

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

Number 1970

Konkoly Observatory
Budapest
1981 May 25
HU ISSN 0374-0676

HD 114842, A NEW SHORT PERIOD VARIABLE STAR

During a search for the periodic content of the Delta Scuti star HR 5005 we had to choose an extra comparison star from those previously considered by Jerzykiewicz (1975). He took HR 5014 and HR 5059 as standard stars but concluded that HR 5014 was most likely a variable itself. With this conclusion in mind, a third standard star had to be considered. Following the criteria for choosing the comparison stars, as stated in Baglin et al. (1973) or in Warman et al., (1974), this would have to be close to our problem star, ($\leq 2^\circ$), of about the same magnitude as the variable (6.5 for HR 5005) and approximately of the same spectral type. Since one third of the stars that lie within the instability strip are variable (Breger, 1979) we chose an F8 (HD 114842) that should be outside these limits.

On analyzing the light curves of all our observed stars, one can conclude that the original consideration of Jerzykiewicz can be attributed to a different air mass extinction since these two standard stars are more than 9 minutes apart. Our analysis showed that the light curve of these two stars behave similarly on all nights although, on revising the literature it was found that HR 5014 is reported as a double star in the Bright Star Catalogue and by Jeffers et al. (1963) in the Index Catalogue of Visual Double Stars, where it is reported that this star

was observed in 1959 by Finsen who established it as a double system and determined a separation of $0''.1$, an angle of inclination of $27''$, and also that both components are of the same brightness, 7.1 mag. No further information of this system has been available to us, so we cannot conclude if the slight difference observed is due to the binarity. But due to the fact that it has been reported as double, it cannot be taken as a standard in the present study and was just taken as a check star for the atmospheric conditions.

The equipment utilized was the 60-inch telescope at the San Pedro Mártir Observatory, México. An 1P21 cooled detector and Johnson's V filter were employed. For each reported point of the differential photometry, six ten-second integrations were obtained; to the average of this flux a ten-second integration of the sky was subtracted and the magnitude was obtained by means of the familiar relation $m = -2.5 \log F$. Our data point are accurate to 0.004 mag; the average time span between successive reported points is of about eleven minutes and the accuracy in time is of 2 minutes.

The results are presented in Figure 1. The amplitude is of about 0.035 mag, but the period, determined from peak to peak, is rather irregular, suggesting the presence of several simultaneous modes of pulsation; the shortest is of about 0.056 d, whereas the largest indicates a figure closer to 0.191 d. The average period is of 0.095 d. Its spectral type is rather late, an F8; nevertheless, due to the characteristics shown, (short period of the order of hours, low amplitude variation and an F spectral type) one might conclude that, more likely, this is a Delta Scuti Pulsator.

Breger, (1979) in his recent review article does not list another star as late as this one. Of course, the possibility that it lies outside the instability border exists, but another more likely possibility is that its spectral type is inaccurately determined. Peña et al. (1981) have shown that, in general, the spectral types of the Delta Scuti stars are not very accurately determined. We encourage the obtention of spectra of this star to fix its position univocally in both the PLCR and the HR diagrams and establish its pulsational nature.

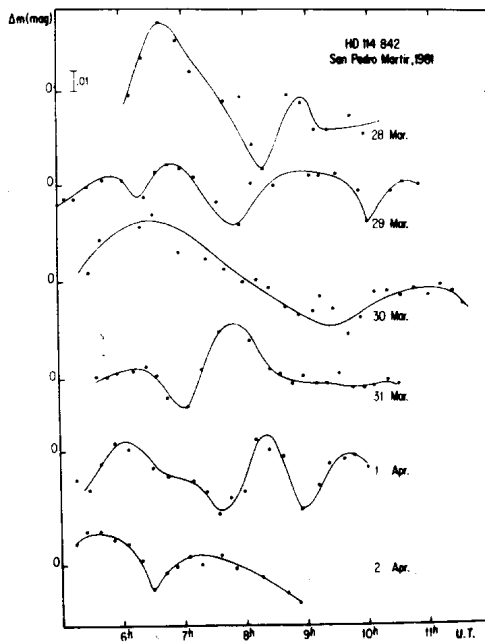


Figure 1

R. PENICHE, J. H. PEÑA

Instituto de Astronomía

Universidad Nacional Autónoma de México

References:

- Baglin, A., Breger, M., Chevalier, C., Hauck, B., le Contel, J. M., Sareyan, J. P., and Valtier, J. C. 1973, *Astron. and Astrophys.* 23, 221.
- Breger, M. 1979, *Publ. Astron. Soc. of Pac.*, 91, 5.
- Jeffers, H. M., Van den Bos, W. H., Grebby, F. M., 1963, *Publ. of Lick Observ. Vol. XXI*, parts I, II.
- Jerzykiewicz, M., 1975, *Publ. Astron. Soc. of Pac.*, 87, 817.
- Peña, J. H., Peniche, R. and Warman, J. 1981, to be published in the April issue of *The Publ. Astron. Soc. of Pac.*
- Warman, J., Malacara, Z, and Breger, M. 1974, *Rev. Mexicana Astr. and Astrof.*, 1,143.