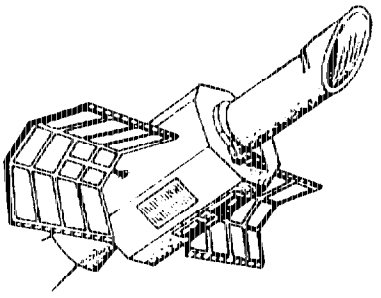
IUE NEWS



November 1, 1983 Special Edition Greenbelt, Maryland

LWP BECOMES DEFAULT CAMERA

Due to an anomaly on the LWR camera, the Three Agencies overseeing the IUE satellite decided to make the LWP the primary long wavelength camera as of October 16, 1983.

Flare on the LWR Camera On September 5, the Resident Astronomers on shift noticed a bright spot near the bottom of an LWR image. Subsequent investigation showed that the spot had been present faintly in all long LWR exposures since April 11. Test exposures were obtained by staff at Vilspa and Goddard to isolate the portion of the camera that was giving rise to the problem. Camera engineers from the Science and Engineering Research Council concluded that the spot was due to a flare, or discharge, in the ultraviolet converter (UVC).

Three Agency Concerns At the Three Agency (NASA, SERC, and ESA) meeting held in early October, the decision was made to switch to the LWP camera as the default long-wavelength camera. Two concerns played a part in this decision. First, the flare has been increasing in brightness (currently about 30 DN/hour), affecting the lower orders of many LWR high dispersion images. Second, the flare could affect the quantum efficiency of the camera.

Future Use of the LWR Camera Guest Observers may request the use of the LWR camera if their observing programs would otherwise be severely impacted. However, use of the LWR is to be kept to less than 25% of last year's level, or about 480 hours of total exposure time in the next year. At this time, it is not known whether the characteristics of the camera have changed due to the flare.

New ITF for the LWR Because of the flare, plans for a new ITF for the LWR camera have been accelerated. A block of four 24-hour days required for the observations has been scheduled for November 24 - 27. These dates were chosen by the Goddard and Vilspa schedulers to minimize the impact to Guest Observer programs; the affected programs will be rescheduled. A new ITF for the LWR had previously been under discussion in order to improve the calibration of the camera. The LWR ITF currently in use suffers from significant nonlinearities. In addition, the sensitivity of the camera has changed with time, differentially across the faceplate.

Reconfiguration of the LWR Camera The camera engineers believe that a reduction of the UVC voltage in the LWR camera will eliminate the flare, at least for a few years. At some time in the future, as yet undetermined, the LWR camera will be reconfigured with the lower UVC voltage. This is expected to cause a loss in sensitivity of about 36%. In addition, significant recalibration of the camera may be required. It is expected that the LWR camera would serve as the backup to the LWP camera in this mode.

Information on the LWP Camera For the last two years, Goddard and Vilspa have been making an effort to derive appropriate calibrations for the LWP camera. A provisional absolute calibration for LWP low dispersion spectra has been created (Blades and Cassatella, this newsletter). This calibration was implemented at Goddard on October 19. The new calibration has not been fully evaluated, so caution is advised when comparing fluxes derived from LWP and LWR spectra due to possible systematic differences in the calibrations and long-term LWR sensitivity changes (see Sonneborn and Garhart, this Newsletter). The LWP continues to have problems with its scan control logic. However, modifications to the ground control software appear to have circumvented most of these problems. Recent NASA IUE Newsletter articles describing the LWP camera are the following:

"User's Guide for the IUE LWP Camera" J. Settle, T. Shuttleworth, and M. C. W. Sanford, 1981, NASA IUE Newsletter No. 15, p.97.

"Corrections to the User's Guide for the IUE LWP Camera" A. V. Holm, 1981, NASA IUE Newsletter No. 15, p.95.

"S/N Characteristics of the LWP and LWR Cameras at High Dispersion" M. Barylak, 1983, NASA IUE Newsletter No. 21, p.55.

"Use of the LWP Camera and Its Absolute Calibration" J. C. Blades and A. C. Cassatella, 1983, NASA IUE Newsletter No. 21, p.62 (correction given in this Newsletter)

"Low-Dispersion Quick-look Sensitivity Monitoring. VII." G. Sonneborn and M. Garhart, 1983, this Newsletter.

Information on the LWP sensitivity function and estimating exposure times is available in the IUE Seventh Episode proposal instruction package and in the IUE Observer's Guide (Preliminary Version).

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NEW BATTERY MANAGEMENT POLICY

A new policy instituted by the IUE Project limits the number of times the batteries may be discharged and thus the beta angles at which observations may be obtained.

Project Adopts New Policy The primary function of IUE's two batteries is to provide spacecraft power during the semi-annual earth shadow seasons. In the past, the batteries have also been used to supplement the power generated by the solar arrays in order to perform observations at high and low beta angles. The slow degradation of the solar array output, about 6%/year, has meant an increased demand for use of the satellite's batteries to support Guest Observer observations. Recently tests of the discharge and recharge characteristics of IUE-type batteries have been considered along with the IUE Project's goal of prolonging the lifetime of the satellite. These considerations have prompted a policy change which limits the battery use for science operations. The new policy is described elsewhere in this Newsletter by the IUE Operations Scientist K. Kalinowski.

New Beta Limits Observers will normally need to plan their observations in order to avoid discharging the batteries. Recent experience indicates that the 22.5 volt limit will be reached relatively quickly at extreme beta angles (beta < 20 or beta > 120). The length of time to reach the limit will depend upon the spacecraft power requirements (exposure time, camera reads and preps, science heater configuration to maintain telescope focus, maneuvers, wheel unloads, rangings, etc.). Recent experience indicates that the power-positive region (no observational restrictions) is now about 25 < beta < 115.

Future Impact Predictions of the solar array output for the future indicate that the beta limits over which observations may be made will change at a rate of about 3 degrees per year at high betas and somewhat less at low betas (see also Sonneborn's article on scheduling in this Newsletter). Thus the range of betas outside of the OBC heating zone suitable for observations will shrink somewhat with time.

Beta Calculations The new restrictions make it increasingly important for Guest Observers to check the betas of their targets while planning their observations. One may compute the beta angle of a target for a specific day by the following equation (Schiffer, 1980, NASA IUE Newsletter No. 9, p.32):

$$\text{Beta} = \cos^{-1}\left\{-\sin D \sin D_o - \cos D \cos D_o \cos (A - A_o)\right\}$$

where
A = right ascension of the target
D = declination of the target
A_o = right ascension of the Sun
D_o = declination of the Sun

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IMAGE REPROCESSING DUE TO DISK ERROR

During the summer the IUE Project discovered that some of the images processed in January through March were affected by a disk drive error on the processing computer. Observers whose data may be affected by the error were notified of the problem in August. The questionable images include only those within the following image numbers that were processed at Goddard: LWP 1754 - 1820, LWR 14957 - 15435, SWP 18912 - 19409, and FES 1393 - 1399.

These images are being reprocessed and compared to the originally processed spectra to find the errors in the data. Observers are being notified of the status of their images. They will receive new data products to replace any that were affected by the disk error. For images that require correction, the processing date and thus the public release date will be changed to the later date.

The entire reprocessing effort is expected to be complete some time in December. At present about half of the images have been reprocessed and checked against the original processing. An error rate of about 10% is expected. However for low dispersion spectra the chances that the errors affected the spectra are small.

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IUE PERSONNEL CHANGES

Dr. Ronald E. Pitts, an Ohio State University alumnus, has joined the staff as a Resident Astronomer. Ron comes to us from a position at Ball State University in Indiana where he pursued his interests in laboratory astrophysics.

Al Holm has taken new duties at the Space Telescope Science Institute. Tom Ake has taken over his responsibilities overseeing the IUE operations and calibration staff.

Bob Panek has left IUE to take a job with a company in Boston. Randy Thompson, who formerly worked with the image processing group, has become the RDAF Manager. Dr. Nancy Evans has joined the staff as the RDAF Spectroscopist. Nancy, who is interested in Cepheid variables, comes to us from the University of Toronto.

We are interested in hiring another IUE Resident Astronomer. If you or someone you know is interested in a challenging job with crazy hours, please call Tom Ake (301-344-7445).

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WEATHER FORECAST

0% chance of radiation during most of the US1 shift, with increasing probabilities of significant background radiation through most of the US2 shift. Expected highs in the range of 1.5 to 3.3 volts, with lows near zero. Long range outlook: mixed, with periods of low and high radiation.

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