binaries where the disk is occulted by the cool companion star. We employ a maximum entropy technique to reconstruct the two-dimensional brightness distribution of the disk from observed eclipse light curves.

Data using synthetic light curves generated from a single disk model show that the disk brightness distribution can be accurately reproduced. The temperature maps for the accretion disks in RW Tri and UX UMa are derived from 2-color eclipse photometry.

Session 8: Stellar Spectra
1010–1700 (Room 239)
(Display Presentation)

08.01 BF Orionis: A Peculiar Pre-Main Sequence A Star
S. C. BARDEN, J. A. NOUSEK, AND L. W. RAMSEY, Pennsylvania State U. Observations of BF Ori were obtained at the Penn State University's black Mosbacher Observatory in the spectral regions surrounding 4600 Å, H-beta, 5200 Å, Na D, and H-alpha. The spectra were obtained using the 1.2 m telescope feeding a Fiber Coupled Spectrograph (Ramsey et al., 1981 B.A.A.S. 13, 836) with a SIT detector giving from 12 to 18 Å/mi resolution with an effective resolution of ~1 Å for the various regions. BF Ori has been classified A-F type by Herbig and Rao (1972, Ap.J. 174, 401). They commented that the absorption spectrum is very peculiar with many of the ionized metal lines either doubled or strongly asymmetric. Subsequently Pravdo and Marshall (1981, Ap.J. 248, 591) have identified BF Ori as an X-ray source with Lx ~ 1.5 x 10^30 erg/s. In addition, Pravdo and Noeske (private communication) have observed strong Mg II emission in the U.V. along with other high excitation lines. We present optical data showing the strong enhancement of Fe II and other ionized metal lines over normal A stars. The Na D lines appear quite strong in absorption, while the H-alpha line is also present in absorption. H-alpha exhibits an emission component with photospheric absorption in the core and wings. Variations in the emission profile were found to occur on the time scale of a few days. The H-beta line is however not in emission but appears to have asymmetry in its core. Both the H-alpha and H-beta absorption wings are indicative of an early A star with luminosity class IV or V, but the absorption core in H-beta is quite deep and seems to indicate a higher luminosity than is represented by the wings.

08.02 Fluorescence in Stellar Chromospheres
K. G. CARPENTER & R. F. WING, Ohio State U., AND R. B. STENCHEL, JILA, U. Of Colo. & WBS.—The physical conditions in the chromospheres of late-type stars, where a radiation field containing strong emission lines flows through a rarefied gas, are ideal for the operation of the fluorescence mechanism. A study of the occurrence of these mechanisms in different kinds of stars can reveal differences in the geometries and temperature structures of their outer atmospheres. We review and illustrate several fluorescence mechanisms that have been identified as responsible for emission lines in the ultraviolet spectra of cool stars observed with the IUE satellite. These include: (1) the well-known ly alpha-OI mechanism, by which ly alpha emission is absorbed by OI leading to emission in the UV lines 113102, 1305, 1306, and 1461 as well as two IR lines of OI; this commonly occurs in K and M giants but not in M dwarfs whose above-chromosphere temperatures are too high for oxygen to be neutral; (2) the OI-SI mechanism discussed by Brown and Jordam, in which two of the OI lines serve as the exciting lines, leading to emission in several lines of SI; (3) the CO fluorescence described by Ayres, Moore, and Links, which produces a large number of relatively weak emission lines throughout the 1300-1800 Å region in Arcturus and other K and M giants; here the exciting lines are from OI, CI, and HII; (4) the Mg II Fe I fluorescence, by which the absorption of Mg II 2795 photons produces emission lines 2328, 2844 of UV multiplet (44) of Fe II; this seems to occur in all stars which have cool, neutral material above their chromospheres rather than transition regions and coronae; and (5) the Co II fluorescence, recently identified in high-resolution spectra of Arcturus, by which an emission feature at 2344 due to FeII + SiII coincides with a Co II absorption line, leading to emission in 2330 of Co II.

08.03 IUE Observations of B9 Hercculis: Variability and Mass Loss, S. A. LAMB, C. L. NEESER, B. D. CHAMPAGNE-URBANA. The F2A star B9 Herculis is known to experience fluctuations in radial velocity and light output, as well as considerable variations in the line profiles of Na and the Na D lines on the timescales of months and years, respectively. It is one of the few F-type supergiants showing spectral evidence for mass loss in the form of Doppler shifted circumstellar features. We have obtained high resolution spectra of this star in the wavelength range 11893-3031 Å using the IUE satellite at intervals spanning the time period October 1979 to February 1981. We find that the Mg II resonance lines at 2795.5 Å and 2802.7 Å have well delineated cores from which a terminal velocity of approximately 200 km/sec can be estimated. This is comparable to the escape velocity at the stellar surface and we deduce that mass is leaving the system. The mass loss rate can be estimated using a particle density obtained from an analysis of the ultraviolet Mg II lines. However, the rate thus obtained is model dependent. There are no pronounced variations in the spectra over the time period of our observations.

We wish to acknowledge support from NASA grant NASA NAG 5-85 and from the University of Illinois Research Board.

08.04 The Faintest Wolf-Rayet Stars in the LMC, P. Massey, DAO, AND P. S. Conti, JILA. How faint are the faintest WRs? The traditional answer, N5 ~ 3.8, has been based on the photometry of LMC Wolf-Rayets by Smith (1968 MNRAS 140, 409). However, the recent objective prism searches by Aszopardi and Breyer have found numerous faint (B15) WRs. We have observed many of these with the CTIO SIT Vidicon. Our absolute spectrophotometry shows that the faintest (known) WR.