

87.05

The Effect of Clustering on Estimations of the UV Ionizing Background from the Proximity Effect

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There have been several determinations of the ionizing background using the proximity effect observed in the distribution of Lyman- α absorption lines in the spectra of QSOs at high redshift. It is usually assumed that the distribution of lines should be the same at very small impact parameters to the QSO as it is at large impact parameters, and any decrease in line density at small impact parameters is due to ionizing radiation from the QSO. However, if these Lyman- α absorption lines arise in galaxies (Lanzetta *et al.* 1995, Chen *et al.* 1998), then the strength of the proximity effect may have been underestimated in previous work, since galaxies are known to cluster around QSOs. Therefore, the UV background estimations have likely been overestimated by the same factor.

105.01

Studies of the Massive O-Binary 29 UW Canis Majoris

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The spectrum of the secondary star in the massive O-binary 29 UW CMA appears much weaker during the receding phases than the approaching ones, which is a demonstration of the "Struve-Sahade Effect." We previously presented evidence, using IUE ultraviolet data, that a wind obscuration effect, rather than heating enhancement, was the cause of these differences in phase. Furthermore, a feature in the cross-correlation function (CCF) at 0.2 phase appeared to be due to light blue shifted by the stream from a directed wind passing close to the secondary. We present a test of this hypothesis from observations in a number of visual bands with the Georgia State University "Multiple Telescope Telescope."

105.02

Line Bisector Variability in Active Dwarfs and its Relationship to Radial Velocity Variations

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We study absorption line bisectors as diagnostics of the non-uniform spatial and temporal properties of active, cool dwarf stars. We analyze high resolution ($\lambda/\Delta\lambda \approx 125,000$), high signal-to-noise ($200 \leq S/N \leq 500$) line profiles observed with the stellar echelle spectrograph of the McMath-Pierce Solar telescope. We find that various measures of the bisector shape can vary on timescales of days, implying significant spatial non-uniformity of the surface convective and brightness (starspot) patterns. Observations at fixed rotational phase show the bisectors can evolve on timescales of a few rotations, suggesting rapid rearrangement of the stellar surface structures. We also detect some evidence for correlations between changes in bisector parameters and changes in high precision radial velocities. The results are discussed in the context of stellar surfaces and their effect on radial velocity searches for extrasolar planets.

105.03

The UV/Optical Energy Distributions of the A Stars

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We apply a technique developed for fitting the observed energy distributions of main sequence B stars with stellar atmosphere models to a sample of lightly reddened early A-type stars. The technique utilizes an expanded grid of R.L. Kurucz's ATLAS 9 models and involves simultaneously determining all the parameters of the best fitting model (effective temperature, surface gravity, metallicity, and microturbulence velocity) AND the properties of

interstellar extinction (E(B-V) and, sometimes, the shape of the UV extinction curve). For the B stars it has been shown that the models reproduce the observed energy distributions to a level consistent with the expected observational uncertainties (for IUE satellite UV spectrophotometry and optical photometry).

For the A stars, excellent agreement between models and observations is seen in the wavelength range longward of 1500 Å. At shorter wavelengths the models tend to slightly overestimate the emergent flux. We discuss the possible reasons for this phenomenon and illustrate the quality of the fits for a number of A0 V to A3 V stars. The UV opacity in the A stars is dominated by absorption due to many thousands of Fe lines which produce a very distinct opacity signature, visible even in relatively low resolution data. We demonstrate the ability of the fitting procedure to exploit this spectral structure and provide precise and robust estimates of [Fe/H] from low-resolution UV spectrophotometry. Several examples, spanning a factor of nearly 20 in Fe abundances, are shown.

105.04

Effective Temperature and Surface Gravity of Mira Variables

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Synthetic and observed spectra are compared to yield effective temperatures and surface gravities for three Mira variables, R Leo, V CVn, and R CVn as a function of phase. Spectra are synthesized with ATLAS, using model atmospheres obtained from the Kurucz and Indiana University datasets. Experimental data was provided by M.W. Castelaz and E. Messer, and a *best fit* was determined between the two. Zirconium oxide at 6500 Å was found to be a good indicator of surface gravity. We find a general decrease in T_{eff} and $\log g$ as phase increases from 0 to 0.5, which is consistent with observed visual magnitudes.

105.05

Unidentified Binaries among Local F Stars

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A significant fraction of bright F stars within the evolved main sequence can actually be unidentified binaries with comparably bright components. We have tested the presence of such binaries using two independent approaches. First, we have compared absolute magnitudes obtained from HIPPARCOS parallaxes and TYCHO V_T magnitudes, M_{V_T} , with those derived from *uvby* photometry, M_{c_1} . For unresolved binaries, absolute magnitudes from HIPPARCOS must be brighter because they represent the integrated flux of a binary stars while the *uvby* absolute magnitude is determined by the integrated spectrum and is the same for a single star and a binary with two identical components. This test has shown that at a given effective temperature the difference $M_{V_T} - M_{c_1}$ gets increasingly brighter toward brighter M_{V_T} , indicating the increasing fraction of binaries as one moves upward from the ZAMS. The second test compares the age-velocity relations of the stars above and below the loci of the turnoffs in the $\log T_e - M_{V_T}$ diagram. The test has shown that the mean tangential velocities of the stars above the turnoff level are systematically larger, suggesting that many of these stars are in fact binaries with comparably bright components, with absolute magnitude of the primary much fainter than the observed M_{V_T} . The actual age of such stars is older than that derived from M_{V_T} , hence their velocities must be on average larger. The discrepancy between the age-velocity relations turns out to be much smaller if M_{c_1} is used instead of M_{V_T} , which additionally supports the first test: the result implies that the stars which are fainter in M_{c_1} are mostly the same stars which are responsible for larger discrepancy between the age-velocity relations when age is derived from isochrone fitting to M_{V_T} .