ABSTRACTS


A new integral equation is derived relating the source function for a spectral line formed by non-coherent resonance scattering to the thermodynamic structure of the radiating medium. Numerical solutions are obtained by the introduction of discrete operations, with the resultant set of linear equations solved by matrix inversion. The solutions exhibit a remarkable degree of stability to a reduction in the number of discrete points in optical depth, and are particularly well suited for exhibiting the role of the various physical parameters and the detailed character of the source function as it approaches the condition of thermodynamic equilibrium. (Authors’ abstract.)

J. C. HENOUX


It is believed that because of the strong density gradient in the core and the large scale of stellar dimensions, an Ekman layer would not form in the sun. The slow meridional current distribution in a rapidly spinning core would be determined by the condition of energy balance. Fast circulatory currents in a thin shell of strong-velocity shear would be confined to the shell. The pattern of circulation would not be such as to pull the whole of the rapidly spinning core through this thin shell in a short time. In short, I believe that the Ekman pumping phenomenon does not occur in the sun. It is believed to be physically reasonable for the sun to have a rapidly rotating core, and such a core may be a source of a quadrupole moment that could account for the observed excess oblateness of the sun. (Abstract from author’s text.)

A. K. DUPREE


The authors present preliminary results of photographic photometry of new rocket spectra obtained on July 27, 1966. Absolute fluxes were derived by comparison of the wavelength region 1760–1860 Å with a calibrated tracing of March 1959. Equivalent black-body temperatures are given for four wavelength intervals between 1550 and 2080 Å. A radiative temperature of 4650 °K is found for the region λ 1550 to λ 1684 Å.

A. K. DUPREE


The vibration temperature for solar lines of the first overtone of carbon monoxide in the wavelength region 2.3–2.5μ and the kinetic temperature were determined on the basis of observational material obtained for the center of the solar disk with the vertical solar telescope of the Sternberg Astronomical Institute (Moscow).

The present work and a previous paper of M. Ch. Pande (Astron. Zh. USSR, 43, 1966, 708) show that \( T_{\text{kin}} = T_{\text{vib}} = T_{\text{rot/mean}} = 4850 \, ^\circ\text{K} \) within the limits of errors of measurements and the uncertainty of the turbulent velocity. Hence it may be concluded that in the region of origin of lines of the CO molecule the condition of local thermodynamical equilibrium is valid.

N. N. STEPANYAN

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