

COMMISSION 27 OF THE I. A. U.  
 INFORMATION BULLETIN ON VARIABLE STARS  
 Number 1131

Konkoly Observatory  
 Budapest  
 1976 May 4

ON CHANGES OF PERIOD OF PULSATING STARS

A loose correlation had been found by Vasiljanovskaya and Erleksova (1968) between period and abrupt change of period for Population II Cepheids. The changes of period we have found in recent years at the Maria Mitchell Observatory for Mira and RR Lyrae type stars seemed to fall nicely along the projections of this relation. I have therefore scanned the Remarks in the GCVS and its Supplements in order to ascertain how general this relation is.

In Figure 1 are plotted the values of  $\log(\Delta P/P)$  against  $\log P$ , where  $\Delta P$  is the maximum difference between the various periods published for any given star. Stars with ostensibly constantly changing periods ( $JD_{\max} = JD_0 + nP_0 + kn^2$ ) are included, the change of period adopted in the Figure corresponding to a twenty-year interval from the epoch of  $P_0$ . For such stars it is frequently unclear

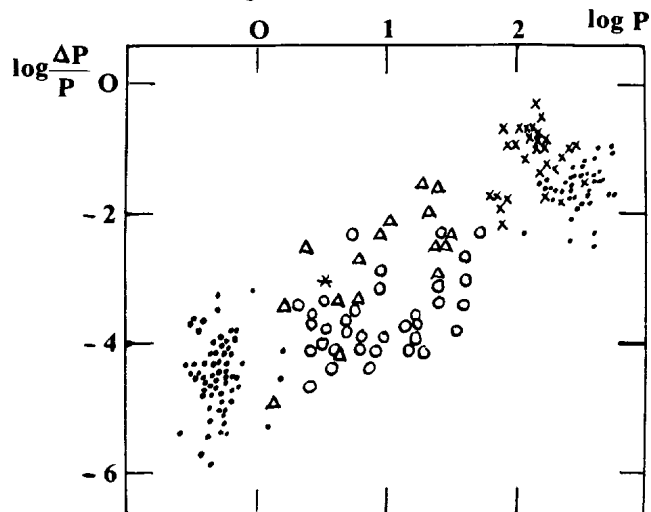


Figure 1. Observed relationship between periods and extreme changes of period. Symbols: dots at right, Mira type; crosses, SR; triangles, W Virginis; open circles, classical Cepheids; dots at left, RR Lyrae stars. The one asterisk is for CG And, classified as  $\alpha$  C Vn type.

whether a progressive or sudden change of period is the more probable. Omitted are a few stars for which the original references indicated insufficient data to substantiate the indicated changes of period. Stars with recorded Blazko effect, and those whose periods appear to change cyclically as indicated by sine or cosine terms were disregarded.

The average values for each type of variable represented are shown in Figure 2. The W Virginis stars and the  $\delta$  Cepheids are each divided into two groups, those longer and those shorter than ten days. The RR Lyrae stars are separated into three groups: those with sub-class ab (52 stars), sub-class c (7) and the ones for which no sub-type is given (11). For comparison, the open circle shows the average for the more thoroughly investigated galactic RR Lyrae type stars published by Tsesевич (1972) and those in M5 studied by Coutts and Hogg (1969).

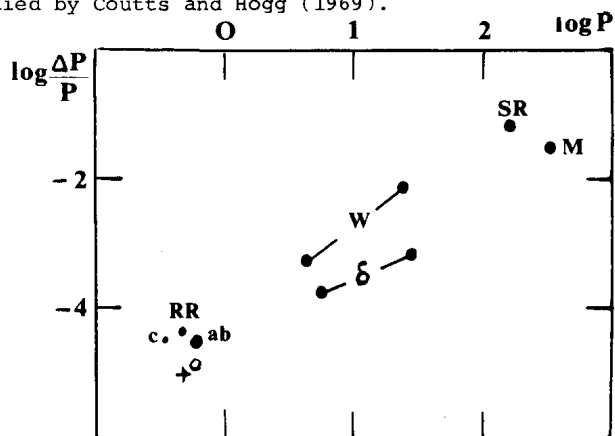


Figure 2. Mean points for the various types of stars in Figure 1. The open circle represents the galactic RR Lyrae stars investigated by Tsesевич; the cross, those in M5 analysed by Coutts and Hogg.

DORRIT HOFFLEIT  
 Maria Mitchell Observatory  
 Nantucket, Mass., U.S.A.

References:

- Coutts, C.M., Hogg, H.S. 1969, Pub. David Dunlap Obs. 3, 1-58  
 Tsesевич, V. 1972, Vistas in Astronomy, A.Beer, ed., 13, 241-256  
 Vasiljanovskaya, O.P., and Erleksova, G.E. 1968, Non-Periodic Phenomena in Var. Stars, L.Detre, ed., Budapest, 321-324