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EVIDENCE FOR VERY STRONG LIGHT-CURVE VARIATION OF THE CEPHEID IU Cyg

Wachmann (A.A. 1966, Abh. Hamburg 6,283) has derived the light-curve and light-elements of the cepheid IU Cyg for the time interval 1907/1960 from 424 photographic observations, tied into a photoelectric sequence. He found two instantaneous systems of elements, the later one being:

$$J.D.(max) = 243\ 6788.7 + 31^d31451\ n.$$

Eggen's (O.J.1969, Ap.J. 156,617) photoelectric observations of IU Cyg, made between June, 1962, and October, 1963, agree near maximum light very well with these element. They indicate, however, that the light curve of the variable has undergone drastic changes: Eggen's descending branch is much steeper and the asdending branch accordingly flatter; although Eggen's minimum is poorly determined, it is apparantly shifted by about 0.4 of the period to earlier phases. While on the basis of the older light curve the star was classified by Petit (M.1960, Ann.Astr.23,710) as a Delta Cep-type variable, Eggen's light curve is typical of W Vir-stars, which conforms with the period changes found by Wachmann and the great value of z, which one obtains from a population I period-luminosity relation (Fernie, J.D. and Hube, J.O.1968, A.J. 73,492).

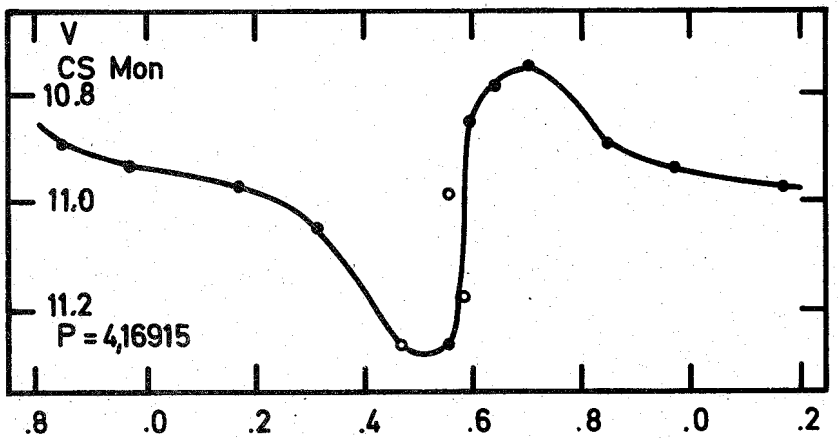
It is quite unlikely that the change of the light-curve is only the effect of photographic errors; this possibility is practically excluded by the shift of the minimum. A realistic estimate of the photographic errors even indicates that the increase in amplitude Δm_B from $1^m.3$ to $\geq 1^m.6$ is real.

Additional evidence for the supposed light-curve changes comes from the 8 photoelectric observations by Mitchell et al. (1960, Tonantzintla Bol.3,153), which cover the interval from September, 1960, to December, 1961. The four observations near maximum fit Eggen's light-curve reasonably well; the four observations near minimum, however, exhibit a quite erratic behaviour. It seems indicated, therefore, that IU Cyg went through an unstable transitional phase in 1960/61 before assuming the light-curve defined by Eggen's 1962/63-observations.

July 10, 1969

REMARKS ON THE LIGHT-ELEMENTS OF CS Mon

The period of the Delta Cep-variable CS Mon was determined by Ahnert et al.(Ver.Sonneberg 1,47). On the basis of only 70 visual observations they found a period of 6.68073 days.Adopting this period Eggen (1969, Ap.J.156,617 found from eight photoelectric observations a most unusual light curve with a narrow, bright secondary maximum, which he considered to be confirmed by four photoelectric observation made by Walraven et al. (1958, B.A.N. 14, 81) and transformed into the UBV-system by Mitchell et al. (1964, Tonantzintla Bol.3,153). However this confirmation holds only if Walraven's observations are shifted by an arbitrary amount of about 0.55 periods. In addition the maxima determined by Ahnert et al. (Ver.Sonneberg 1,47) do not agree in phase with Eggen's light curve.



This evidence strongly suggests that the period for CS Mon is ,incorrect. The available data do not suffice to determine a reliable period; however, they do suggest that the period lies near four days. Eggen's observations can well be represented by an asymetric, but not unusual light curve with the following light-elements (see illustration, dots):

$$J.D.(max) = 2437899.0 + 4.16915\ n$$

The observations by Walraven et al. (open circles) scatter around the light curve by $\pm\ 0^{m}_{.}14$, which does not seem to be prohibitive considering the necessary magnitude transformation.

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