POLARIZATION MEASUREMENTS OF GALACTIC B[e]-STARS

B[e]-stars are characterized by strong Balmer emission-lines (frequently with P Cygni profiles), emission lines of Fe II, [Fe II], [O I], etc., and a strong IR-excess due to thermal radiation of circumstellar dust. Zickgraf et al. (1985, 1986) suggested a non-spherical model with a disk-like configuration for a subgroup of these stars, the B[e]-supergiants. Information about deviations from spherical symmetry can be obtained from polarization measurements. We thus measured the linear polarization of a sample of nine galactic B[e]-stars in the continuum (Johnson (U)BVI-filter) and in the H$_\alpha$ emission-line (interference filter, $\lambda_0 = 6553$ Å, $\Delta\lambda = 36$ Å). The observations were carried out on Calar Alto Observatory, Spain, in August 1986 using the photopolarimeter attached to the 1.23 m telescope. We compared the observed wavelength dependence of polarization with the Serkowski-law for the interstellar polarization component. In five stars of our sample we found significant differences and hence an intrinsic polarization component. In particular three of these stars show a significantly lower polarization in H$_\alpha$ than in the adjacent continuum (interpolated between V and I), resembling classical B[e]-stars, where scattering by free electrons is the generally accepted polarization mechanism.

REFERENCES


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MULTIDIMENSIONAL RADIATIVE TRANSFER IN STRATIFIED ATMOSPHERES:
RADIATIVE COOLING BY LTE AND NON-LTE SPECTRAL LINES

SUMMARY

The question of efficiency of radiative energy losses in spectral lines is addressed. In a semi-infinite atmosphere with constant temperature, the total radiative energy loss (integrated over all depths) in a spectral line without continuum is infinite, in both LTE and non-LTE. Thus, only local energy balances may be considered with such models. We give radiative cooling functions for various non-LTE parameters and structural lengths of a two-dimensional stratified atmosphere. At the surface, cooling is less efficient in non-LTE than in LTE. At large optical depths, both become equal and are non-negligible. In these layers horizontal transfer effects become important for the energy balance.

(A detailed paper has been submitted to Astronomy and Astrophysics)