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ON THREE CEPHEIDS IN M 33

Hubble (1926) suggested that variables Nos. 14, 15, 21, 32 and 45 were of Cepheid type but he did not find any periods. Recently Sharov and Kholopov (1983) determined the periods of four of these stars using Hubble's observations.

From eight plates of M 33 obtained by the 2 m RC telescope of the Bulgarian Academy of Sciences we evaluated B magnitudes of four stars (Table I).

Table I
 Magnitudes of Variable Stars in B system

J.D.	14	15	32	45
2440000				
4528.55	20.5	21.1	21.8	20.4
5283.34	21.0	21.1	20.95	20.2
5295.44	20.9	-	21.8	-
5296.48	20.94	21.6	21.8	20.7
5297.45	20.7	22.0	21.6	20.9
5348.38	20.7	22.0	21.65	19.85
5622.40	21.3	-	20.64	-
5624.39	20.95	-	20.95	20.9

We used the new magnitude scale of Sandage (1983). The new periods and light curve parameters are given in Table II.

Table II
 Light-curve Parameters of Variable Stars

Star	B^{\max}	B^{\min}	$\langle B \rangle$	$\langle B \rangle_{PL}$	Period	Epoch of max J.D. 2420000
14	20.8	21.9	21.4	20.2	46.315	4382.2
15	21.1	21.9	21.7	20.1	50.546	4108.2
21	20.1	20.7	20.5	20.0	67.22	-
32	20.5	22.1	21.5	21.2	19.99246	4148.093
45	19.9	21.0	20.5	19.9	78.88985	4405.364

The mean light curves of variables Nos. 32 and 45 show rapid brightening and slower fading (Figure 1). The $\langle B \rangle_{PL}$ magnitudes obtained through the period-luminosity relation for Cepheids and the distance modulus $m - M = 25.35$ (Sandage, 1983) are near the observed $\langle B \rangle$ magnitudes (Table II). The values

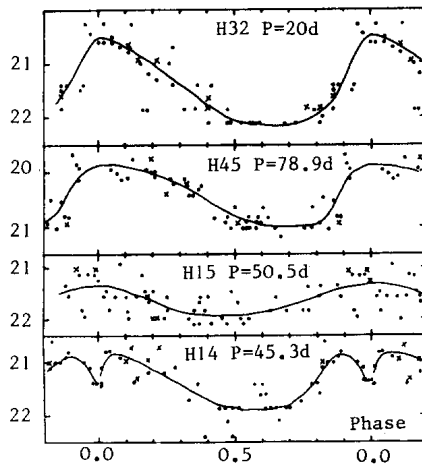


Figure 1

Light curves of variable stars. Hubble's observations are given by dots and our observations are denoted by crosses.

of the periods, amplitudes, $\langle B \rangle$ magnitudes and asymmetry of the light curves of variables Nos. 32 and 45 are typical for the Cepheids.

The variable No. 21 is near the nucleus of M 33. Hence the strong background does not permit reliable photometry. The sinusoidal light curve and the small amplitude of No. 21 obtained by Hubble's observations are similar to the s-Cepheid variables. Its $\langle B \rangle$ magnitude does not contradict to the Cepheid type luminosity.

The variables Nos. 14 and 15 are not Cepheids. The variable No. 15 has a period of 50.546 which well represents our and Hubble's observations. Our data, however, do not confirm the period of variable No. 14 obtained by Hubble's observations. Probably this star has an unstable light curve or period. The observational data are insufficient for the determination of the type of variability but the mean light curve reminds of an RV Tau variable.

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