UV OBSERVATIONS OF CLOSE BINARY STARS

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Ultraviolet spectroscopic observations made with the Copernicus and IUE spacecraft have been analyzed. The observations represent a collaborative effort with G. J. Peters.

Observational evidence supporting the existence of a turbulent accretion layer has been discussed earlier by Peters. Ionization equilibrium calculations suggest the following physical conditions in the layer: $T \sim 125000$ K°, $N_e \sim 10^9$ cm^{-3}; composition: Nitrogen rich, carbon poor. Observations also show the region to be turbulent and not co-rotating with the accreting star. We conclude that the region is formed by new material arriving from the secondary and that the accretion process is turbulent.

Low velocity gas stream lines have been seen in many long period semi-detached systems. Observations of these lines in HR 2142 (P-81^d) suggest that they arise not in a gas stream but in a portion of the low density disk that is heated and partially disrupted by the penetrating gas stream. The data require that the gas stream to either be very thin or clumpy.

Analysis of gas stream lines in shorter period eclipsing systems have yielded an estimate of their thickness. At expected stream densities the lines must be saturated. Thus, the depth of the line is a measure of the fraction of the stellar surface covered by the stream. Results indicate that stream sizes are consistent with theoretical calculations.

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