ABSTRACT

3.02
An Atlas of B-type Stellar Atmosphere Models with NonLTE Line Blanketing

L. S. Anderson (U. Toledo)

I present entries for an atlas of model stellar atmospheres in the temperature range 15,000 < T_eff < 30,000 K, and the gravity range 2.5 < log g < 4.5. These models are calculated using the multi-frequency/multi-gray algorithm (Anderson, 1987, in Numerical Radiative Transfer, edited by W. Kalkofen, Cambridge: Cambridge Univ. Press, p.163), and the model atom treatment described by Anderson (1989, Ap. J, in press). Nearly 1000 lines in the \textit{II,III,IV} spectra of C, N, O, Ne, Mg, Al, and Si, as well as \textit{II} and \textit{III} appear explicitly. Several million lines in the \textit{II,III} spectra of Sc-Ni are broadened with state-independent profiles and then sampled at intervals of approximately 100 Doppler widths. The code uses these sampled cross sections for the NonLTE solution of model-multiplet in a fictitious iron atom representing the ensemble of heavy ions. I compute emergent intensities sampled over the range 1 < \lambda < 54 \mu m, and detailed intensities in the neighborhood of specific features.

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3.03
Sodium Abundances in Nitrogen-Rich Subdwarfs

J. B. Laird (BGSU), G. S. Da Costa (Yale U.)

We present preliminary results of an investigation of sodium and aluminum abundances in four of the subdwarfs identified as having greatly enhanced nitrogen abundances relative to iron. In each case a comparison star of similar effective temperature and iron abundance has also been observed. Our results to date indicate that the nitrogen-rich subdwarfs have measurable stronger sodium D lines than their nitrogen-normal counterparts, while weak iron-peak lines show comparable strengths. These results, coupled with enhanced aluminum abundances reported by Magain, indicate that sodium and aluminum enhancements accompany the nitrogen enhancements in these stars, as is found for many globular cluster giants. There is clear evidence that these abundance anomalies in the subdwarfs are primordial rather than the result of internal mixing.

3.04
An Approximate Treatment of Radiative Transfer in Nonpherical Stellar Envelopes

L.R. Doherty (Univ. of Wisconsin-Madison)

Methods of solving the equation of radiative transfer in stellar envelopes with planar or spherical geometry are numerous and well known. These methods are, however, inadequate for extended envelopes and winds of stars that are rotating rapidly or are members of close binaries. Spang and Leung (1987) have considered the differential equation of transfer in cylindrical coordinates and developed a moment method based on variable Eddington factors to find the radiation field. Another possible approach is one using discrete ordinates developed much earlier (Carlson and Lathrop 1968) to deal with neutron transport problems in various geometries. Alternatively, we examine the properties of solutions obtained from solving the moment equation in general spherical coordinates for the number of rays in a rectangular grid superposed on a non spherical atmosphere. Angular integration uses the "natural" rays connecting the points of the cubic lattice and is