

Spectrophotometric determination of T_{eff} 's for six Cepheids with $P < 4$ d

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The population I Cepheids with $1.8 < P < 7$ d are a non-homogeneous group in the sense that in this period range one can find fundamental, first overtone and double-mode pulsators. This implies that these three types of stars fall approximately in the same luminosity range. The knowledge of accurate physical parameters of these stars is therefore of paramount relevance in order to detect possible significant differences among different mode pulsators.

We have made spectrophotometric observations at La Silla Observatory of six Cepheids with $P < 4$ d (3 first-overtone and 3 fundamental mode pulsators). From a comparison with Kurucz's models of atmospheres (1979) we have derived their T_{eff} 's during the pulsational cycle. Due to the relevance of a correct estimate of the interstellar reddening in order to obtain accurate temperatures, we have independently determined the colour excesses of the studied objects by means of observations in the $uvby\beta$ system using the method proposed by Feltz and McNamara (1980).

The derived mean T_{eff} 's are 6350, 5850 and 6400 °K for AZ Cen, BB Cen and BG Cru respectively (first overtone pulsators), and 6050, 6100 and 6150 °K for EY Car, R TrA and UX Car respectively (fundamental mode pulsators).

These temperatures confirm the $\log T_{eff}$ vs. $(B - V)_0$ relationship derived by Teays and Smith (1986) and are in good agreement, for the 4 stars in common, with the temperatures obtained by Pel (1978) from Walraven photometry.

As a conclusion we can affirm on the basis of the data both of our stars and of those of the larger sample by Pel (1978) that fundamental, first-overtone and double mode pulsators coexist in the high temperature region of the instability strip, and that no segregation depending on the pulsation mode is apparent.

References:

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