

COMMISSION 27 OF THE I. A. U.  
INFORMATION BULLETIN ON VARIABLE STARS

NUMBER 392

Konkoly Observatory  
Budapest  
1969 October 17

A SPECTROSCOPIC STUDY OF THE ECLIPSING BINARY  
R CANIS MAJORIS

It is well known that the main feature of this close binary system is that both components have too small masses compared with those expected from their luminosities or spectral types; it is also well known that the period has abruptly shortened around 1914 and it is still shortening. The results obtained from former observations do not agree well and there is no reason to prefer any one of the available orbits.

Spectroscopic observations of this binary has been done at the Observatory of Merate by the writer from January 1966 at a dispersion of 34 Å/mm, and a new set of elements has been derived from 17 plates without undertaking a least squares solution. The results are the following ones:

$$\begin{array}{ll} K = 26.0 & a \text{ seni} = 0.406 \cdot 10^6 \\ V_0 = -45.5 & f(m) = 0.0021 \end{array}$$

eccentricity assumed = 0.00. A new orbit has also been computed from all the 81 observations available, covering about 40 years, from the year of the sudden change of the period, by means of the programme by Bertiau. The results are:

$$\begin{array}{ll} K = 25.07 \pm 2.61 & P = 1.1359 \pm 0.0015 \\ V_0 = -39.80 \pm 2.20 & T_0 = 2432891.510 \pm 0.018 \\ e = 0.046 \pm 0.104 & f(m) = 0.0020 \\ \omega = 149^\circ 77' \pm 1.85 & a \text{ seni} = 0.391 \cdot 10^6 \end{array}$$

From the mass function computed in this way and assuming (Kitamura) for the primary component a normal F1 V mass of  $1.7 \odot$ , we deduced a mass ratio of 0.12; in this case the radius of the secondary component exceeds its Roche limit. If on the contrary, we assume that the secondary fills exactly its Roche limit, we deduce a total mass of only 0.31 with a mass ratio of 0.24. We may confirm in this way the result by Kitamura of a mass loss through the Lagrangian point  $L_2$ .

Finally we notice that the velocity  $V_0$  of the center of mass has diminished in a way that may be an evidence of the existence of a third body with very long secondary period.

Osservatorio Astronomico di Brera-Milano

P. GALEOTTI

References:

Bertiau, I.A.U., Symp. n.30, p.227

Kitamura, Astrophys. and Space Science, 3, 163, 1969