presence of large magnetic fields in some white dwarfs indicates the need for an investigation of the line spectrum which might be expected under such circumstances.

We have calculated the quadratic Zeeman effect in neutral helium for fields in the range $10^5$ to $1.5 \times 10^7$ gauss for the energy levels $1s2s$, $1s2p$, $1s2p$ to $1s3p$ and $1s3d$ to $1s7d$ for both singlets and triplets. The calculations included perturbations by other energy levels with $\Delta l = 0$ and $\Delta j \leq 2$ up to about $n = 10$. At $n = 5$ and a field of $10^7$ gauss the quadratic Zeeman shift becomes comparable to the energy difference between the $n = 5$ and $n = 6$ levels. We calculated the wavelengths and intensities of a large number of line components. A schematic model atmosphere of the Milne-Eddington type was then used to predict the appearance of helium lines in white dwarf stars having dipole magnetic fields with up to $1.5 \times 10^7$ gauss pole strength and arbitrary inclinations to the line of sight. These calculations were performed for lines of astrophysical interest in the visible region of the spectrum including $\lambda 5876$, $\lambda 4471$ and $\lambda 4343$. The $\Delta M = \pm 1$ components are considerably broadened by averaging the Zeeman effect over the stellar surface, and their central intensities weakened, while the $\Delta M = 0$ components are broadened and shifted by the quadratic effect.

We predict that at magnetic fields of $10^7$ gauss helium lines (especially those of low principal quantum numbers) should still be visible, and not completely washed out by the broadening. This work was supported in part by National Science Foundation Grant GP-30096.

07.06.05 Formation of Spectral Lines in Spherical Stellar Atmospheres. F. KUNASZ and D. G. HUMMER, Joint Institute for Laboratory Astrophysics. - Line formation in spherical atmospheres is much more complex than in plane-parallel media because an extra scale-length, the radius of curvature, is involved in addition to the thermalization length and the optical thickness. In order to elucidate the general behavior of the radiation field in the various domains defined by the relative magnitude of these three scale-lengths (and to develop practical techniques for these problems), we have investigated numerically the formation of spectral lines. Under non-LTE conditions in static extended spherical atmospheres. We have used the variable Eddington-factor method which was applied to spherical continuum problems by Hummer and Rybicki (1971 MN H52, 1). The first two moment equations (involving $J_0$, $K_0$ and $L_0$) for each frequency are reduced to one by introducing the so-called Eddington factors $f_\nu \equiv K_\nu/J_\nu$ and $g_\nu \equiv K_\nu/L_\nu$. When $g_\nu$ at the boundaries and $f_\nu(x)$ are specified the combined moment equations can be solved for $J_\nu$ and hence for the line source function (at present complete redistribution is assumed). From the formal solution of the transfer equation, $J_\nu$, $K_\nu$ and $K_\nu$ and hence $f_\nu$ and $g_\nu$ can be calculated if the source function is known. Iteration between these two sets of equations leads to very rapid convergence - four iterations gives better than 0.02% accuracy. In the present calculations the temperature, density and absorption coefficient can be arbitrary functions of radius. The extended atmosphere surrounds a core which can be either hollow or can absorb and emit radiation. The results of these calculations are interpreted to give insight into the line formation processes. These results will be summarized and various novel phenomena, such as the extremely rapid variation of the emergent line profile with angle, will be discussed.

07.07.05 The $^{12}\text{C}^{13}/\text{C}$ Ratio of the CH Stars in $\omega$ Centauri. R.A. Bell, Univ. of Maryland and R.J. Dickens, Royal Greenwich Observatory. Synthetic spectra calculations have been carried out for the wavelength regions of the Swan bands for the stars RGO 55 and RGO 70 in $\omega$ Cen. Comparison of calculation and observation confirms Dickens' (M.N.R.A.S. 139, 77, 1972) conclusion that the $^{12}\text{C}^{13}/\text{C}$ content is relatively high. We estimate a value of four for the $^{12}\text{C}^{13}/\text{C}$ ratio in both stars. Utsunomi Publ. Astr. Soc. Japan 19, 342, 1967) has suggested that the absorption at 4744 A in CH stars is due to the (7,0) band of the red system of CH and is not caused by the (1,0) band of $^{12}\text{C}^{13}/\text{C}$. This suggestion is not born out by our calculations.

7.8.5 Intrinsic Polarization of $\zeta$ Tauri. R. W. CAPPE, Kitt Peak National Observatory and Steward Observatory; G. V. CROHN, Lunar and Planetary Laboratory, University of Arizona; and H. M. DYCK, Kitt Peak National Observatory. - We have obtained new polarimetric observations of $\zeta$ Tauri from 0.33$\mu$ to 2.2$\mu$. A simple model has been developed which accounts for the observed wavelength dependence of polarization. The model requires the polarization to be produced in a thin disk by electron scattering with the wavelength dependent controlled by hydrogen free-bound and free-free radiation.

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08.01.07 Emission-Line Spectra of Supernova Remnants and Galaxies. D. E. OSTERBROCK, Washburn Obs. - Previously discussed photoelectrically-measured