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RS Cha : A DELTA SCUTI VARIABLE

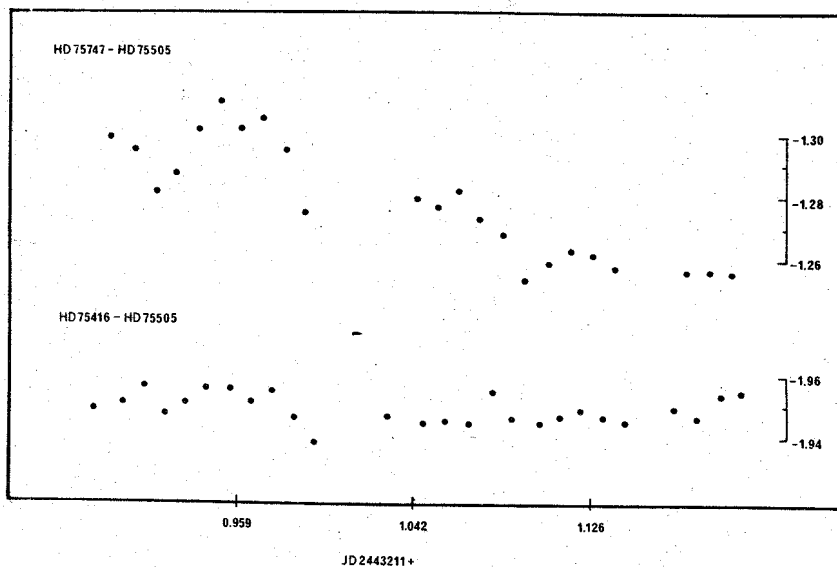
Because of its spectral type, RS Cha (=HR 3524=HD 75747) was observed as part of a programme being carried out at Mount John University Observatory to detect new δ Scuti type variables. It has been found to show light variations of variable amplitude.

The star was observed on 9th March, 1977 in the B and V bands of the UBV system with the 61 cm telescope of the University of Pennsylvania at Mount John University Observatory. A thermoelectrically cooled EMI 6094B photomultiplier tube was used for the observations, each observation consisting of four 10 second integrations. Extinction was determined from the comparison stars and the observations were reduced to the UBV system. The comparison stars used were HD 75416 and HD 75505.

Observations obtained in the B filter on the 9th March are shown in the diagram. The magnitude differences for the comparison stars are also shown for comparison, their mean scatter being 0.004 magnitudes.

RS Chamaeleontis was discovered to be an eclipsing variable by Strohmeier (1964). Andersen (1975) has determined the various elements and physical parameters for this system and believes the secondary to be an Am star.

The lights variations exhibited by RS Cha show that it is also an intrinsic variable, but the limited number of observations obtained on the 9th March have prevented an accurate determination of the period. From variations in the B and V filters we can only conclude that the dominant period lies between 0.074 and 0.097 days. Present observations are insufficient to resolve which component is pulsating or whether both are.



Magnitude differences for RS Cha (HD 75747) and comparison stars in B filter.

If the secondary is in fact a classical Am star then it is unlikely to show pulsational instability, (Breger, 1970). If it is assumed that only the primary is pulsating and it is a δ Scuti star, then by using the physical parameters of Andersen and the P-L-C relationship for δ Scuti stars, (Breger and Bregman, 1975) we find $P_0 = 0.070$ days. On the other hand, using the P-L relationship of Dworak and Zieba (1975) for faint δ Scuti stars we obtain $P_0 = 0.078$ days. Because of the uncertainties involved in the above relationships, these results are in reasonable agreement with the observed period range.

For the period range in question the observed pulsation constant Q agrees with the theoretical value of $Q_0 = 0.0335$ days given for the δ Scuti models above the main-sequence, (Jorgensen and Petersen, 1974). Applying the period-mean density relationship with $Q_0 = 0.0335$ days to the primary, a fundamental period of 0.077 ± 0.006 days is obtained. This is in good agreement with the results of the empirical P-L and P-L-C relationships.

The observed light variations of small amplitude and period, together with the good agreement of the physical parameters of the components with mean δ Scuti properties, (Baglin et al., 1973), do indeed suggest that at least one component in this system is a δ Scuti star.

Further observations are planned in order to obtain a more accurate period, to resolve which component is pulsating or whether both are, and to determine whether non-radial pulsations are evident, (Fitch, 1975).

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References:

- Andersen, J., 1975, *Astron. Astrophys.*, 44, 445
Baglin, et al., 1973, *Astron. Astrophys.*, 23, 221
Breger, M., 1970, *Ap.J.*, 162, 597
Breger, M., and Bregman, J.N., 1975, *Ap.J.*, 200, 343
Dworak, T.Z., and Zieba, S., 1975, *IBVS*, No. 1005
Fitch, W.S., 1975, in *Multiple Periodic Variable Stars*
IAU Colloquium No. 29 (Budapest), 167
Jorgensen, H.E., and Petersen, J.O., *Astron. Astrophys.* 35, 215
Strohmeier, W., 1964, *IBVS*, No. 55