broadening rather than turbulence or wind expansion may be the predominant line broadening mechanism in giant stars similar in effective temperature to the Sun. Thus broad profiles of lines formed at 10^4 K need not be evidence for a wind of 10^5 K gas as Hartmann, Dupree and Raymond (Ap. J., in press) suggest for a TrA.

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18.10 A Model of the Outer Atmosphere of § Ceti, K. ERIKSSON, JILA, Univ. of Colo. & NBS, T. SIMON,* JILA and Univ. of Hawaii and J. L. LINSKY,** JILA.
A one-dimensional, homogeneous semi-empirical model of the chromosphere and transition region of § Ceti (KI III) was constructed using JUE observations of Mg II h and k, C II λ1335, C III λ1375, C IV λ1549, Si II λ1530, Al805+1817, and Si III λ1892 as constraints. The Mg II lines were calculated assuming partial redistribution, while the other lines were calculated using the complete redistribution assumption. The properties of the outer atmosphere of this giant star are of special interest since the star is located in the H-R diagram close to the boundary between giants with transition regions and giants with massive cool winds. Since this star is one of the coolest giants with detected but weak transition region lines, estimates of its top pressure are of considerable interest for comparison with estimates based on its X-ray flux and for comparison with hotter giants.

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18.11 The Unusual Outer Atmosphere of § Pegasi (KO type), M. SCHINDLER, R. STENGEL and J. LINSKY,* JILA, U. of CO & NBS, D. HELFAND,* Columbia Univ. and G. BASRI,* U. Cal. Berkeley. *We present Einstein and JUE observations of this peculiar late type bright giant star which exhibits strong soft X-rays and numerous high temperature far UV emission lines, indicative of a geometrically thin transition zone and extended corona which is solar-like. This information makes § Pegasi a clear violator of the statistical trend first noted by Linsky and Haisch which divides coronal type G giants from the K and M giants that lack high temperature outer atmospheres and possess only cool extended chromospheres. § Pegasi is peculiar in many ways: It has been classed as a mild barium star, but the lack of radial velocity variations appears to rule out important binary effects. The normally agreeing width-luminosity relations for Ca II and Mg II emission disagree by 4 magnitudes, in the sense that Mg II is excessive compared to Ca II and other distance indicators. Further, the Mg II profiles have been observed to undergo astounding asymmetry variations while the Ca II line showed no change whatever. These lines are normally thought to have roughly similar formation characteristics. We will present semi-empirical model outer atmospheres for § Pegasi based on spectral synthesis of chromospheric and transition region lines and constraints placed on the corona by the soft X-ray flux. Attempts to compare the "increased activity" with solar phenomena will be made.

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Continuing observations of variability in the Mg II h and k emission features in late-type stars of low gravity have tentatively revealed a variability boundary in the HR diagram. In giants and supergiants of type M and late K, we observe striking (≤ 10%) variations in the line profiles, and in the total flux. In giants of type G and early K, variations are small (≤ 10%). The variability boundary lies close to boundaries which have been reported in temperature and velocity (Stencel and Mullan, Ap. J., 238, 221; ibid., 241, 718, 1980), and in He I 10830 Å variability (O'Brien, NAS 12, 747, 1980). The flux changes which we observe correspond to energy release rates which are comparable to, or larger than, those in the largest solar flares. If these variability events are flare-like in nature, they are presumably of magnetic origin. Magnetic stability may serve to unify the interpretation of the various boundaries which appear to overlap in the HR diagram. Poe's work on helmet streamers in the solar atmosphere (Sol. Phys. 3, 578, 1968) suggests that if a star has a thermally driven wind with a sonic point lying closer to the center of the star than 2 Rg, closed magnetic loops cannot find magnetohydrostatic equilibrium. The locus where this occurs in the HR diagram can be obtained by a method analogous to that described earlier (Ap. J. 226, 151, 1978): the locus coincides with the Mg II mass-loss boundary. We propose that unstable loops help to drive rapid mass loss non-thermally in late-type giants. The stochastic nature of emergence of new loops at the stellar surface would then be responsible for the inherently variable nature of the mass-loss process among such stars.

18.13 Stellar Chromospheres and Coronae, R.G.ATHAY, MAD/MCC.

The basic structural features of the solar chromosphere and corona are identified either with physical properties of the plasma or with properties of the energy input. It is argued that those properties identified with plasma physics should be relatively invariant whereas those identified with the energy input should vary from star to star. Energy input (ergs cm⁻³ s⁻¹) to the solar atmosphere has at least two maxima, one in the low chromosphere and a second in...