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Mount Stromlo Photon Counting Array detector on the A.N.U. 2.3-m telescope at Siding Spring. The ultraviolet spectrum was obtained with IUE through the large aperture and using the low dispersion mode of the LWP camera.

Chromospheric emission is detected in the Mg II and Ca II cores and in the wing of the Hα line. These observations demonstrated unequivocally that AS0 possesses a chromosphere. They indicate that the emission wings observed in Hα arise naturally in a chromosphere and not from a circumstellar shell. The Ca II K emission core is asymmetric with the short wavelength emission weaker than the long wavelength emission - a signature of mass outflow. The Mg II flux per unit area of the stellar surface is commensurate with that found in metal deficient field giant stars, and with that of low activity Population I giants. Surprisingly, the level of chromospheric activity among such giants does not appear to vary significantly with differences in age or metal abundance suggesting a physical origin different from the magnetic dynamo assumed present within Population I stars.

22.17
Time-Variations of the High Outflow Velocity H2O Emission From The Stars IRAS1634-3814, IRAS19134+2131, and W43A
L. Likkel (UCLA), R. J. Maddalena (NRAO), M. Morris (UCLA) IRAS1634-3814, characterized as an evolved star with a bipolar outflow, has H2O emission indicating an outflow velocity of 130 km s⁻¹. This is an unparalleled velocity for an outflow from an evolved star, and the H2O masers are suggested to arise in high velocity gas forced out the polar axes by, or as part of, a wind from an accretion disc in a binary system. Two related objects are IRAS19134+2131 and W43A, with H2O maser velocity spreads of 132 and 180 km s⁻¹, respectively. These three objects define a new class of high-velocity bipolar outflows from evolved stars.

One of the defining characteristics of this class is that the intensities and velocities of their emission peaks change rapidly with time. We have monitored the H2O emission profiles of all three objects with the NRAO* A 140 foot telescope at Green Bank at 6 epochs from 1988 January to the present. Drastic temporal changes in the line profiles are observed; some lines have disappeared and others have appeared at new velocities. There is no evidence for smooth velocity drifts of individual lines; preliminary analysis suggests that the observed velocity variations reflect the appearance and disappearance of individual lines.

If indeed mass loss from late type stars occurs by the ejection of cloudlets of material, as indicated by VLA observations, the cloudlets will emit only while at the distance where conditions for H2O masing are appropriate. The intensity of a given feature therefore reflects the variation of the cloudlet characteristics as it moves away from the star. We consider the possibility of detecting the passage of individual cloudlets, which would allow us to probe the conditions and gauge the size of the masing region.

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22.18
Correlations Between Hε I D3 and Rotation for G and K Dwarfs
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The presence of He I D3 absorption (5876 Å) in stars cooler than Teff ≈ 7000 K is evidence for non-thermal heating in stellar atmospheres. We have obtained high resolution, high S/N spectra of the D3 line at ESO and the Crimean Astrophysical Observatory. Combining these data with previous measurements, we have investigated correlations between D3 equivalent width, rotation and other stellar parameters for a set of over 50 G and K dwarfs. We find a strong, roughly linear correlation between D3 equivalent width and stellar angular velocity, Ω, for Ω < 0.25 days⁻¹. Correlations with D3 and Rossby number show significantly more scatter. For Ω > 0.25 days⁻¹, the equivalent width of D3 appears to remain constant or even decrease, possibly depending on spectral type. We discuss the implications of these results for our understanding of stellar activity and He I D3 line formation.

22.19
Luminosity Variations of Stars Similar to the Sun
G.W. Lockwood and B.A. Skiff (Lowell Observatory)

Using differential b-y photometric photometry, we have established the variability characteristics of 36 F, G, and K main-sequence program stars and of their 61 field comparison stars. The chromospheric activity levels of the program stars bracket the Sun according to H and K line emission strengths monitored previously by O. C. Wilson. After four years of continuous monitoring, our principal conclusions are:

1) Half the program stars and one-quarter of the comparison stars are consistently variable, year after year, at levels of 0.3% rms or greater on intraseason time scales. Of the 13 unby standard stars we monitored, 5 are variable. K dwarfs are far more likely to vary than F and G dwarfs.

2) Half the program stars and 8 comparison stars exhibited a four-year range of seasonal mean brightness greater than 0.5% and are considered to be confirmed microvariabilities. About 40 stars are members of pairs whose four-year range of variation was less than 0.3% and are considered to be "constant"; 10 stars are members of pairs with a range of about 0.1%.

3) Microvariability on intraseason and interseason time scales increases with increasing chromospheric emission. At levels of the chromospheric emission ratio greater than about twice the solar value, microvariability is ubiquitous.

4) The observed variability of total solar irradiance is consistent with the variability of chromospherically similar stars.

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22.20
Detection of a cool wind from the K dwarf in V471 Tauri
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We have obtained IUE high resolution spectra of the detached binary V471 Tauri in order to search for signatures of mass loss from the K dwarf. Spectra at various phases indicate the presence of strong variable discrete absorption components in lines of several different elements and in two stages of ionization. Since Roche lobe overflow does not occur in this system, we propose that the absorption features arise in a wind from the K dwarf, with a terminal velocity of about 800 km/sec. The existence of discrete structures suggests that the wind is either not spherically symmetric or non-steady, or both. On the basis of the relative strengths of the absorption features in lines of different ionization, as well as from indirect arguments, we suggest that the wind is cool, with a temperature of no more than a few times 10⁴ K. Possible reasons for the existence of such a cool wind will be discussed.

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