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ON THE STABILITY OF THE PERIOD OF BO CEPHEI

For several decennia BO Cep has been regarded as the prototype of irregular variable stars which show Algol-like, but unperiodic, sharp fadings of their brightness. Frequently the star was mentioned in the same breath together with the extremely young stars of T Orionis type, but its evolutionary state has never been firmly demonstrated.

Recently Grankin et al. (1991) showed that in their photoelectric brightness data of the "normal light" of BO Cep a period of about 10 days was hidden, and they constructed good-looking mean lightcurves for the four years 1987 to 1990 of their measurements.

Our own photoelectric material of 1965 to 1976 does not only confirm their period, but, what is more, coherently obeys their elements,

$$C = 244\ 6364.567 + 10^{d}.658 \cdot E$$

Fig. 1 shows the whole of our brightness values folded with these elements. The comparison stars used and their magnitudes are given by Wenzel and Brückner (1978).

Additionally all but one of the deep visual and photographic minima (≥ 0.5 mag) described by Hoffmeister (1944) and Bradl (1978) as well as the - though shallow - three photoelectric fadings of Kardopolov and Shutemova (1980) and of Kovalchuk and Pugach (1980) are characterized by O-C values in the range of $\pm 0^{p}.14$, provided the above given period is improved by subtracting $0^{d}.00019$ and amounts to $P_1 = 10^{d}.65781$. Fig. 2 shows the O-C diagram, where dots represent photoelectrically observed fadings and crosses the deep (and therefore sure) visual and photographic minima; all material has been taken from the quoted papers and observational series.

Thus our observations point to a long-term existence and stability of the period and do not contradict the assumption of Grankin et al. (l.c.) that we deal with an orbital revolution in a binary system.

The reader must be aware of the fact that obviously the minima are of very different depth and that moreover in numerous cases they cannot be realized at all at the predicted dates. The model of Grankin et al. (l.c.) can account for these findings, but a thorough spectroscopic investigation

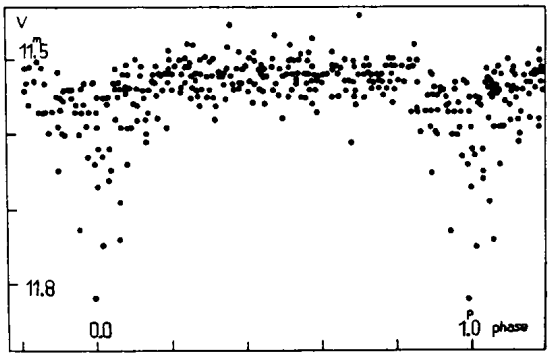

Figure 1

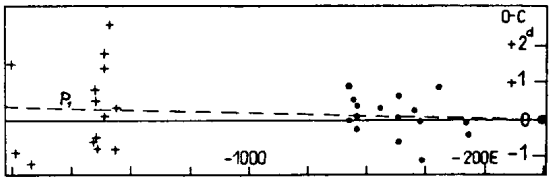

Figure 2

of this important object is clearly overdue. In this connection we remind of two more kinds of "eclipsing" stars with vanishing minima, represented by Kohoutek's central star V 651 Mon of a planetary nebula and by SS Lac with a possibly perturbed orbit, see Lehmann (1991). Maybe these cases are more numerous than hitherto supposed. The large number of eclipsing variables, for which no period could be found, could be explained in this way and must not be necessarily due to the scarcity of the respective data, as has been assumed frequently.

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