THEORY AND OBSERVATIONS OF ACCRETION DISC SPECTRA

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Theoretical continua ($3000 \leq \lambda(\text{Å}) \leq 20000$), UBV colours and Balmer absorption line profiles (Hα - Hδ) have been computed for the optically thick parts of steady-state accretion discs around white dwarfs as a function of mass flow rate, mass of white dwarf and inclination angle. The uncertainties due to disc z-structure and outer radius and viscosity are considered.

The theoretical results for continua and UBV colours are compared with the theoretical results of Schwarzenberg-Czerny and Różyczka (1977) and Herter et al. (1979) and with results obtained using black bodies instead of stellar atmospheres (e.g. Lynden-Bell 1969). Where models can be directly compared the quantitative agreement is good.

The results are also compared with UBV colours taken from the literature and with new spectroscopic line profile data of several dwarf novae in outburst and a UX UMa type (Warner 1976) star, CD-42° 14462. The overall agreement between theory and observation is good for the UBV colours and reasonable for the line profiles. In particular we note the following. (i) The models reported here span the region of the two-colour (U-B) - (B-V) diagram populated by dwarf novae in outburst and by the UX UMa stars. This is because of the inclusion in our calculations of "medium-temperature" discs by considering a variety of values of outer radius, mass flux rate and central mass. (ii) A detailed comparison of UBV colours and line profiles of the super-outburst with outburst states of dwarf novae suggests that the mass flux rate and outer disc radius increase in going from outburst to superoutburst. (iii) The general agreement of the theoretical disc line profiles and UBV colours with those observed in dwarf novae in outburst suggest that the disc is responsible for the observed broad hydrogen absorption lines and confirms that the disc indeed dominates the outburst spectrum.

Some of these results were given in an extended summary at IAU Colloquium 46 (Mayo et al. 1978) and full details will appear elsewhere (Mayo 1979, Mayo et al. 1979).

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