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ON THE VARIABLE STAR *CΠ*3 1284 IN M67

The note by four authors (1) attracted anew our attention to the variable stars in M67 (2,3). The stars CΠ 3 1283 and CΠ 3 1284 have been again investigated on 50 plates obtained with the 16-inch astrograph of the Sternberg Astronomical State Institute (JD 2434059.37 -2437699.33). 54 exposures of M67 were made on two days (JD 2437377.25-2437378.43) on 4 plates. It has permitted to derive the elements of variable CΠ3 1284:

Min I hel = $2437378.322 + 0^{d}.3604364 \cdot E$,

Max I = $13^{m}.82$; Max II = $13^{m}.80$; Min I = $14^{m}.24$; Min II = $14^{m}.23$ pg.

The mean light curve is shown in fig.1. Each point is equivalent to 5 observations. Thus, the classification of the star CΠ 3 1284 belonging to the W UMa type, according to (1), is confirmed.

An attempt was made to compute a model of the system of this double star. If the modulus of M67 is $m-M=9^m.38$ (4) and the physical properties of the components are identical, then we have $m_{max}=14^m.57$ pg, $m_{max}=13^m.97$ pv for the magnitudes of each component, and $T_e=6000^o$, $IPg-IPv=+0^m.60$, $BC = 0^m.05$ for the stars of spectral class GO (5). Using the formula $M_{bol}=96.57-10\log T_e - 5 \log R$ (6), the following radii of the components were obtained: $R_{1,2}=0.773 \cdot 10^6 km=1.112 R_\odot$. Hence if the mass is proportinal to R^3, then $\mathfrak{M}_{1,2}=1.374 \mathfrak{M}_\odot$. According to Kepler's law we can compute now the radius of the relative circular orbits: $a_o=2.078 \cdot 10^6$ km, or $R_{1,2}=0.377 a_o$.

The dimensions of the components are probable such that they fill or nearly fill the innermost contact surfaces of Roche's model (7). The radius of the star perpendicular to the plane of the orbit should be in this case equal to $y_{12}=0.374 a_0$.

The intensity of the light in the minimum I is 0.679 of the total intensity of the components. This corresponde to the inclination $i_o \simeq 64^o$ between the plane of orbit and the visual plane (the tidal form of the components were taken into account graphically).

It is interesting that the period is constant over the interval of about 3640^d, or $\sim$ 10000P. It can be considered as the evidence of rather high stability of this close binary system.

The amplitude of the light variation of the second variable star in M67, CЩ3 1283, is so small, that its investigation seems to be practically impossible by photographic methods.

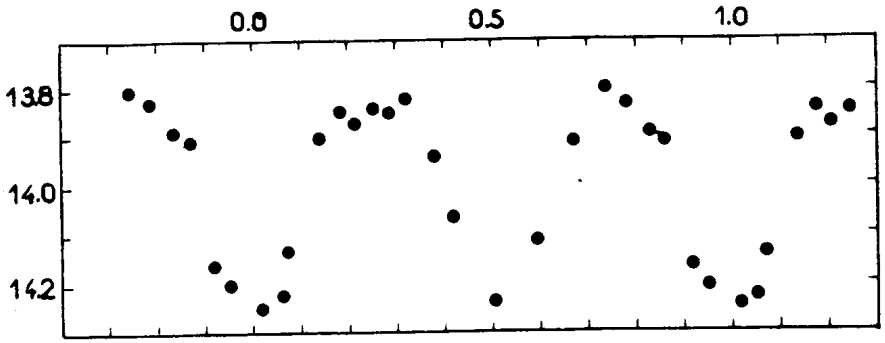

Fig1. CW3 1284 P = 0^d.36

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