7.10
Simultaneous Observations of the Hα and Mg II Resonance Line Profiles in the T Tauri Star SU Aurigae
M.S. Giampapa (NSO/NOAO) and C.L. Imhoff (CSC)
We present observations of the Hα line profile and the Mg II λ and k line profiles in the T Tauri star SU Aur obtained near-simultaneously with the NSO McMath/CDS telescope and the International Ultraviolet Explorer (IUE) satellite, respectively. The ground-based and satellite data were acquired during 17-23 October 1987 and at least two rotation periods on this rapidly rotating pre-main sequence star. We will discuss the nature of any observed variability, particularly evidence of rotational modulation in the blue wings of the line profiles. Such modulation would be expected if the wind regions are intimately linked to magnetic field configurations, similar to solar coronal holes, on or near the stellar surface.

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7.11
Transient Features on FK Comae
D.L. Buzasi, D.P. Huememoerder, L.W. Ramsey (Penn State)
FK Comae, a rapidly rotating G2 III star, was extensively observed from March 27 to April 13, 1987 using the Penn State fiber optic echelle spectrograph on both the 0.9 and 2.1 meter coude feed telescopes at Kitt Peak National Observatory. The star is variable, with a 2.40 day period, and exhibits large variations in chromospheric and transition region lines. The star is particularly notable for its large v sin i of 160 km/sec and its anomalously broad H-alpha line (~600 km/sec). The source of these properties is largely unknown.

The present observations reveal the presence of a transient feature in both the H-alpha and H-beta lines. The feature takes the form of an emission "bump" and its position in both lines is correlated with the phase of the star. In addition, the velocities derived from the positions of the bump are typical of FK Comae's rotational velocity, leading us to believe that the bump is representative of a hot spot or spots on the stellar surface. The strength of the bump in both lines will be examined in light of this hypothesis.

7.12
Opacity Sampled, Spherically Extended Model Atmospheres for Cool Stars
J.A. Brown, H.R. Johnson (Indiana University), D.R. Alexander (Wichita State University), G.C. Augason (NASA/AMES), R. Wehre (Inst. fur Theor. Astrophysik, Heidelberg)
Model atmospheres with spherical symmetry are needed for supergiant and more variable stars, and we have constructed such models. For treating spectral lines we use opacity sampling, with an improved frequency set and opacities. We also employ recent improvements in molecular equilibrium data. We avoid the straight-line approximation of the opacities of TiO, H$_2$O, C$_2$H$_2$, and HCN by explicit inclusion of molecular lines from predictions or from a statistical method (Alexander et al., 1986 IAU Symp. 122), all of which represent major improvements in the calculation of extended atmospheres. We present results from our calculations and compare them to previously published extended models and similar plane-parallel models for a range of input parameters. The new models for oxygen-rich stars are substantially less extended than previous spherical models because of lower opacities; the straight-line approximation obviously over-merchets the models and results in lower gas pressure and greater radial extent. Consequently, extension effects may be smaller in cool atmospheres than has previously been suggested.

7.13
Emission Line Variations in the UV Spectrum of Gavurz
K. G. Carpenter (CAS/U. of Colorado at NASA/GSFC)
The discovery of significant variations in Fe II emission line profiles and strengths in IUE spectra of the M3 giant Gamma Crucis, taken during the period 1978-1986, has been reported by Carpenter 1986, (New Insights in Astrophysics: 8 Years of UV Astronomy, ESA SP-326, p. 99). The observations reported herein, represent the first clear evidence of meaningful changes in the Fe II spectrum of a single, non-convective cool star. The changes appear to be long-term in nature, occurring over a time span of years, although additional, more frequent observations are needed to firmly establish this interpretation. In this paper, I present further details of the variations seen in the original set of spectra and discuss the contents of more recent IUE spectra obtained in August 1987. In brief: the high resolution IUE data covering the region 2200-3200Å indicates that the intrinsically strong Fe II lines have increased in strength, become substantially broader, and developed self-reversed (i.e., double-peaked) profiles, while the earliest data showed only the single-peaked, relatively narrow lines characteristic of M giants. The effect decreases smoothly with decreasing intrinsic line strength, with the weaker lines showing no change in their observed profile or integrated flux. Further IUE observations designed to check the short-term stability of the stellar chromosphere and wind are planned for the spring of 1988.

7.14
Abundances of Very Heavy Elements in Extreme Population II Stars
C. Sneden, K.X. Gilroy (U. Texas), C.A. Pilachowski (EPNO), J.J. Cowan (U. Oklahoma)
New abundances for elements in 20 extreme Population II stars have been determined. The detailed abundance patterns derived for stars with [Fe/H] ≤ -2 indicate a dominance of r-process syntheses for the very heavy elements (Z>30). Only at higher Fe abundances does the s-process make substantial contributions to these elements. This result suggests a rapid (10$^9$ years) buildup of the overall halo metallicity to [Fe/H]=-2. A considerable scatter is seen in the total very heavy element contents with respect to Fe from star to star of the present sample. Therefore it is apparent that local supernova r-process nucleosynthesis events were important in the formation of the chemical compositions of extreme Population II stars.

7.15
Predicted K Magnitudes for Stars near the North Celestial Pole
Y.-J. Kuan and R. F. Wing (Ohio State U.)
The Two-Micron Sky Survey (IRCS: Neugebauer and Leighton 1965; NASA SP-3047) is nearly complete listing of stars brighter than K = 3.00 north of declination -33°, but the small (254 sq. deg.) region north of +81° was missed because of mounting constraints of the survey instrument. From the density of IRC sources in other high-latitude regions, we would expect this polar cap area to contain ~22 brighter stars brighter than K = 3.00. These can be found from a study of existing catalogues. For stars brighter than $V$ = 6.5, K can be predicted fairly accurately from the visual magnitudes and spectral types in the Catalogue of Bright Stars. For fainter stars down to $V$ = 9, K can be predicted (less accurately) from data in the SAO Star Catalog, and still fainter M