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SOME COMMENTS ON AB Cas

AB Cas is one of the very interesting eclipsing systems known to-day to have pulsating components. P. Tempesti (I.B.V.S.No. 596, 1971) announced for the first time the bright component of AB Cas to be a Delta Scuti star using many photoelectric observations.

This star was observed photoelectrically at Gissar station of the Astrophysical Institute in Dushanbe during two nights in October, 1976 using the 70 cm reflector. The observations confirm the existence of a pulsating variable of Delta Scuti type as the bright component, showing pulsations in the secondary minimum (during the second night). The light amplitude in V band of the UBV system and approximately the period of pulsations are the same as P. Tempesti has found.

Carefully analysing the mean light curve of AB Cas in V band shown in I.B.V.S., No. 596, 1971 we arrived at the following logical conclusion (unfortunately the present observations are very few and are distributed during too short time interval).

P. Tempesti has plotted all his observations during the years 1967-1971 according to phases of the eclipsing binarity (Orbital period is roughly equal to 1.3 days). If the pulsation period (0.058^d roughly) would not be strictly equal to P_{orb}/N (N is a whole number), then we could not see any separated pulsation cycles on the mean eclipsing curve of AB Cas. Indeed, on the time basis of Tempesti's observations, containing roughly 25000 pulsation cycles, even such a small value of the deviation $\delta = |P_{\text{puls}} - P_{\text{orb}}/N|$ as about 10^{-6} days leads to the error in pulsation phases equal roughly to half of the value of the pulsation period. If so, we shall see on every orbital phase only

occasional (from minimum to maximum) values of magnitude of intrinsic light variability instead of more or less clearly separated pulsation cycles as P. Tempesti has shown in his paper.

From this we can conclude that in the case of AB Cas the strict synchronization of the pulsation period (and the beat one, if it is present) with the orbital period must exist. If so, in the case of beat phenomenon in this Delta Scuti star the mean length of the main pulsation period and the value of beat period must be extremely constant.

Now one of us (M.S.F.) discovered the same effect in Y Cam. Both pulsation periods (P_0 and P_{beat}) are indeed synchronized (in the same sense) with the orbital one. The paper on Y Cam will be published in complete form somewhat later.

The synchronization (in both cases) of pulsation periods with the orbital one means the synchronization with the rotation period of the Delta Scuti component, if the rule of equality of P_{orb} and P_{rot} is fulfilled in these binary systems. So, it probably indicates a non-radial pulsation of Delta Scuti stars.

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B.N. IRKAEV
O.A. CHEKANIKHINA
Dushanbe Astrophysical
Institute of Tadjik Academy
of Sciences, U.S.S.R.

M.S. FROLOV
Astronomical Council
of the USSR Academy
of Sciences
U.S.S.R.