

COMMISSION 27 OF THE I. A. U.  
INFORMATION BULLETIN ON VARIABLE STARS  
Number 1584

Konkoly Observatory  
Budapest  
1979 April 13

HR 5343 A NEW DELTA SCUTI TYPE VARIABLE

The star HR 5343 ( $m_v = 5.28$ ) has been found variable when it was used as a comparison star in the photometric observations of the Am star 22 Boo ( $m_v = 5.27$ ). The study of 22 Boo is part of a largest program whose aim is to check the constancy of evolved Am star and whose results will be published elsewhere (Garrido et al. 1979).

The star HR 5343 that we reported here as variable was found constant by Breger (1969) inside a limit of 0.002 mag when he observed it during 2.7 and 2.4 hours in two different nights.

Observations

Observations have been performed during summer 1978 in a photometric station at 2609 m of altitude in Sierra Nevada (Spain). The observing equipment consisting in a 30 cm Cassegrain telescope, a photoelectric photometer equipped with an unrefrigerated EMI 6256 A photomultiplier and an analogical recorder. Only one filter, close to the B of the Johnson's system has been used.

The star has been observed during three nights. The magnitude differences HR 5343-22 Boo are shown in Figure 1. The figure also includes a plot of the magnitude differences between 22 Boo and the second comparison star HR 5346 ( $m_v = 6.30$ , dF4) as a monitoring of the measurement accuracy. The amplitude of the light variations is about 0.03 mag. and does not change significantly from one night to another.

A period estimation has been obtained from a night by night Fourier analysis of the data. We found periods slightly different for each night with a mean value of 0.04 d.

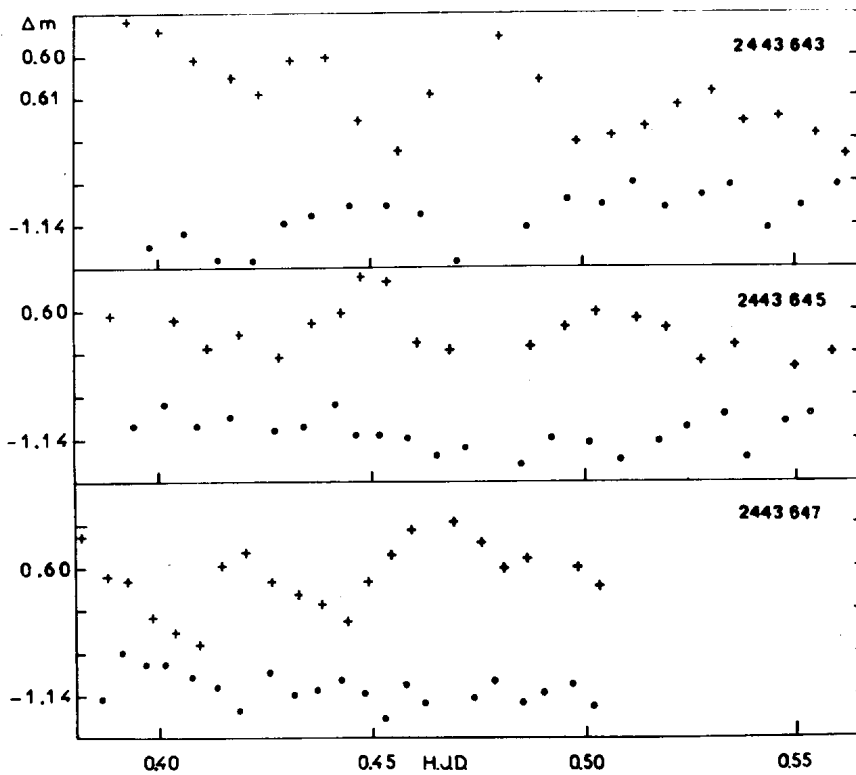


Fig.1 - Light curves showing the magnitude difference HR 5343 - 22 Boo (crosses) and 22 Boo - HR 5346 (points) versus the heliocentric Julian date. The number which appears in the corner of each light curve is the Julian day of the observation.

#### Spectral Classification

A photometric calibration of HR 5343 (Philip et al. 1976) gives  $M_v = 2.54$  and  $\log T_e = 3.88$  which places this star in the extension of the cepheid instability strip close to the main sequence. The period and luminosity found are in agreement with the period-luminosity-color relation for  $\delta$  Scuti stars,  $M_v = -3.052 \log P + 8.456 (b - y)_0 - 3.121 (\pm 0.31 \text{ mag})$  (Breger, 1979) which gives  $M_v = 2.58$ .

Its classification as Am in the Bright Star Catalogue (Hoffleit, 1964) would indicate that this star contradicts the well established fact

that main sequence Am stars do not pulsate. However, another spectral classification by Bertaud and Floquet (1967) shows that HR 5343 is a normal FO IV star having  $M_V I(\lambda 4031 - 34)$  and  $Ca I (\lambda 4227)$  lines weaker than usual. So the classification as Am is probably wrong.

#### Conclusion

The position of this star in the HR diagram, the value of the period and the shape of the light curves suggest its classification as  $\delta$  Scuti variable. The value of the pulsational constant,  $Q = 0.025$ , obtained from  $\log Q = -6.454 + \log P + 0.5 \log g + 0.1 M_{bol} + \log T_e$  (Petersen and Jorgensen, 1972), corresponds to a pulsation in the first overtone.

V. COSTA  
R. GARRIDO  
M. SAEZ  
Instituto de Astrofisica  
de Andalucia  
Apdo. 2144  
Granada  
Spain

#### References:

- Bertaud, C. and Floquet, M. 1967, J. Obs. 50, 425.
- Breger, M. 1969, Astrophys. J., Suppl. Ser. 19, 79.
- Breger, M. 1979, preprint.
- Garrido, R., Costa, V., Lopez de Coca, P. 1979, preprint.
- Hoffleit, 1964, Catalogue of Bright Stars, 3 ed. (New Haven Yale University press).
- Petersen, J.O. and Jorgensen, H.E. 1972, Astron. Astrophys. 17, 367.
- Philip, A.G.D., Miller, T.M. and Relyea, L.J. 1976, Dudley Obs. Rep. n° 12.