to provide data for a study of the spatio-temporal variations of the emission core. Our study provides information on the range of line profile variations in the quiet Sun, and on the distribution functions of quantities such as the H-alpha (integrated core intensity) and the V/R ratio. We find that the range of profile variation is larger than that covered by the models A-F of Vernazza, Avrett and Loeser (1981 Ap. J. Suppl. 45, 633). In particular, the darkest profiles do not have core emission, indicating that the chromospheric temperature gradient is very flat in the coolest parts of the chromosphere. The time variabilities of the line profile at selected spatial locations show clearly that the 200s chromospheric oscillation involves upwardly propagating waves which lead to intense chromospheric heating in the cell points.

19.12 Ultraviolet Spectroscopy of the 1981 Eclipse of 32 Cyg. R.E. STENGEL, JILA, D. of Colo. & NBS, R.J. CHAPMAN, G. KONDO, NASA-Goddard, and R.P. WING, Ohlo State U.—An outstanding data set consisting of high and low resolution observations was obtained during 16 separate epochs during the March-April 1981 eclipse of the Zeta Aur system, 32 Cyg (K5 Ib + B5 V). From these data, the following information is derived: a) variation in the continuous opacity as deduced from the minimum wavelength of the detectable continuum during eclipse phases; b) evidence for systematic flows in the K supergiant atmosphere as deduced from time dependent changes in the absorption and emission components of the Mg II lines; c) time dependent changes in the emission spectrum during eclipse to compare with the Zeta Aur eclipse observations and conclusions (Stencel & Chapman 1981 Ap. J. Dec. 15) regarding the origin of the sub-coronal lines, and to relate variations to the optical photometry by K. Gusev which suggests tidally-driven pulsations in the K supergiant; d) from curve-of-growth analysis of over 10000 Fe II and Fe I lines, chromospheric temperatures are shown to extend several K star radii, in agreement with extrapolated optical studies and supporting recent empirical evidence that extended chromospheres are ubiquitous red giant features. We will discuss progress on models for the system which include the source of the high speed wind flows and the phase related variations. This work will ultimately appear in the Ap. J. Supplement Series. We thank R.W. Ayres, G.S. Basri and D.J. Mullan for assistance in obtaining some of the observations.

19.14 Occultation Angular Diameters of a Tauri by Least Squares and Deconvolution. NATHANIEL M. WHITE and TOBIAS O. KREIDL, Lowell Observatory. — Angular diameter results are compared for two analysis techniques applied to lunar occultation observations of the K giant a Tauri. The iterative least-squares model-fitting procedure and the Scheuer deconvolution method were applied to seven independent observations in ten different colors. The observations were made at the Lowell Observatory between 1978 and 1980.

19.13 Excitation of the Chlorine I Line at 1351 Å. R.A. SHINE, B.E. WOODGATE, NASA-GSFC, T.R. AYRES, LASP-U OF Colorado. — A moderately strong line appears in the solar spectrum at 1351 Å, which has been identified by Cohen et al. (1978, Astroph. J. Suppl., 37 443) as originating from CI I. Considering the low abundance of chlorine, this line is surprisingly strong and using spectra obtained with the Ultraviolet Spectrometer and Polarimeter on the Solar Maximum Mission satellite we find that it is also much stronger than other nearby members of the same multiplet which would be expected to be of comparable or greater strength. Closer investigation revealed that the 1351 Å line can be excited through a fluorescence mechanism driven by the strong C II line at 1335 Å. A Chlorine I line at 1335.72 Å, which shares the same upper level of the 1351 Å line is coincident with the C II line. The lines at 1363.45 and 1347.24 share a different upper level and do not directly benefit from this radiative excitation. Calculations using standard chromospheric models and an approximate form of the C II radiation field indicate that the fluorescence mechanism is over 1000 times more important than collisional excitation and predict the observed intensity of the 1351 Å line to within a factor of 2. The 1347.24 and 1363.45 lines appear to be excited primarily from collisions between the upper levels of the multiplet allowing a measure of this line structure collision rate. Based on this excitation mechanism we expect the 1351 Å line to be prominent in late type stars showing strong C II emission. It shows up prominently in a high dispersion spectra of Capella taken with the International Ultraviolet Explorer. This line should be useful for investigating Chlorine abundances in stellar chromospheres.

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20.01 Variable Stars and Cosmological Speculation in the Century after Descartes. W. ASHMORE, U. Missouri - KC. The effect of the nova of 1572 on the undermining of Aristotelian cosmology is well attested. Not so well understood is the role of novae and (once discovered) periodic variables in building up new cosmologies in the wake of the Aristotelian demise. Descartes was the first to make extensive use of novae, arguing that they were not only evidence for the death of stars, but could explain the origin of comets and planets, and his followers, such as Fontenelle, Maupertuis, and De Maillot, attached great significance to changes in the stars. Newton, on the other hand, with visions of a more stable cosmos, was less impressed with variables, and he and his followers generally tried to downplay their significance. Perhaps surprisingly, by the middle of the 18th century the attention given to variables had greatly diminished, and they played only a minor role in the three great cosmological systems of Kant, Wright, and Lambert. This was partly a result of the ascendency of Newtonianism, partly because no new variable or nova had been identified since 1704, but mostly because a new phenomenon had been discovered which was considered far more significant as an indicator of cosmic structure and evolution, namely the proper motion of stars.