141ST MEETING, TUCSON, ARIZONA

35.02.05 On the Solar Microturbulence. I. FURENLID, Kitt Peak Nat'l. Obs., and A. R. CONNOLLY, Univ. of British Columbia. We have determined the solar microturbulence from spectra of integrated sunlight in order to make a direct comparison between this parameter in the sun and in stars of the same spectral class. High-dispersion spectra, 2.2\AA/mm, of the moon were obtained in the coudé spectrograph of the 2.1-m telescope at Kitt Peak. Equivalent widths of lines in the spectral region 4600\AA-4800\AA were measured. These widths were used in a stellar model atmosphere abundance analysis. Consistent values of effective temperature, gravity and microturbulence were determined by the usual iteration techniques. Particular emphasis is put on discussing the microturbulence parameter.

35.03.05 Photospheric Models Based on the Wings of the Ca II Lines. R. A. SHINE & T. R. AVRES, Joint Institute for Laboratory Astrophysics. We explore the possibility of using the extensive damping wings of the Ca II K and Hβ44 lines as a probe of the temperature structure in the middle and upper photospheres of late-type stars and in features on the solar disk. In order to be useful it is necessary to know the Van der Waals broadening coefficients for these lines. We empirically determine these quantities using the observed average solar profiles and the ISRA photosphere. Our results are in reasonable agreement with previous determinations using other methods. We then derive simple formulas relating the observed intensity of flux versus λ in these lines with the temperature versus column mass density of the atmosphere. A knowledge of the stellar gravity and an absolute calibration of the wing intensities is required. A correction procedure is also outlined but is frequently not necessary. We find that the likelihood of LTE, the relative simplicity of the wing formation problem (which is insensitive to velocity fields), and the temperature sensitivity of the intensities in the K wing combine to make this approach both accurate and convenient. The Hβ44 line can be used together with K to extend the range of the empirical model as well as to provide an important consistency check. These empirical temperature structures can then be applied to obtain complete photospheric models within the framework of assumptions used for the ISRA. We apply our technique and derive some preliminary photospheric models for solar faculae, sunspots, and for the F V IV-V star Procyon (θCMi).

35.04.05 The Chromosphere of α Cyg A. T. C. HEWITT and J. L. LINSKY, Joint Institute for Laboratory Astrophysics and A. W. RODGERS, Australian National Observatory. High resolution plates have been obtained at Mt. Stromlo of α Cyg A and α Cyg B including the Ca II H, K, and infrared triplet lines. We compare the α Cyg A spectra to integrated disk solar spectra which have been degraded in spectral resolution and scattered light similar to the α Cyg A spectra. Since α Cyg A and the Sun are of the same spectral type any differences between the fluxes in the cores of the Ca II lines must be ascribed to differences in their chromospheres. We estimate differences in models for the chromospheres of the two stars and whether such differences are consistent with the hypothesis put forward by A. Boesgaard that α Cyg A is similar to the Sun in a slightly earlier stage of its evolution.

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35.05.05 Copernicus Observations of Chromospheric Emission Lines in Arcturus and Other K Giants. J. L. LINSKY, Joint Institute for Laboratory Astrophysics, H. W. MOOS, R. C. HENRY, and W. E. MCCLINTOCK, Johns Hopkins University. We present Copernicus observations of Arcturus in the Mg II resonance lines (2795 and 2802 Å), Lyman α, Lyman β, OI 1302 Å, Si III 1206 Å, and 0 VI 1031 Å. The Mg II and Lyman-α lines are positively identified and there is evidence of a lower certainty for emission in Lyman β and Si III 1206 Å which we will discuss. The O I and 0 VI lines are not seen above the noise level. The Mg II lines both show two emission peaks which are intrinsic to the star. Lyman α exhibits interstellar absorption which yields an estimate of the local interstellar atomic hydrogen density. We estimate absolute surface brightnesses in these lines and comment on the general features of the Arcturus chromosphere. Recent observations of other K giants will also be discussed.

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