

COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS

Number 2297

Konkoly Observatory
Budapest
1983 March 18
HU ISSN 0374-0676

ON THE CONSTANCY OF THE PERIOD OF THE MAGNETIC Ap STAR HD 215441

Rakosch (1968) suggested variable periods for some Ap stars. From the point of view of the interpretation of the light variability of magnetic Ap stars as an effect of rotation it is an important question whether the period is constant or not. Therefore many authors investigated this problem. In the course of time it becomes more and more clear that all observations can be explained with constant periods.

Only HD 215441 remains, for which Rakosch (1968) and later Stift (1973) discussed a variable period. Renson (1972) could not find any change in the period of this star, but Panov and Schöneich (1975) showed that, at some epochs, small changes could not be excluded. All these investigations, carried out with O-C-diagrams, use a small number of observations around the extreme values of the light curves only. The accuracy of the obtained phases will be higher if all points of the light curve are used.

Hempelmann and Schöneich (in preparation) developed a method for the determination of the brightness distribution over the star's surface from the light curve. This method permits also derivation of the phase angle θ , at which the centre of the peculiar region passes by the line of sight. It has to be underlined that, among all parameters, θ can be obtained with the highest degree of accuracy and is especially for a star like HD 215441 with a single peculiar region, independent from the accuracy of other parameters.

We investigated the wavelength dependence of θ . The values of θ were computed for the light curves of the ten colour photometry by Schöneich et al. (1976) and the UV photometry by Leckrone (1974), provided that the observations are carried out at nearly the same time. Figure 1, presenting θ as a function of the wavelength, shows a constancy of θ in the range greater than 200 nm. For this reason one can compare the light curves from all other authors in different colours.

For all available observations by Jarzebowski (1960), Cameron (1966), Stepien (1968), Schöneich et al. (1976), Leckrone (1974), Hildebrandt et al. (in preparation) and Panov (private communication) the angle θ was computed

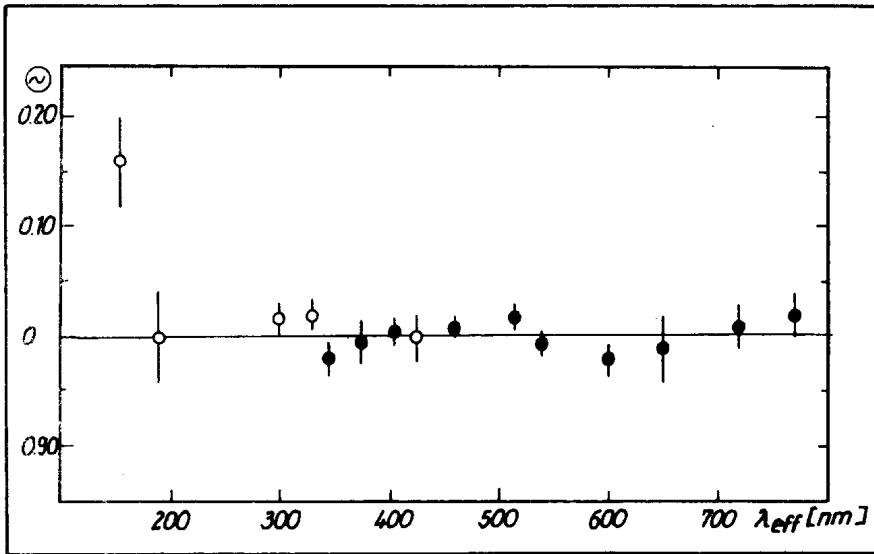


Figure 1

The wavelength dependence of the phase angle θ . Open circles denote θ from measurements by Leckrone (1974), filled circles are for the ten-colour-photometry

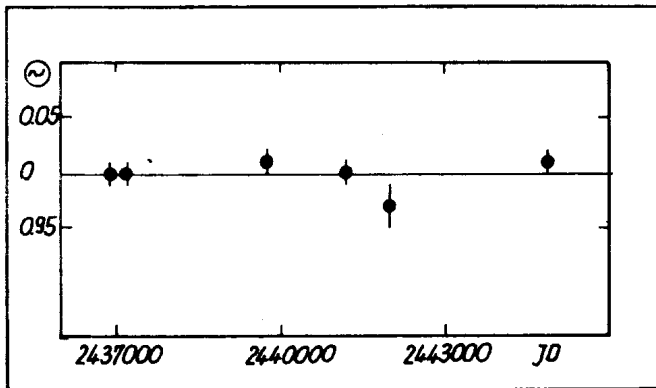


Figure 2

The time dependence of θ .

with the elements by Panov (private communication).

$$JD_0 = 2441902.49 + 9.4875 E$$

Figure 2 presents the computed Θ as a function of time. There is no significant difference of a single Θ from the averaged ones and therefore we conclude that in the last 22 years there has been no observational evidence for any change in the period of HD 215441.

A. HEMPELMANN, W. SCHÖNEICH
 Zentralinstitut für Astrophysik
 Astrophysikalisches Observatorium Potsdam
 DDR-1500 Potsdam
 Telegrafenberg

References:

- Cameron, R.C. (1966), Georgetown Obs. Monograph No. 21
 Jarzebowski, T. (1960), Acta Astronomica 10, 119
 Leckrone, D.S. (1974), Astrophys. J. 190, 319
 Panov, K., Schöneich, W. (1975), Magnetic Ap Stars, Baku 1975, p.16.
 Rakosch, K.D. (1968), Astronom. J. 73, 114
 Renson, P. (1972), Astron. and Astrophys. 18, 159
 Schöneich, W., Hildebrandt, G., Fürtig, W. (1976), Astron. Nachr. 297, 39
 Stepien, K. (1968), Contrib. Lick Obs. No. 267
 Stift, M.J. (1973), Astron. and Astrophys. 22, 209