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IS HD 23878 A MILD CP STAR?

In a systematic study of rotation and metallicity among early A stars, Conti (1965) suggested that HD 23878 (= HR 1181 = τ^7 Eri, A2V) might be an Am star or a mild CP star, according to its anomalous (low) ratio Sc II λ 4246/ Sr II λ 4215. To our knowledge, there have been no other spectroscopic studies of this star since then, so that its classification could not be secured. However, Heck (1977) observed the star photometrically and pointed out that, in his sample, it showed the largest discrepancy in the Strömgren index c_1 (0.058) with respect to the value given by Hauck and Mermilliod (1975). Heck and Manfroid (1980) were subsequently unable to definitely decide about the suspected photometric variability.

Yet HD 23878 had been used as a comparison star for the study of photometric variations in the Strömgren *uvby* system of the CP star HD 25267 (= τ^9 Eri). The data, which had been obtained during two runs at the ESO Danish 50 cm telescope in December 1975 (35 points) and November 1977 (44 points), were recently reanalysed (Manfroid et al., 1985). New careful reductions of the observations, using the PHOT2 algorithm (Manfroid and Heck, 1983) allowed to confirm the variability of HD 23878. Nevertheless, in view of its low amplitude (about 0.012 mag peak-to-peak in *u*, 0.008 in the three other colours) it was kept as a comparison by Manfroid et al., since the second comparison of HD 25267, HD 24587, was also variable.

We analysed the data with our programme of period determination based on least-squares fitting (Manfroid and Mathys, 1985). First, we traced the periodogram for each run separately and then for both together. A periodicity is obviously present and the most likely frequencies that we derive are:

$$f = 0.13945 \pm 0.00015 + n 0.00144 \text{ d}^{-1}.$$

The alias frequencies ($1 + f$) cannot be definitely ruled out but seem much less probable; furthermore, the low projected rotational velocity ($v \sin i = 30 \text{ km.s}^{-1}$, Uesugi and Fukuda, 1981) also favours the longer period. In spite of the very low amplitude, we believe that the variations that we observe are real, because the same frequency appears in all three periodograms. An-

other argument is that HD 24587 (for which HD 23878 was used as a comparison) is the only CP-like variable in Mathys et al.'s recent study (1985) for which the standard deviation of the least-squares fit is significantly larger than the estimated accuracy of the measurements.

In conclusion, HD 23878 appears to be a low amplitude variable with a period of about 7.17 d. As far as one can judge for such small variations, these seem to be similar to those of CP stars. A new spectroscopic study of this star would thus be very desirable in order to confirm Conti's suggestion that it is a mild CP star.

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