IUE DATA REDUCTION

IV. CalComp Plots of High Dispersion Net Ripple-Corrected Fluxes

Up until the present time, CalComp plots of IUE net ripple corrected high dispersion spectra have displayed all extracted data, including redundant points (i.e., data points at wavelengths which appear in more than one echelle order). In order to increase the usefulness of the net ripple corrected plots, however, the applications program CUTMERGE is now used to select the range of points to be plotted in each order so as to suppress redundant plotting. The algorithm for selecting the wavelengths defining the plotted range in echelle order m is

$$\lambda_{min}(m) = 2K/(2m+1) \qquad (1)$$

$$\lambda_{max}(m) = 2K/(2m-1) \qquad (2)$$

where K is the echelle grating constant (with the same values as are used for the echelle ripple correction; K=137,725 for SWP, K=231,150 for LWR)

The first plotted point in order m is that which has the smallest wavelength greater than or equal to $\lambda_{min}(m)$; according to the standard convention, that point is plotted with a square box symbol signifying the start of an order. The last point plotted in order m is that which has the largest wavelength less than or equal to $\lambda_{max}(m)$. Thus the possible overlap between two orders is limited to at most a single point at either end of an order.

Presentation of the data in this form has several advantages. First, the plots are considerably less confusing than the previous standard plots (especially at the 10 Å/inch scale) because the overlap has been removed. The region of each order which is suppressed is the region where the ripple-corrected flux is least certain and where the data are intrinsically the noisiest, i.e., at the ends of each echelle order, which occur near the edge of the detector. Second, because CUTMERGE eliminates most of the large spurious "spikes" seen at the extremes of the orders in the full net ripple corrected spectra, it is possible to let the new plots use the automatic scaling routine to assure an adequate vertical scale. (Automatic scaling was not feasible with the old form of the ripple-corrected plots because the noise spikes would determine the vertical scale; consequently, a fixed vertical scaling had to be utilized for all cases, which meant that under-or over-exposed spectra would not be optimally displayed).

It should be noted that the truncation being performed is done only on the CalComp plots, and only on the net ripple corrected spectrum. Plots of the gross and smoothed background spectra are still presented with their full overlap so that verification of questionable features by virtue of their occurrence in more than one order, for example, may still be done as before. Furthermore, the contents of the Guest Observer tape spectral

files (gross, background, net, and ripple-corrected net spectra) remain unchanged, i.e., no truncation is performed in the tape files.

Figure 1 illustrates the appearance of a net ripple corrected spectrum plotted using both the new and old procedures. The image is LWR 4487, a 9-second exposure of Eta UMa.

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