits 2's complement pixels
NAXIS   =                    2 / Two-dimensional image
NAXIS1  =                  640 / Dimension along x-axis
NAXIS2  =                   80 / Dimension along y-axis
EXTEND  =                    T / Extensions are present
CRPIX1  =                   1. / x reference pixel
CRPIX2  =                   1. / y reference pixel
CRVAL1  =              1050.00 / Wavelength at reference pixel
CRVAL2  =                   1. / Coordinate of CRPIX2
CDELT1  =              1.67634 / Increment in wavelengths
CDELT2  =                   1. / Increment unit along y-axis
CTYPE1  = 'WAVELENGTH'         / Units along x-axis
CTYPE2  = 'SCAN    '           / Units along y-axis
BUNIT   = 'FN      '           / Flux numbers
BSCALE  =          3.1250E-02 / real=tape*bscale+bzero
BZERO   =                   0. / Pixel offset
TELESCOP= 'IUE     '           / International Ultraviolet Explorer
FILENAME= 'SWP17072.SILO'      / Filename(camera)(number).SILO
DATE    = '25/06/93'           / Date file was written
ORIGIN  = 'GSFC    '           / Institution generating the file
DATAMIN =                -44.3 / Minimum pixel value
DATAMAX =                596.9 / Maximum pixel value
COMMENT *
COMMENT * CORE DATA ITEMS - COMMON SET
COMMENT *
CAMERA  = 'SWP     '           / Camera
IMAGE   =                17072 / Sequential image number
DISPERSN= 'LOW     '           / Spectrograph dispersion mode
APERTURE= 'BOTH    '           / Aperture
DISPTYPE= 'LOW     '           / Dispersion processing type
READMODE= 'FULL    '           / Read mode
READGAIN= 'LOW     '           / Read gain
EXPOGAIN= 'MAXIMUM '           / Exposure gain
UVC-VOLT=                 -5.0 / UVC voltage
ABNNOSTD= 'NO      '           / Non-standard image acquisition
ABNBADSC= 'NO      '           / LWP bad scans
ABNHTRWU= 'NO      '           / LWR heater warmup
ABNREAD = 'NO      '           / Read at other than 20 KB
ABNUVC  = 'NO      '           / Non-standard UVC voltage
ABNHISTR= 'NO      '           / History replay
ABNOTHER= 'NO      '           / Other abnormality
THDAREAD=                 6.49 / THDA at read of image
EQUINOX =              1950.00 / Epoch of coordinates
STATION = 'GSFC    '           / Observing station
ORBEPOCH= '26/05/82'           / Orbital elements epoch
ORBSAXIS=             42169.1 / Semi-major axis in kilometers
ORBECCEN=           0.2242648 / Eccentricity
ORBINCLI=              28.457 / Inclination in degrees
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ORBASCEN=              174.369 / Ascending node in degrees
ORBPERIG=              290.114 / Argument of perigee in degrees
ORBANOMA=               77.834 / Mean anomaly in degrees
POSANGLE=                30.54 / Pos angle of the large aperture (deg)
LAMP    = 'NONE    '           / Lamp
PGM-ID  = 'PHCAL   '           / Program identification
ABNMINFR= 'NO      '           / Bad/missing minor frames
CC-PERCN=                 87.7 / Cross-correlation % successful
CC-WINDW=                   29 / Cross-correlation window size
CC-TEMPL=                   23 / Cross-correlation template size
CC-MEDN =                0.404 / Median cross-correlation coefficient
CC-STDEV=                0.139 / St dev of cross-corr coefficients
SHFTMEAN=                0.510 / Mean shift between image and ITF
SHFTMAX =                1.380 / Maximum shift between image and ITF
ITF     = 'SWP85R92A'          / ITF identification
TILTCORR= 'NO      '           / Tilt correction flag
MEANRAT =                1.004 / SI vs LI mean
STDEVRAT=                0.988 / SI vs LI standard deviation
COMMENT BY RA:  EXP 1 APER L C=160,B=21
COMMENT BY RA:  EXP 2 APER S C=220,B=21
COMMENT BY RA:     0 MISSING MINOR FRAMES NOTED ON SCRIPT
COMMENT BY RA:  EXP 1 TRACKED ON GYROS
COMMENT BY RA:  EXP 2 TRACKED ON GYROS
COMMENT BY RA:  S   PREP USED
COMMENT *
COMMENT * CORE DATA ITEMS - LARGE APERTURE SET
COMMENT *
LDATEOBS= '30/05/82'           / Observing date
LTIMEOBS= '20:44:23'           / Observing time
LMJD-OBS=          45119.86416 / Mod. JD start of obs. (JD - 2400000.5)
LEXPTRMD= 'NO-TRAIL'           / Trail mode
LEXPMULT= 'NO      '           / Multiple exposure mode
LEXPSEGM= 'NO      '           / Segmented exposure code
LEXPTIME=                9.700 / Integration time in seconds
LTHDASTR=                 6.50 / THDA at start of exposure
LTHDAEND=                 6.49 / THDA at end of exposure
LRA     =             113.0339 / Homogeneous R.A. in degrees
LDEC    =             -50.4747 / Homogeneous Dec. in degrees
LLAPSTAT= 'OPEN    '           / Large aperture status
LFES2MD = 'FO      '           / FES(2) mode
LFES2CN =                 7621 / FES(2) counts on target
LTARGET = 'HD 60753'           / Object as given by Guest Observer
LTARGRA =             113.0338 / R.A. in degrees (given by GO)
LTARGDEC=             -50.4747 / Dec. in degrees (given by GO)
LOBJECT = 'HD  60753'                    / Homogeneous Object ID
LIUECLAS=                  21 / Object class
LFOCUS  =               -1.07 / Focus
LFPM    =                2.88 / Flux particle monitor
LGSTAR2M= 'NO      '           / Guide star mode FES2
LMJD-MID=          45119.86421 / Mod. JD middle of obs. (JD - 2400000.5)
LHELCORR=              -.00074 / Heliocentric corr to midpoint (days)
LDATABKG=                  24 / Estimated mean background level (DNs)
LDATACNT=                 142 / Estimated maximum continuum level (DNs)
LCNTRAPR=                51.0 / Predicted center line of spectrum
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LXTRMODE= 'POINT   '           / Extraction mode
LXTRPROF= 'EMPIRICAL'          / Profile used
LXTRASYM= 'NO      '           / Asymmetrical profile in extraction
LXTRCNTR=                 50.7 / Center line of extracted spectrum
LFLUXAVE=                122.3 / Average flux (FNs)
COMMENT *
COMMENT * CORE DATA ITEMS - SMALL APERTURE SET
COMMENT *
SDATEOBS= '30/05/82'           / Observing date
STIMEOBS= '20:48:59'           / Observing time
SMJD-OBS=          45119.86735 / Mod. JD start of obs. (JD - 2400000.5)
SEXPTRMD= 'NO-TRAIL'           / Trail mode
SEXPMULT= 'NO      '           / Multiple exposure mode
SEXPSEGM= 'NO      '           / Segmented exposure code
SEXPTIME=                29.771 / Integration time in seconds
STHDASTR=                  6.50 / THDA at start of exposure
STHDAEND=                  6.49 / THDA at end of exposure
SRA     =             113.0339 / Homogeneous R.A. in degrees
SDEC    =             -50.4747 / Homogeneous Dec. in degrees
SLAPSTAT= 'OPEN    '           / Large aperture status
SFES2MD = 'FO      '           / FES(2) mode
SFES2CN =                  7717 / FES(2) counts on target
STARGET = 'HD 60753'           / Object as given by Guest Observer
STARGRA =             113.0338 / R.A. in degrees (given by GO)
STARGDEC=             -50.4747 / Dec. in degrees (given by GO)
SOBJECT = 'HD  60753'                  / Homogeneous Object ID
SIUECLAS=                   21 / Object class
SFOCUS  =                -1.07 / Focus
SFPM    =                 2.78 / Flux particle monitor
SGSTAR2M= 'NO      '           / Guide star mode FES2
SMJD-MID=          45119.86752 / Mod. JD middle of obs. (JD - 2400000.5)
SHELCORR=              -.00074 / Heliocentric corr to midpoint (days)
SDATABKG=                   24 / Estimated mean background level (DNs)
SDATACNT=                  192 / Estimated maximum continuum level (DNs)
SCNTRAPR=                 24.9 / Predicted center line of spectrum
SXTRMODE= 'POINT   '           / Extraction mode
SXTRPROF= 'EMPIRICAL'          / Profile used
SXTRASYM= 'NO      '           / Asymmetrical profile in extraction
SXTRCNTR=                 24.7 / Center line of extracted spectrum
SFLUXAVE=                205.6 / Average flux (FNs)
COMMENT *
COMMENT * THE IUE VICAR HEADER
COMMENT *
COMMENT IUE-VICAR HEADER START
                                  1   1 768 768   1 2 013117072          1  C
  3838*   2*IUESOC  *   *   *    40*      *   *  * * * * * *    *  2  C
SWP 17072, HD 60753, 10 SEC LGAP/30 SEC SMAP EXPOS, LO DISP          3  C
                                                                      4  C
                                                                      5  C
OBSERVER: CATHY IMHOFF   PROGRAM: PHCAL   1982/150/30 MAY            6  C
                                                                      7  C
                                                                      8  C
                                                                      9  C
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82150205918* 9    * 218 *OPSPRC29*195026 X 56 Y 72 G1 99 HT 106    * 10  C
205921 READ 3 IMAGE 17072        *201311 TLM,SWPROM                * 11  C
210001 SCAN READLO SS 1 G3 44    *201538 SPREP 3                   * 12  C
210014 X 60 Y 76 G1 82 HT 105    *202835 TLM,FES2ROM               * 13  C
205953                           *202918 MODE LWL                  * 14  C
210013                           *203601 FESIMAGE 0 0 81           * 15  C
185819 EXPOBC 2 9 0    MAXG NOL  *204337 TARGET IN SWLA            * 16  C
190431 TLM,LWRROM                *204428 EXPOBC 3 0 10   MAXG NOL  * 17  C
190726 FIN 2 T 539 S 98 U 109    *204503 FIN 3 T 9 S 97 U 109      * 18  C
190805 TARGET FROM LWLA          *204546 TARGET FROM SWLA          * 19  C
190821 READPREP 2 IMAGE 13354    *204805 TARGET IN SWSA            * 20  C
191248 SCAN READLO SS 1 G3 58    *204902 EXPOBC 3 0 30   MAXG NOL  * 21  C
191305 X 56 Y 72 G1 99 HT 106    *204942 FIN 3 T 39 S 97 U 109     * 22  C
193247 TLM,FES2ROM               *205020 TARGET FROM SWSA          * 23  C
193512 TARGET IN LWLA            *205212 TARGET IN LWLA            * 24  C
193633 FESTRK TRACKING           *205304 EXPOBC 2 0 7    MAXG NOL  * 25  C
193732 EXPOBC 2 6 40   MAXG NOL  *205344 FIN 2 T 6 S 98 U 109      * 26  C
194134 TLM,LWRROM                *205425 TARGET FROM LWLA          * 27  C
194414 FIN 2 T 399 S 98 U 109    *205603 TARGET IN LWSA            * 28  C
194451 TARGET FROM LWLA          *205702 EXPOBC 2 0 21   MAXG NOL  * 29  C
194522 S/C READY FOR MANEUVER    *205745 FIN 2 T 27 S 98 U 109     * 30  C
194540 READPREP 2 IMAGE 13355    *205831 TARGET FROM LWSA          * 31  C
195006 SCAN READLO SS 1 G3 58    *205853 TLM,SWPROM                * 32  C
                                                                     33  C
                                                                     34  C
                                                                     35  C
PHCAL*1*02*CATHY IMHOFF    * 14*   *H*00060753*0*0*1* 21           36  C
 732 81-502829*999*B3*4* 6.7* 0.11*         *    * 999.99*   *     37  C
                                                                     38  C
                                                                     39  C
                                                                     40  C
                                                                     41  C
                                                                     42  C
                                                                     43  C
                                                                     44  C
                                                                     45  C
20202020202020202020202020202020202020202020202020202020202020202020 46  C
20202020202020202020202020202020202020202020202020202020202020203420 46  C
                                                                     47  C
                                                                     48  C
                                                                     49  C
                                                                     50  C
20202020202020202020202020202020202020202020202020202020202020202020 51  C
20202020202020202020202020202020202020202020202020202020202020203520 51  C
20202020202020202020202020202020202020202020202020202020202020202020 52  C
20202020202020202020202020202020202020202020202020202020202020203520 52  C
20202020202020202020202020202020202020202020202020202020202020202020 53  C
20202020202020202020202020202020202020202020202020202020202020203520 53  C
20202020202020202020202020202020202020202020202020202020202020202020 54  C
20202020202020202020202020202020202020202020202020202020202020203520 54  C
20202020202020202020202020202020202020202020202020202020202020202020 55  C
20202020202020202020202020202020202020202020202020202020202020203520 55  C
20202020202020202020202020202020202020202020202020202020202020202020 56  C
20202020202020202020202020202020202020202020202020202020202020203520 56  C
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20202020202020202020202020202020202020202020202020202020202020202020 57  C
20202020202020202020202020202020202020202020202020202020202020203520 57  C
20202020202020202020202020202020202020202020202020202020202020202020 58  C
20202020202020202020202020202020202020202020202020202020202020203520 58  C
20202020202020202020202020202020202020202020202020202020202020202020 59  C
20202020202020202020202020202020202020202020202020202020202020203520 59  C
20202020202020202020202020202020202020202020202020202020202020202020 60  C
20202020202020202020202020202020202020202020202020202020202020203620 60  C
20202020202020202020202020202020202020202020202020202020202020202020 61  C
20202020202020202020202020202020202020202020202020202020202020203620 61  C
20202020202020202020202020202020202020202020202020202020202020202020 62  C
20202020202020202020202020202020202020202020202020202020202020203620 62  C
20202020202020202020202020202020202020202020202020202020202020202020 63  C
20202020202020202020202020202020202020202020202020202020202020203620 63  C
20202020202020202020202020202020202020202020202020202020202020202020 64  C
20202020202020202020202020202020202020202020202020202020202020203620 64  C
20202020202020202020202020202020202020202020202020202020202020202020 65  C
20202020202020202020202020202020202020202020202020202020202020203620 65  C
20202020202020202020202020202020202020202020202020202020202020202020 66  C
20202020202020202020202020202020202020202020202020202020202020203620 66  C
20202020202020202020202020202020202020202020202020202020202020202020 67  C
20202020202020202020202020202020202020202020202020202020202020203620 67  C
20202020202020202020202020202020202020202020202020202020202020202020 68  C
20202020202020202020202020202020202020202020202020202020202020203620 68  C
20202020202020202020202020202020202020202020202020202020202020202020 69  C
20202020202020202020202020202020202020202020202020202020202020203620 69  C
20202020202020202020202020202020202020202020202020202020202020202020 70  C
20202020202020202020202020202020202020202020202020202020202020203720 70  C
20202020202020202020202020202020202020202020202020202020202020202020 71  C
20202020202020202020202020202020202020202020202020202020202020203720 71  C
20202020202020202020202020202020202020202020202020202020202020202020 72  C
20202020202020202020202020202020202020202020202020202020202020203720 72  C
20202020202020202020202020202020202020202020202020202020202020202020 73  C
20202020202020202020202020202020202020202020202020202020202020203720 73  C
20202020202020202020202020202020202020202020202020202020202020202020 74  C
20202020202020202020202020202020202020202020202020202020202020203720 74  C
20202020202020202020202020202020202020202020202020202020202020202020 75  C
20202020202020202020202020202020202020202020202020202020202020203720 75  C
20342020202020202320203C2020472820204920202020202820202020202020 76  C
20202020203468205F3E20203A2020202020202020202020202020202020753720 76  C
2020202020202020202020207A2020747A2020202020202020202020202020203A 77  C
3F20203D2023202020232020206A2029206E2020202020712020202039202020372O 77  C
20202020232020202023232322022032020 2E2020706F23206E2020262065612020 78  C
20202020202020202020202020202035412020206262206262202020202020372O 78  C
41202020616320322220202020202020202020202020202020202020682020203C20663A 79  C
20202022222720202060402027222720202226202020202020202020202020372O 79  C
20202020692020202020202020202020202020202020202020202020202020202020 80  C
20202020202020202020202020202020202020202020202020202020202020203820 80  C
20202020202020202020232020202059 4E2020202020202020202020207D2020202020 81  C
20202020202020202020202020202020202020202020202020202020202020203820 81  C
202D206C2020202020202020202020202020202020202020202020202020202020202020 82  C
20202020202020202020222020202020202020202020202020202020202020203820 82  C
                                                                        83  C
                                                                        84  C
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                                                                                85  C
        20202020202020206920202020202020202020202020203F20206220354120 86  C
        20206220206262202020202020F2020202020202020202020202020202020203820 86  C
        20202020202020206920202020202020202020202020202020202020207E354152 87  C
        52202020202020202020202020F2020202020202020202020202020202020203820 87  C
        20202020202020206920202020202020202020202020202020206320324120 88  C
        20206120202020202020402020F2020202020202020202020202020202020203820 88  C
        20202020202020207368202050C20205C2020202020202020512020207020314140 89  C
        20202020202061202020402020202020202020202020202020202020202020203820 89  C
        20202020202020202068202020202020202020202020202020205F20206320314120 90  C
        20206120222020202020402020F2020202020202020202020202020202020203920 90  C
        20202020202020207068202020202020206A2020202020202020206320314120 91  C
        20206127272022202020402020F2020202020202020202020202020202020203920 91  C
        20202020202020206F68202020202020206A2020202020202020206320324120 92  C
        20206127272020202020402020F2020202020202020202020202020202020203920 92  C
        20202020202020207068202020202020205C2020202020202020202020206320324120 93  C
        20206122 3D202020206040202F2020202020202020202020202020202020203920 93  C
        20202020202020207168202020202020202020202020202020202020206320324120 94  C
        20206122 3D202220206040202F2020202020202020202020202020202020203920 94  C
        20202020202020207068202020202020202020202020202020202020206220354120 95  C
        20206220206262272 03A20202F2020202020202020202020202020202020203920 95  C
        20202020202020207068202020202020202020202020202020202020206220354120 96  C
        20206220206262402060202020F2020202020202020202020202020202020203920 96  C
        20202020202020207168202020202020202020202020202020202020206220354120 97  C
        20206220206262272 03A20202F2020202020202020202020202020202020203920 97  C
        20202020202020206F68202020202020682020202020202020202020206220354120 98  C
        20206220206262232 06020202F2020202020202020202020202020202020203920 98  C
        20202020202020202068202050C20205C2068202020202020512020202020314543 99  C
        20202020226B60202020409B2020202020202020202020202020202020203920 99  C
        20202020202020202067202020202020202020202020202020202020206220354120 100 C
        20206249206262202020202020F2020202020202020202020202020202020203031 100 C
        *VBBLK* 12:36 JUN 03,'82                                                L
COMMENT IUE-VICAR HEADER END
HISTORY IUE-LOG STARTED                                 25-JUN-1993 07:34:51
HISTORY PROCESSING SYSTEM: NEWSIPS VERSION 2.2
HISTORY ULTRIX VERSION
HISTORY SWP17072
HISTORY PROCESSED AT GODDARD SPACE FLIGHT CENTER
HISTORY ************************************************************
HISTORY ************************************************************
HISTORY START RAW_SCREEN                                25-JUN-1993 07:34:06
HISTORY    3 BRIGHT SPOTS DETECTED
HISTORY    0 MISSING MINOR FRAMES DETECTED
HISTORY LARGE APERTURE SPECTRUM WILL BE EXTRACTED AS
HISTORY           POINT SOURCE
HISTORY LARGE APERTURE CONTINUUM DN LEVEL = 142
HISTORY SMALL APERTURE CONTINUUM DN LEVEL = 192
HISTORY BACKGROUND DN LEVEL =  24
HISTORY END   RAW_SCREEN                                25-JUN-1993 07:34:33
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```
HISTORY ****************************************************************
HISTORY START TTDC                                      25-JUN-1993 07:34:36
HISTORY TEMPERATURE USED FOR CORRECTING DISPERSION CONSTANTS =  6.49
HISTORY DATE OF OBSERVATION USED FOR CORRECTING
HISTORY          DISPERSION CONSTANTS = 30/ 5/82  20:44:23
HISTORY THIRD-ORDER FIT OVER TIME USED
HISTORY FIRST-ORDER FIT OVER TEMPERATURE USED
HISTORY ZERO-POINT CORRECTION =   0.19 ANGSTROMS
HISTORY SPATIAL CORRECTION =   0.25 PIXELS
HISTORY END   TTDC                                      25-JUN-1993 07:34:37
HISTORY ****************************************************************
HISTORY START CROSS-CORR                                25-JUN-1993 07:34:47
HISTORY WINDOW SIZE USED:    29 X  29 PIXELS
HISTORY TEMPLATE SIZE USED:  23 X  23 PIXELS
HISTORY ITF USED:  SWP85R92A
HISTORY  87.8  PERCENT SUCCESSFUL CORRELATIONS (122 OUT OF 139)
HISTORY MEDIAN CORRELATION COEFFICIENT: 0.404
HISTORY STANDARD DEVIATION OF CORRELATION COEFFICIENT: 0.139
HISTORY MEAN SHIFT IN PIXELS: 0.510
HISTORY MAXIMUM SHIFT IN PIXELS: 1.380
HISTORY NUMBER OF SUCCESSFUL SHIFTS FILTERED AS UNRELIABLE IN
HISTORY     POST-FILTER ROUTINE:   0
HISTORY END   CROSS-CORR                                25-JUN-1993 07:36:30
HISTORY ****************************************************************
HISTORY START PHOTOM                                    25-JUN-1993 07:37:38
HISTORY ITF USED: SWP85R92A
HISTORY MEAN TEMPERATURE OF ITF:  9.3 C
HISTORY ITF UVC=-5.0 KV; UVFLOOD WAVELENGTH = 2536 A; ITF SEC =-6.1 KV
HISTORY ITF CONSTRUCTION: RAW SPACE, FOURIER FILTERED; JAN92
HISTORY END   PHOTOM                                    25-JUN-1993 07:39:37
HISTORY ****************************************************************
HISTORY START GEOM                                      25-JUN-1993 07:40:54
HISTORY WAVELENGTH LINEARIZATION APPLIED USING CHEBYSHEV COEFFICIENTS:
HISTORY      C(0) = 319.620
HISTORY      C(1) = 318.820
HISTORY      C(2) = 0.87967
HISTORY      C(3) = 0.67988
HISTORY WAVELENGTH ZEROPOINT AND SPATIAL SHIFT APPLIED:
HISTORY      ZERO-POINT SHIFT = -17.37 ANGSTROMS
HISTORY      SPATIAL SHIFT =   2.68 PIXELS
HISTORY FINAL TIME/TEMP CORRECTED DISPERSION CONSTANTS USED:
HISTORY      1050.00 ANGSTROMS, 1.6763 ANGSTROMS/PIXEL
HISTORY PREDICTED CENTER LINE OF LARGE APERTURE = LINE 51.0
HISTORY PREDICTED CENTER LINE OF SMALL APERTURE = LINE 24.9
HISTORY END   GEOM                                      25-JUN-1993 07:46:57
HISTORY ****************************************************************
HISTORY START SWET                                      25-JUN-1993 07:47:32
HISTORY  NOISE MODEL USED: SWP  VERSION 1.0
HISTORY
HISTORY  **********************LARGE APERTURE DATA**********************
HISTORY
HISTORY  PREDICTED SPECTRUM CENTER AT LINE 51, CENTROID FOUND AT
HISTORY       LINE 51, PEAK AT LINE 52, AVERAGE PEAK FN =   122.3
```

```
HISTORY  CROSS-DISPERSION PROFILES BINNED WITH A BLOCKSIZE OF   1 PIXELS,
HISTORY       FOR A TOTAL OF 526 BLOCKS, OF WHICH  65 ARE REJECTED
HISTORY  FIT PROFILE WITH 15 NODES AND  3.50 SIGMA REJECTION
HISTORY  PROFILE CENTROID AT LINE  50.7
HISTORY  EXTRACT FLUX FROM LINES 45 THROUGH  57
HISTORY  REJECT PIXELS DEVIATING BY  4.0 SIGMA
HISTORY  OUT OF    8320 PIXELS      18 REJECTED AS COSMIC RAY HITS,
HISTORY          139 FLAGGED AS BAD
HISTORY  ABSOLUTE FLUX CALIBRATION SWP VERSION 1.0 APPLIED USING:
HISTORY       MODE = LARGE APERTURE POINT SOURCE
HISTORY       CALIBRATION EPOCH = 1985.00
HISTORY       CAMERA RISE TIME = 0.130 SECONDS
HISTORY       EFFECTIVE EXPOSURE TIME =     9.700 SECONDS
HISTORY  TEMPERATURE-DEPENDENT SENSITIVITY CORRECTION APPLIED USING:
HISTORY       THDA OF IMAGE =  6.49
HISTORY       REFERENCE THDA =  9.40
HISTORY       TEMPERATURE COEFFICIENT = -0.0046
HISTORY       TEMPERATURE CORRECTION FACTOR =   0.987
HISTORY  SENSITIVITY DEGRADATION CORRECTION SWP VERSION 1.0 APPLIED USING:
HISTORY       MODE = LARGE APERTURE POINT SOURCE
HISTORY       CALIBRATION EPOCH = 1985.00
HISTORY       OBSERVATION DATE = 1982.411
HISTORY
HISTORY  **********SMALL APERTURE DATA**********
HISTORY
HISTORY  PREDICTED SPECTRUM CENTER AT LINE 25, CENTROID FOUND AT
HISTORY       LINE 25, PEAK AT LINE 25, AVERAGE PEAK FN =   205.6
HISTORY  CROSS-DISPERSION PROFILES BINNED WITH A BLOCKSIZE OF   1 PIXELS,
HISTORY       FOR A TOTAL OF 526 BLOCKS, OF WHICH  76 ARE REJECTED
HISTORY  FIT PROFILE WITH 15 NODES AND  3.50 SIGMA REJECTION
HISTORY  PROFILE CENTROID AT LINE  24.7
HISTORY  EXTRACT FLUX FROM LINES 19 THROUGH  31
HISTORY  REJECT PIXELS DEVIATING BY  4.0 SIGMA
HISTORY  OUT OF    8320 PIXELS      47 REJECTED AS COSMIC RAY HITS,
HISTORY          165 FLAGGED AS BAD
HISTORY  ABSOLUTE FLUX CALIBRATION SWP VERSION 1.0 APPLIED USING:
HISTORY       MODE = SMALL APERTURE POINT SOURCE
HISTORY       CALIBRATION EPOCH = 1985.00
HISTORY       CAMERA RISE TIME = 0.130 SECONDS
HISTORY       EFFECTIVE EXPOSURE TIME =    29.771 SECONDS
HISTORY  TEMPERATURE-DEPENDENT SENSITIVITY CORRECTION APPLIED USING:
HISTORY       THDA OF IMAGE =  6.49
HISTORY       REFERENCE THDA =  9.40
HISTORY       TEMPERATURE COEFFICIENT = -0.0046
HISTORY       TEMPERATURE CORRECTION FACTOR =   0.987
HISTORY  SENSITIVITY DEGRADATION CORRECTION SWP VERSION 1.0 APPLIED USING:
HISTORY       MODE = LARGE APERTURE POINT SOURCE
HISTORY              APPLIED TO SMALL APERTURE DATA
HISTORY       CALIBRATION EPOCH = 1985.00
HISTORY       OBSERVATION DATE = 1982.411
HISTORY END   SWET                                    25-JUN-1993 07:48:30
HISTORY ******************************************************************
HISTORY START FITSCOPY                                25-JUN-1993 07:48:36
END
```

EXTENSION HEADER

```
XTENSION= 'IMAGE   '           / Image extension
BITPIX  =                   16 / 16-bit 2's complement pixels
NAXIS   =                    2 / Two_dimensional image
NAXIS1  =                  640 / Dimension along the x-axis
NAXIS2  =                   80 / Dimension along the y-axis
PCOUNT  =                    0 / Number of bytes following data matrix
GCOUNT  =                    1 / Number of groups
CRPIX1  =                   1. / x reference pixel
CRPIX2  =                   1. / y reference pixel
CRVAL1  =               1050.00 / Coordinate of CRPIX1
CRVAL2  =                   1. / Coordinate of CRPIX2
CDELT1  =               1.67634 / Increment unit along the x-axis
CDELT2  =                   1. / Increment unit along the y-axis
CTYPE1  = 'WAVELENGTH'         / x-axis units
CTYPE2  = 'SCAN    '           / y-axis units
BUNIT   = '        '           / Unitless
FILENAME= 'SWP17072.SFLO'      / Filename (camera)(number).SF(disp)
EXTNAME = 'SILOF   '           / SILO pixel quality flags
END
```

FITS HEADER FOR SWP17072.MXLO

```
SIMPLE  =                    T / Standard FITS Format
BITPIX  =                    8 / 8 bits ASCII
NAXIS   =                    0 / No image data
EXTEND  =                    T / Extensions are present
TELESCOP= 'IUE     '           / International Ultraviolet Explorer
DATE    = '25/06/93'           / Date file was written
ORIGIN  = 'GSFC    '           / Institution generating the file
COMMENT *
COMMENT * CORE DATA ITEMS - COMMON SET
COMMENT *
CAMERA  = 'SWP     '           / Camera
IMAGE   =                17072 / Sequential image number
DISPERSN= 'LOW     '           / Spectrograph dispersion mode
APERTURE= 'BOTH    '           / Aperture
DISPTYPE= 'LOW     '           / Dispersion processing type
READMODE= 'FULL    '           / Read mode
READGAIN= 'LOW     '           / Read gain
EXPOGAIN= 'MAXIMUM '           / Exposure gain
UVC-VOLT=                 -5.0 / UVC voltage
ABNNOSTD= 'NO      '           / Non-standard image acquisition
ABNBADSC= 'NO      '           / LWP bad scans
ABNHTRWU= 'NO      '           / LWR heater warmup
ABNREAD = 'NO      '           / Read at other than 20 KB
ABNUVC  = 'NO      '           / Non-standard UVC voltage
ABNHISTR= 'NO      '           / History replay
ABNOTHER= 'NO      '           / Other abnormality
THDAREAD=                 6.49 / THDA at read of image
EQUINOX =              1950.00 / Epoch of coordinates
STATION = 'GSFC    '           / Observing station
ORBEPOCH= '26/05/82'           / Orbital elements epoch
ORBSAXIS=              42169.1 / Semi-major axis in kilometers
ORBECCEN=            0.2242648 / Eccentricity
ORBINCLI=               28.457 / Inclination in degrees
ORBASCEN=              174.369 / Ascending node in degrees
ORBPERIG=              290.114 / Argument of perigee in degrees
ORBANOMA=               77.834 / Mean anomaly in degrees
POSANGLE=                30.54 / Pos angle of the large aperture (deg)
LAMP    = 'NONE    '           / Lamp
PGM-ID  = 'PHCAL   '           / Program identification
ABNMINFR= 'NO      '           / Bad/missing minor frames
CC-PERCN=                 87.7 / Cross-correlation % successful
CC-WINDW=                   29 / Cross-correlation window size
CC-TEMPL=                   23 / Cross-correlation template size
CC-MEDN =                0.404 / Median cross-correlation coefficient
CC-STDEV=                0.139 / St dev of cross-corr coefficients
SHFTMEAN=                0.510 / Mean shift between image and ITF
SHFTMAX =                1.380 / Maximum shift between image and ITF
ITF     = 'SWP85R92A'          / ITF identification
TILTCORR= 'NO      '           / Tilt correction flag
```

```
MEANRAT =                1.004 / SI vs LI mean
STDEVRAT=                0.988 / SI vs LI standard deviation
COMMENT BY RA:  EXP 1 APER L C=160,B=21
COMMENT BY RA:  EXP 2 APER S C=220,B=21
COMMENT BY RA:     0 MISSING MINOR FRAMES NOTED ON SCRIPT
COMMENT BY RA:  EXP 1 TRACKED ON GYROS
COMMENT BY RA:  EXP 2 TRACKED ON GYROS
COMMENT BY RA:  S   PREP USED
COMMENT *
COMMENT * CORE DATA ITEMS - LARGE APERTURE SET
COMMENT *
LDATEOBS= '30/05/82'           / Observing date
LTIMEOBS= '20:44:23'           / Observing time
LMJD-OBS=          45119.86416 / Mod. JD start of obs. (JD - 2400000.5)
LEXPTRMD= 'NO-TRAIL'           / Trail mode
LEXPMULT= 'NO      '           / Multiple exposure mode
LEXPSEGM= 'NO      '           / Segmented exposure code
LEXPTIME=                9.700 / Integration time in seconds
LTHDASTR=                 6.50 / THDA at start of exposure
LTHDAEND=                 6.49 / THDA at end of exposure
LRA     =             113.0339 / Homogeneous R.A. in degrees
LDEC    =             -50.4747 / Homogeneous Dec. in degrees
LLAPSTAT= 'OPEN    '           / Large aperture status
LFES2MD = 'FO      '           / FES(2) mode
LFES2CN =                 7621 / FES(2) counts on target
LTARGET = 'HD 60753'           / Object as given by Guest Observer
LTARGRA =             113.0338 / R.A. in degrees (given by GO)
LTARGDEC=             -50.4747 / Dec. in degrees (given by GO)
LOBJECT = 'HD  60753'                    / Homogeneous Object ID
LIUECLAS=                  21 / Object class
LFOCUS  =               -1.07 / Focus
LFPM    =                2.88 / Flux particle monitor
LGSTAR2M= 'NO      '           / Guide star mode FES2
LMJD-MID=          45119.86421 / Mod. JD middle of obs. (JD - 2400000.5)
LHELCORR=              -.00074 / Heliocentric corr to midpoint (days)
LDATABKG=                  24 / Estimated mean background level (DNs)
LDATACNT=                 142 / Estimated maximum continuum level (DNs)
LCNTRAPR=                51.0 / Predicted center line of spectrum
LXTRMODE= 'POINT   '           / Extraction mode
LXTRPROF= 'EMPIRICAL'          / Profile used
LXTRASYM= 'NO      '           / Asymmetrical profile in extraction
LXTRCNTR=                50.7 / Center line of extracted spectrum
LFLUXAVE=                122.3 / Average flux (FNs)
COMMENT *
COMMENT * CORE DATA ITEMS - SMALL APERTURE SET
COMMENT *
SDATEOBS= '30/05/82'           / Observing date
STIMEOBS= '20:48:59'           / Observing time
SMJD-OBS=          45119.86735 / Mod. JD start of obs. (JD - 2400000.5)
SEXPTRMD= 'NO-TRAIL'           / Trail mode
SEXPMULT= 'NO      '           / Multiple exposure mode
SEXPSEGM= 'NO      '           / Segmented exposure code
SEXPTIME=               29.771 / Integration time in seconds
STHDASTR=                 6.50 / THDA at start of exposure
STHDAEND=                 6.49 / THDA at end of exposure
```

```
SRA     =             113.0339 / Homogeneous R.A. in degrees
SDEC    =             -50.4747 / Homogeneous Dec. in degrees
SLAPSTAT= 'OPEN    '           / Large aperture status
SFES2MD = 'FO      '           / FES(2) mode
SFES2CN =                7717 / FES(2) counts on target
STARGET = 'HD 60753'           / Object as given by Guest Observer
STARGRA =             113.0338 / R.A. in degrees (given by GO)
STARGDEC=             -50.4747 / Dec. in degrees (given by GO)
SOBJECT = 'HD  60753'                  / Homogeneous Object ID
SIUECLAS=                  21 / Object class
SFOCUS  =               -1.07 / Focus
SFPM    =                2.78 / Flux particle monitor
SGSTAR2M= 'NO      '           / Guide star mode FES2
SMJD-MID=          45119.86752 / Mod. JD middle of obs. (JD - 2400000.5)
SHELCORR=              -.00074 / Heliocentric corr to midpoint (days)
SDATABKG=                  24 / Estimated mean background level (DNs)
SDATACNT=                 192 / Estimated maximum continuum level (DNs)
SCNTRAPR=                24.9 / Predicted center line of spectrum
SXTRMODE= 'POINT   '           / Extraction mode
SXTRPROF= 'EMPIRICAL'          / Profile used
SXTRASYM= 'NO      '           / Asymmetrical profile in extraction
SXTRCNTR=                24.7 / Center line of extracted spectrum
SFLUXAVE=               205.6 / Average flux (FNs)
COMMENT *
COMMENT * THE IUE VICAR HEADER
COMMENT *
COMMENT IUE-VICAR HEADER START
                                1   1 768 768   1 2 013117072          1  C
  3838*   2*IUESOC  *   *   *    40*      *   *  * * * * * *     *  2  C
SWP 17072, HD 60753, 10 SEC LGAP/30 SEC SMAP EXPOS, LO DISP          3  C
                                                                      4  C
                                                                      5  C
OBSERVER: CATHY IMHOFF   PROGRAM: PHCAL   1982/150/30 MAY            6  C
                                                                      7  C
                                                                      8  C
                                                                      9  C
82150205918* 9   * 218 *OPSPRC29*195026 X 56 Y 72 G1 99 HT 106   * 10  C
205921 READ 3 IMAGE 17072       *201311 TLM,SWPROM                * 11  C
210001 SCAN READLO SS 1 G3 44   *201538 SPREP 3                   * 12  C
210014 X 60 Y 76 G1 82 HT 105   *202835 TLM,FES2ROM               * 13  C
205953                          *202918 MODE LWL                  * 14  C
210013                          *203601 FESIMAGE 0 0 81           * 15  C
185819 EXPOBC 2 9 0    MAXG NOL *204337 TARGET IN SWLA            * 16  C
190431 TLM,LWRROM               *204428 EXPOBC 3 0 10   MAXG NOL  * 17  C
190726 FIN 2 T 539 S 98 U 109   *204503 FIN 3 T 9 S 97 U 109      * 18  C
190805 TARGET FROM LWLA         *204546 TARGET FROM SWLA          * 19  C
190821 READPREP 2 IMAGE 13354   *204805 TARGET IN SWSA            * 20  C
191248 SCAN READLO SS 1 G3 58   *204902 EXPOBC 3 0 30   MAXG NOL  * 21  C
191305 X 56 Y 72 G1 99 HT 106   *204942 FIN 3 T 39 S 97 U 109     * 22  C
193247 TLM,FES2ROM              *205020 TARGET FROM SWSA          * 23  C
193512 TARGET IN LWLA           *205212 TARGET IN LWLA            * 24  C
193633 FESTRK TRACKING          *205304 EXPOBC 2 0 7    MAXG NOL  * 25  C
193732 EXPOBC 2 6 40   MAXG NOL *205344 FIN 2 T 6 S 98 U 109      * 26  C
194134 TLM,LWRROM               *205425 TARGET FROM LWLA          * 27  C
```

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194414 FIN 2 T 399 S 98 U 109   *205603 TARGET IN LWSA           * 28  C
194451 TARGET FROM LWLA         *205702 EXPOBC 2 0 21   MAXG NOL * 29  C
194522 S/C READY FOR MANEUVER   *205745 FIN 2 T 27 S 98 U 109    * 30  C
194540 READPREP 2 IMAGE 13355   *205831 TARGET FROM LWSA         * 31  C
195006 SCAN READLO SS 1 G3 58   *205853 TLM,SWPROM               * 32  C
                                                                  33  C
                                                                  34  C
                                                                  35  C
PHCAL*1*02*CATHY IMHOFF    * 14*    *H*00060753*0*0*1* 21         36  C
 732 81-502829*999*B3*4* 6.7* 0.11*          *    * 999.99*   *    37  C
                                                                  38  C
                                                                  39  C
                                                                  40  C
                                                                  41  C
                                                                  42  C
                                                                  43  C
                                                                  44  C
                                                                  45  C
20202020202020202020202020202020202020202020202020202020202020202020 46  C
20202020202020202020202020202020202020202020202020202020202020203420 46  C
                                                                  47  C
                                                                  48  C
                                                                  49  C
                                                                  50  C
20202020202020202020202020202020202020202020202020202020202020202020 51  C
20202020202020202020202020202020202020202020202020202020202020203520 51  C
20202020202020202020202020202020202020202020202020202020202020202020 52  C
20202020202020202020202020202020202020202020202020202020202020203520 52  C
20202020202020202020202020202020202020202020202020202020202020202020 53  C
20202020202020202020202020202020202020202020202020202020202020203520 53  C
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20202020202020202020202020202020202020202020202020202020202020203520 54  C
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20202020202020202020202020202020202020202020202020202020202020203520 55  C
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20202020202020202020202020202020202020202020202020202020202020203520 57  C
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20202020202020202020202020202020202020202020202020202020202020203520 59  C
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20202020202020202020202020202020202020202020202020202020202020203620 62  C
20202020202020202020202020202020202020202020202020202020202020202020 63  C
20202020202020202020202020202020202020202020202020202020202020203620 63  C
20202020202020202020202020202020202020202020202020202020202020202020 64  C
20202020202020202020202020202020202020202020202020202020202020203620 64  C
20202020202020202020202020202020202020202020202020202020202020202020 65  C
20202020202020202020202020202020202020202020202020202020202020203620 65  C
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20202020202020202020202020202020202020202020202020202020202020202020 66 C
20202020202020202020202020202020202020202020202020202020202020203620 66 C
20202020202020202020202020202020202020202020202020202020202020202020 67 C
20202020202020202020202020202020202020202020202020202020202020203620 67 C
20202020202020202020202020202020202020202020202020202020202020202020 68 C
20202020202020202020202020202020202020202020202020202020202020203620 68 C
20202020202020202020202020202020202020202020202020202020202020202020 69 C
20202020202020202020202020202020202020202020202020202020202020203620 69 C
20202020202020202020202020202020202020202020202020202020202020202020 70 C
20202020202020202020202020202020202020202020202020202020202020203720 70 C
20202020202020202020202020202020202020202020202020202020202020202020 71 C
20202020202020202020202020202020202020202020202020202020202020203720 71 C
20202020202020202020202020202020202020202020202020202020202020202020 72 C
20202020202020202020202020202020202020202020202020202020202020203720 72 C
20202020202020202020202020202020202020202020202020202020202020202020 73 C
20202020202020202020202020202020202020202020202020202020202020203720 73 C
20202020202020202020202020202020202020202020202020202020202020202020 74 C
20202020202020202020202020202020202020202020202020202020202020203720 74 C
20202020202020202020202020202020202020202020202020202020202020202020 75 C
20202020202020202020202020202020202020202020202020202020202020203720 75 C
20342020202020202320203C2020472820204920202020202820202020202020 76 C
20202020203468205F3E20203A2020202020202020202020202020202020753720 76 C
20202020202020202020207A2020747A2020202020202020202020202020203A 77 C
3F20203D2023202020232020206A2029206E2020202020712020202039202020 3720 77 C
20202020232020202023232322202320202E2020706F23206E2020262065612020 78 C
20202020202020202020202020203541202020626220626220202020202037 20 78 C
41202020616320322220202020202020202020202020202020682020203C20663A 79 C
20202022222720202060402027222720202226202020202020202020202037 20 79 C
20202020692020202020202020202020202020202020202020202020202020202020 80 C
20202020202020202020202020202020202020202020202020202020202020203820 80 C
20202020202020202023202020205 94E2020202020202020202020207D2020202020 81 C
20202020202020202020202020202020202020202020202020202020202020203820 81 C
202D206C2020202020202020202020202020202020202020202020202020202020202020 82 C
20202020202020202020222020202020202020202020202020202020202020203820 82 C
                                                                        83 C
                                                                        84 C
                                                                        85 C
20202020202020202069202020202020202020202020202020203F20206220354120 86 C
20206220206262202020202020F2020202020202020202020202020202020203820 86 C
20202020202020202069202020202020202020202020202020202020207E354152 87 C
52202020202020202020202020F2020202020202020202020202020202020203820 87 C
20202020202020202069202020202020202020202020202020202020206320324120 88 C
20206120202020202020402020F2020202020202020202020202020202020203820 88 C
20202020202020207368202050C20205C2020202020202020512020207020314140 89 C
20202020202061202020402020202020202020202020202020202020202020203820 89 C
20202020202020202068202020202020202020202020202020205F20206320314120 90 C
20206120222020202020402020F2020202020202020202020202020202020203920 90 C
20202020202020207068202020202020206A2020202020202020202063203141 20 91 C
20206127272022020202040202F2020202020202020202020202020202020203920 91 C
20202020202020206F68202020202020206A2020202020202020202063203241 20 92 C
20206127272020202020402020F2020202020202020202020202020202020203920 92 C
20202020202020207068202020202020205C2020202020202020202020206320324120 93 C
20206122 3D20202020604020 2F2020202020202020202020202020202020203920 93 C
20202020202020207168202020202020202020202020202020202020202020206320324120 94 C
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        202061223D202220206040202F2020202020202020202020202020202020203920 94  C
        2020202020202020706820202020202020202020202020202020202020206220354120 95  C
        202062202062622720 3A20202F2020202020202020202020202020202020203920 95  C
        2020202020202020706820202020202020202020202020202020202020206220354120 96  C
        202062202062624020602020 2F2020202020202020202020202020202020203920 96  C
        2020202020202020716820202020202020202020202020202020202020206220354120 97  C
        202062202062622720 3A20202F2020202020202020202020202020202020203920 97  C
        2020202020202020 6F68202020202020206820202020202020202020206220354120 98  C
        202062202062622320602020 2F2020202020202020202020202020202020203920 98  C
        2020202020202020206820205C20205C2068202020202020512020202020314543 99  C
        202020202 26B60202020409B2020202020202020202020202020202020203920 99  C
        2020202020202020206720202020202020202020202020202020202020206220354120 100 C
        202062492062622020202020 2F2020202020202020202020202020202020203031 100 C
        *VBBLK* 12:36 JUN 03,'82                                                L
COMMENT IUE-VICAR HEADER END
HISTORY IUE-LOG STARTED                                25-JUN-1993 07:34:51
HISTORY PROCESSING SYSTEM: NEWSIPS VERSION 2.2
HISTORY ULTRIX VERSION
HISTORY SWP17072
HISTORY PROCESSED AT GODDARD SPACE FLIGHT CENTER
HISTORY ************************************************************
HISTORY ************************************************************
HISTORY START RAW_SCREEN                               25-JUN-1993 07:34:06
HISTORY    3 BRIGHT SPOTS DETECTED
HISTORY    0 MISSING MINOR FRAMES DETECTED
HISTORY LARGE APERTURE SPECTRUM WILL BE EXTRACTED AS
HISTORY           POINT SOURCE
HISTORY LARGE APERTURE CONTINUUM DN LEVEL = 142
HISTORY SMALL APERTURE CONTINUUM DN LEVEL = 192
HISTORY BACKGROUND DN LEVEL =  24
HISTORY END   RAW_SCREEN                               25-JUN-1993 07:34:33
HISTORY ************************************************************
HISTORY START TTDC                                     25-JUN-1993 07:34:36
HISTORY TEMPERATURE USED FOR CORRECTING DISPERSION CONSTANTS =  6.49
HISTORY DATE OF OBSERVATION USED FOR CORRECTING
HISTORY           DISPERSION CONSTANTS = 30/ 5/82  20:44:23
HISTORY THIRD-ORDER FIT OVER TIME USED
HISTORY FIRST-ORDER FIT OVER TEMPERATURE USED
HISTORY ZERO-POINT CORRECTION =   0.19 ANGSTROMS
HISTORY SPATIAL CORRECTION =   0.25 PIXELS
HISTORY END   TTDC                                     25-JUN-1993 07:34:37
HISTORY ************************************************************
HISTORY START CROSS-CORR                               25-JUN-1993 07:34:47
HISTORY WINDOW SIZE USED:    29 X  29 PIXELS
HISTORY TEMPLATE SIZE USED:  23 X  23 PIXELS
HISTORY ITF USED:  SWP85R92A
HISTORY  87.8  PERCENT SUCCESSFUL CORRELATIONS (122 OUT OF 139)
HISTORY MEDIAN CORRELATION COEFFICIENT: 0.404
HISTORY STANDARD DEVIATION OF CORRELATION COEFFICIENT: 0.139
HISTORY MEAN SHIFT IN PIXELS: 0.510
HISTORY MAXIMUM SHIFT IN PIXELS: 1.380
HISTORY NUMBER OF SUCCESSFUL SHIFTS FILTERED AS UNRELIABLE IN
HISTORY     POST-FILTER ROUTINE:   0
HISTORY END   CROSS-CORR                               25-JUN-1993 07:36:30
```

```
HISTORY ****************************************************************
HISTORY START PHOTOM                                    25-JUN-1993 07:37:38
HISTORY ITF USED: SWP85R92A
HISTORY MEAN TEMPERATURE OF ITF:  9.3 C
HISTORY ITF UVC=-5.0 KV; UVFLOOD WAVELENGTH = 2536 A; ITF SEC =-6.1 KV
HISTORY ITF CONSTRUCTION: RAW SPACE, FOURIER FILTERED; JAN92
HISTORY END   PHOTOM                                    25-JUN-1993 07:39:37
HISTORY ****************************************************************
HISTORY START GEOM                                      25-JUN-1993 07:40:54
HISTORY WAVELENGTH LINEARIZATION APPLIED USING CHEBYSHEV COEFFICIENTS:
HISTORY      C(0) = 319.620
HISTORY      C(1) = 318.820
HISTORY      C(2) = 0.87967
HISTORY      C(3) = 0.67988
HISTORY WAVELENGTH ZEROPOINT AND SPATIAL SHIFT APPLIED:
HISTORY      ZERO-POINT SHIFT = -17.37 ANGSTROMS
HISTORY      SPATIAL SHIFT =   2.68 PIXELS
HISTORY FINAL TIME/TEMP CORRECTED DISPERSION CONSTANTS USED:
HISTORY      1050.00 ANGSTROMS, 1.6763 ANGSTROMS/PIXEL
HISTORY PREDICTED CENTER LINE OF LARGE APERTURE = LINE 51.0
HISTORY PREDICTED CENTER LINE OF SMALL APERTURE = LINE 24.9
HISTORY END   GEOM                                      25-JUN-1993 07:46:57
HISTORY ****************************************************************
HISTORY START SWET                                      25-JUN-1993 07:47:32
HISTORY  NOISE MODEL USED: SWP  VERSION 1.0
HISTORY
HISTORY  **********************LARGE APERTURE DATA**********************
HISTORY
HISTORY  PREDICTED SPECTRUM CENTER AT LINE 51, CENTROID FOUND AT
HISTORY       LINE 51, PEAK AT LINE 52, AVERAGE PEAK FN =   122.3
HISTORY  CROSS-DISPERSION PROFILES BINNED WITH A BLOCKSIZE OF   1 PIXELS,
HISTORY       FOR A TOTAL OF 526 BLOCKS, OF WHICH  65 ARE REJECTED
HISTORY  FIT PROFILE WITH 15 NODES AND  3.50 SIGMA REJECTION
HISTORY  PROFILE CENTROID AT LINE  50.7
HISTORY  EXTRACT FLUX FROM LINES 45 THROUGH  57
HISTORY  REJECT PIXELS DEVIATING BY  4.0 SIGMA
HISTORY  OUT OF    8320 PIXELS      18 REJECTED AS COSMIC RAY HITS,
HISTORY          139 FLAGGED AS BAD
HISTORY  ABSOLUTE FLUX CALIBRATION SWP VERSION 1.0 APPLIED USING:
HISTORY       MODE = LARGE APERTURE POINT SOURCE
HISTORY       CALIBRATION EPOCH = 1985.00
HISTORY       CAMERA RISE TIME = 0.130 SECONDS
HISTORY       EFFECTIVE EXPOSURE TIME =     9.700 SECONDS
HISTORY  TEMPERATURE-DEPENDENT SENSITIVITY CORRECTION APPLIED USING:
HISTORY       THDA OF IMAGE =  6.49
HISTORY       REFERENCE THDA =  9.40
HISTORY       TEMPERATURE COEFFICIENT = -0.0046
HISTORY       TEMPERATURE CORRECTION FACTOR =   0.987
HISTORY  SENSITIVITY DEGRADATION CORRECTION SWP VERSION 1.0 APPLIED USING:
HISTORY       MODE = LARGE APERTURE POINT SOURCE
HISTORY       CALIBRATION EPOCH = 1985.00
HISTORY       OBSERVATION DATE = 1982.411
HISTORY
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HISTORY  **********SMALL APERTURE DATA**********
HISTORY
HISTORY  PREDICTED SPECTRUM CENTER AT LINE 25, CENTROID FOUND AT
HISTORY       LINE 25, PEAK AT LINE 25, AVERAGE PEAK FN =   205.6
HISTORY  CROSS-DISPERSION PROFILES BINNED WITH A BLOCKSIZE OF   1 PIXELS,
HISTORY       FOR A TOTAL OF 526 BLOCKS, OF WHICH  76 ARE REJECTED
HISTORY  FIT PROFILE WITH 15 NODES AND  3.50 SIGMA REJECTION
HISTORY  PROFILE CENTROID AT LINE  24.7
HISTORY  EXTRACT FLUX FROM LINES 19 THROUGH  31
HISTORY  REJECT PIXELS DEVIATING BY  4.0 SIGMA
HISTORY  OUT OF    8320 PIXELS      47 REJECTED AS COSMIC RAY HITS,
HISTORY          165 FLAGGED AS BAD
HISTORY  ABSOLUTE FLUX CALIBRATION SWP VERSION 1.0 APPLIED USING:
HISTORY       MODE = SMALL APERTURE POINT SOURCE
HISTORY       CALIBRATION EPOCH = 1985.00
HISTORY       CAMERA RISE TIME = 0.130 SECONDS
HISTORY       EFFECTIVE EXPOSURE TIME =    29.771 SECONDS
HISTORY  TEMPERATURE-DEPENDENT SENSITIVITY CORRECTION APPLIED USING:
HISTORY       THDA OF IMAGE =  6.49
HISTORY       REFERENCE THDA =  9.40
HISTORY       TEMPERATURE COEFFICIENT = -0.0046
HISTORY       TEMPERATURE CORRECTION FACTOR =   0.987
HISTORY  SENSITIVITY DEGRADATION CORRECTION SWP VERSION 1.0 APPLIED USING:
HISTORY       MODE = LARGE APERTURE POINT SOURCE
HISTORY              APPLIED TO SMALL APERTURE DATA
HISTORY       CALIBRATION EPOCH = 1985.00
HISTORY       OBSERVATION DATE = 1982.411
HISTORY END   SWET                                    25-JUN-1993 07:48:30
HISTORY ************************************************************
HISTORY START FITSCOPY                                25-JUN-1993 07:48:36
END
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EXTENSION HEADER

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XTENSION= 'BINTABLE'           / Table Extension
BITPIX  =                    8 / Binary data
NAXIS   =                    2 / Two_dimensional table array
NAXIS1  =                11535 / Bytes per row (15+18*NPOINTS)
NAXIS2  =                    2 / Number of apertures (1-single, 2-both)
PCOUNT  =                    0 / Number of bytes following data matrix
GCOUNT  =                    1 / Only one group
TFIELDS =                    9 / Number of columns in the table
TFORM1  = '5A      '           / Count and data type of field 1
TTYPE1  = 'APERTURE'           / Aperture type (large or small)
TUNIT1  = '        '           / Unitless
TFORM2  = '1I      '           / Field 2 has one 2-byte integer
TTYPE2  = 'NPOINTS '           / Number of points
TUNIT2  = '        '           / Unitless
TFORM3  = '1E      '           / Count and data type of field 3
TTYPE3  = 'WAVELENGTH'         / 3rd field is starting wavelength
TUNIT3  = 'ANGSTROM'           / Unit is angstrom
TFORM4  = '1E      '           / Count and data type of field 4
TTYPE4  = 'DELTAW  '           / 4th field is wavelength increment
TUNIT4  = 'ANGSTROM'           / Unit is angstrom
TFORM5  = '640E    '           / Count and data type of field 5
TTYPE5  = 'NET     '           / 5th field is net flux array
TUNIT5  = 'FN      '           / Unit is IUE FN
TFORM6  = '640E    '           / Count and data type of field 6
TTYPE6  = 'BACKGROUND'         / 6th field is background flux array
TUNIT6  = 'FN      '           / Units IUE FN
TFORM7  = '640E    '           / Count and data type of field 7
TTYPE7  = 'SIGMA   '           / 7th field is the sigma
TUNIT7  = 'ERG/CM2/S/A'        / Unit is erg/cm2/sec/angstrom
TFORM8  = '640I    '           / Count and data type of field 8
TTYPE8  = 'QUALITY '           / 8th field is the data quality flag
TUNIT8  = '        '           / Unitless
TFORM9  = '640E    '           / Count and data type of field 9
TTYPE9  = 'FLUX    '           / 9th field is the calibrated flux
TUNIT9  = 'ERG/CM2/S/A'        / Unit is erg/cm2/sec/angstrom
FILENAME= 'SWP17072.MXLO'      / Filename (camera)(number).MXLO
EXTNAME = 'MELO    '           / Name of table
END
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