

Improper Scaling of Certain IUE Spectral Files

On 8 June 1979 a problem was corrected in the GSFC IUESIPS applications program ITOE which performs the scaling of IUE extracted fluxes to the integer format used in writing Guest Observer magnetic tapes. Previous to that time, a problem had occurred for extracted spectra which are entirely negative, and for extracted spectra in which $|f_{\min}| > |f_{\max}|$ where f_{\min} is the algebraic minimum flux and f_{\max} is the algebraic maximum flux. In the former case, the old scaling algorithm incorrectly returned a scaled integer flux of zero. In the latter case, fluxes more negative than f_{\min} were not correctly scaled, but larger fluxes were correctly handled. Typically, these conditions are most likely to be encountered in the background spectra of images with a low level background superposed on an abnormally low null pedestal. Since it is the low null level which causes the negative IUE fluxes (because of the manner in which the intensity transfer function is extrapolated at the low-intensity end), most images subject to the scaling problem were from the SWP camera, in which significant drifts of the null level have been observed.

The problems which have been outlined here applied only to the magnetic tape files (CalComp plots are unaffected), and only under the infrequent circumstances leading to certain negative fluxes as described above. The first type of problem is easily evident, as all scaled fluxes and the scale factors J and K are zero. The second type of problem may not be as readily apparent. If a problem with a particular background spectrum is suspected, a reasonable check would be to compare the background spectrum to the difference of the gross and net spectra; the gross-minus-net should be equivalent to the background smoothed twice by a 15-point running average.

The modified version of the program ITOE which was put into production on 8 June 1979 is free of the difficulties present in the version used prior to that time and has no known scaling errors. Should you encounter instances of the problems described above in data reduced before 8 June 1979, please inform the Image Processing Center (IPC) at the IUE Observatory so that the appropriate reprocessing can be scheduled. Since it is impractical for IPC to survey

all data reduced so far to check for the problem, we must depend on notification from Guest Observers to identify affected images.

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