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MULTIPLE PERIODS IN 15 CANIS MAIORIS

According to C.R. Lynds, J. Sahade and O.Struve (Ap.J., 124,321 p, 1956) the radial velocity variation of 15 CMa obeys a main period of $0^d.184558$ (2K = 6.5 km/sec). Their computed mean RV curve reveals, however, in a striking manner the existence of a secondary period of exactly half that length and with a corresponding amplitude of 2.5 km/sec.

Such an exact 2:1 ratio has been found to exist between the periods $P_{1,3}$ and P_2 (s. foot-note+) in each of the stars Nu Eri (1) and Beta Cep (2), which are the immediate neighbours of 15 CMa when the Beta CMa stars are listed according to period length. Taking into account the similarity in behaviour of the group members, the two periods discovered by Lynds et al. must be considered as the star's $P_{1,3}$ and P_2 respectively.

Postulating further that the ratios

$$P_{1,3} = 1.01 \times P_o \; ; \; P_1 = 0.675 \times P_o \; ; \; P_2 = 0.505 \times P_o \text{ etc.}$$

+ The symbol P_i is used to denote the free pulsation in the fundamental mode (i=o), the first overtone (i=1), the second overtone (i=2) etc., while the symbol $P_{i,j}$ denotes the difference oscillation between P_i and P_j.

(1) A. van Hoof, Zeitschr. f. Astroph., 53,106 S., 1961
(2) id. ibid. (in press)

found in both Nu Eri and Beta Cep hold also good for the present star, we are able to compute the various other periods that must be expected in 15 CMa. In this manner we found:

P_o = o.^{d}182586	(6.o km/sec)	$P_{o,2}$ = o.^{d}186663	(5.3 km/sec)
P_1 = .123154	(2.5 ")	$P_{1,3}$ = .184558	(6.5 ")
P_2 = .o92279	(2.o ")	$P_{2,4}$ = .182586 = P_o	
P_3 = .o746o6	(o.3 ")		
P_4 = .o62o115	(1.5 ")		

The amplitudes added are those of the mean curves computed from Lynds' Sahade's and Struve's observations for each of the periods listed.

It should be stressed, however, that this material is quite inadequate for the determination of the amplitudes of the longer periods $P_o, P_{1,3}$ etc. This material has been collected in three groups of three consecutive nights and the mean epochs of these groups are separated by intervals which by accident correspond roughly to an integer number of each of the periods $P_o, P_{o,2}$ and $P_{1,3}$, so that the phase relation of these three oscillations is practically the same in the three series of nights. Consequently the mean RV curves computed with these three periods must practically have the same amplitude, which is simply the resultant amplitude of the superposition in a particular phase relation of the three component curves, the amplitudes of which remain unknown.

It is further obvious that the scantiness of the observations does not permit the accurate determination of any period or amplitude.

With this restriction in mind we want newertheless to mention the weakness of the oscillation P_3. The same weakness was noticed earlier in Nu Eri and in Beta Cep.

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