

## Photometry and frequency analysis of CP-stars HR 4330 and HD 192678

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The results of a period analysis of the photoelectric photometry of CP-stars HR 4330 and HD 192678 in intermediate band 472 nm and 526 nm filters are presented. For HR 4330, the earlier published periods 0,82 d and 16 min were not confirmed. Two new values,  $P=0,92834$  d of a semi-amplitude 4,6 mmag and  $P=58$  min were found. None of the periods published earlier for HD 192678 were found in our observations. A relatively fair agreement in both the filters for  $P=4,77$  d was found.

*Key words:* CP-stars, period analysis, HR 4330, HD 192678.

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### 1. Introduction

The CP-star HR 4330 (HD 96707, FO<sub>p</sub> Sr,  $m_v=6,04$ ) was observed by Winzer (1974) who found a photometric variability  $P=0,82$  d. No periodicity was indicated by Percy (1975), while Matthews and Wehlauf (1985) found a 16 min periodicity of a very low statistical significance in their B, V photometry.

The star HD 192678 (A4<sub>p</sub> Cr,  $m_v=9,2$ ) was found to have variable magnetic field (Glagolevski et al., 1982). Magnetic observations lead to two periods, 14 and 30d, while photometries indicate periods 360 d, 18 d (Glagolevski, 1986).

In this paper we present the results of the photometry performed at the Skalnaté Pleso Observatory with a 60 cm photoelectric telescope and their period analysis.

### 2. Observations and analysis

A pulse-counting photometry in two 19,5 nm half-width filters centred to the wavelengths of 472 nm and 526 nm was performed. The basic observational scheme was as follows: a three-hour run with the filters changing in a sequence (526-472-526) nm, each filter observation lasted for about an hour. The full three-hour sequence, however, could not be carried out each night. A 10 second integration was

used and 50 integrations of the variable star between 5 integrations of the comparison star and 2 integrations of the background were made.

Three methods of period-finding were used: 1) the Fourier transform technique according to Deeming (1975) with the algorithm by Kurtz (1985); 2) a phase dispersion minimization method according to Stellingwerf (1978), and 3) the method elaborated by Morbey (1978). Prior to the period searching, the original data were averaged over suitable time intervals and, in a case of short-periodicities searching, fitted with a 2nd order polynomial in each night.

### 3. Results

HR 4330: The observations were obtained in 15 nights during the 1984/85 and 1985/80 seasons. In the first step we searched for a possible rotational variability using one-hour averages. As the best value the period  $P=0,92834$  d of 4,6 mmag

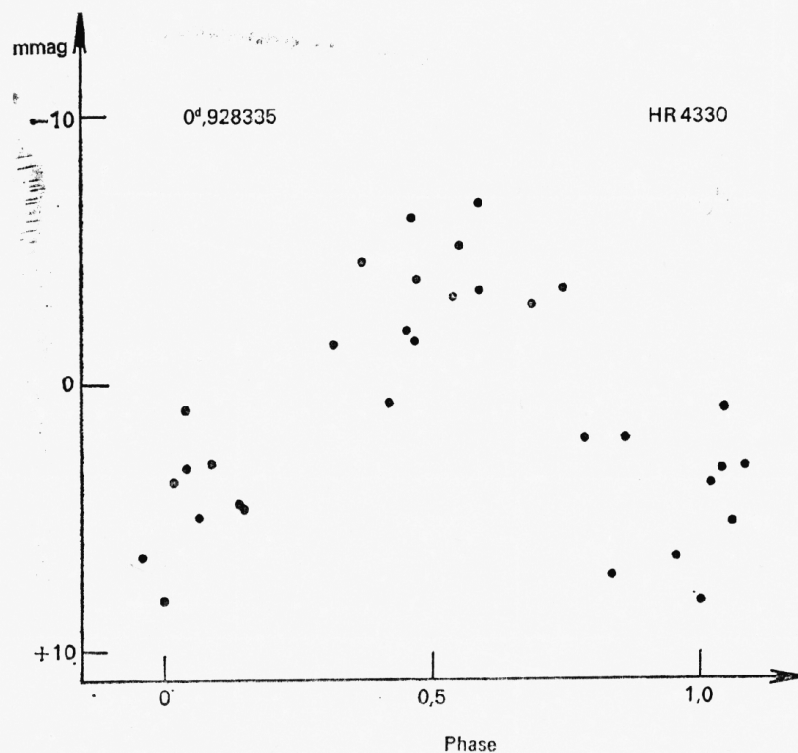


Fig. 1

semiamplitude was indicated (Fig. 1). Using 8 min averages short-period variations were searched. Periods between 57 and 63 min were indicated in the four longest individual nights. The common period for these four nights' data is  $P=58$  min (Fig. 2). No other significant variability was found in the interval 58-144 min. The same pays for the interval 10-58 min which was searched on one-minute averages.

HD 192678: This magnetic star was included in our observational programme in 1982. The majority of the material was obtained in the season from March 1983

to March 1984 when we observed the star in 16 nights. The period analysis was carried out on the one-hour averages. Several periods for each of the individual filters were found but only the value  $P=4,77$  d of 10 mmag semi-amplitude is common for both filters (Fig. 3). This period, however, needs further confirmation, as there are no observations in more successive nights obtained.

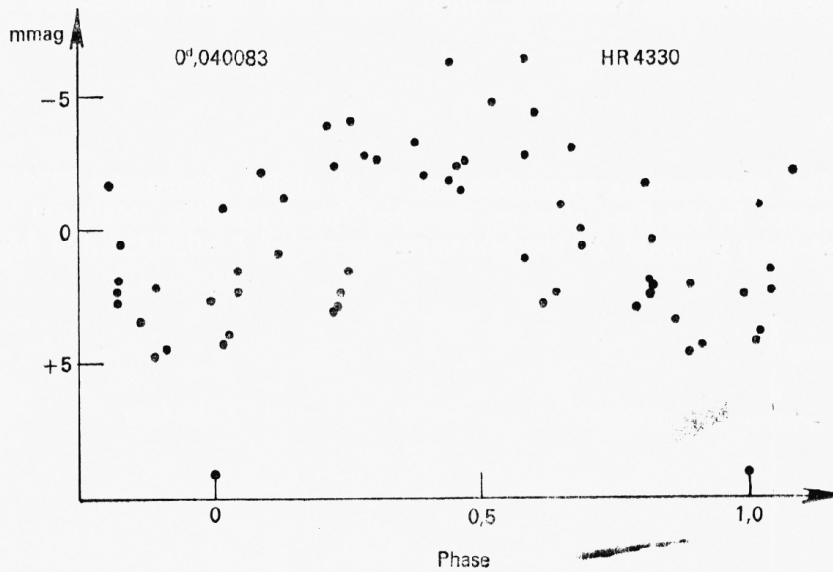


Fig. 2

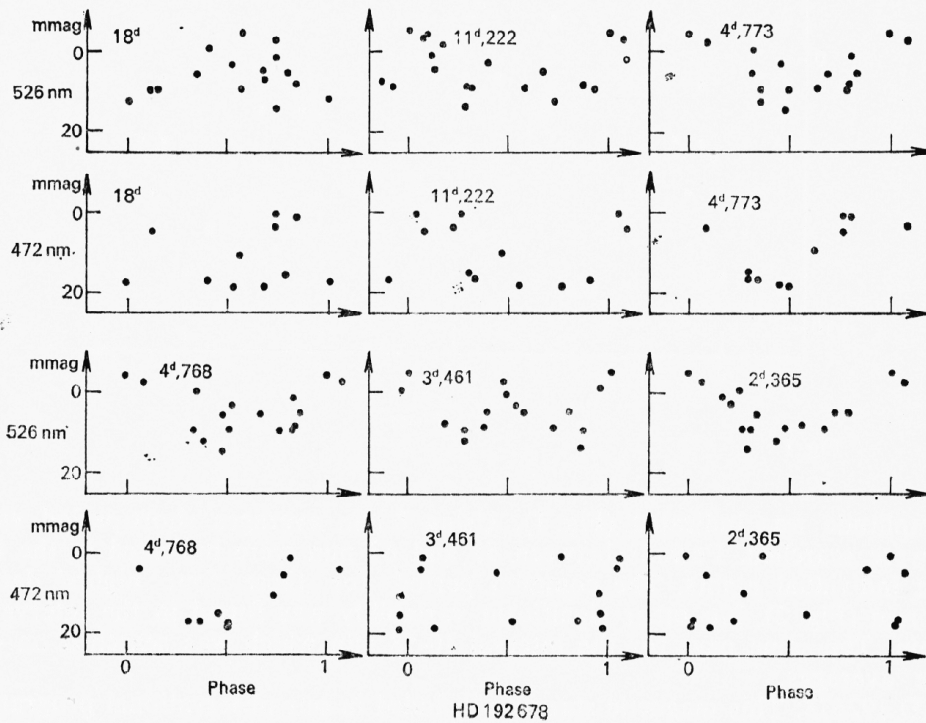


Fig. 3

## 4. Conclusions

A period analysis of the photometric observations of the magnetic star HD 192678 in intermediate-band filters 472 nm and 526 nm indicates a possible periodicity  $P=4,77$  d, which has to be confirmed. Those up to now known periods of 14, 18, 30 and 360 d were not found in our observations. The observations of a CP-star HR 4330 in the 526 nm filter indicate a period  $P=0,92834$  d and a possible short period variability of 58 min. None of the earlier published periods was confirmed.

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