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# DEVELOPMENT OF A NEW 4-YEAR CYCLE IN THE 41-DAY PERIOD OF RR LYRAE

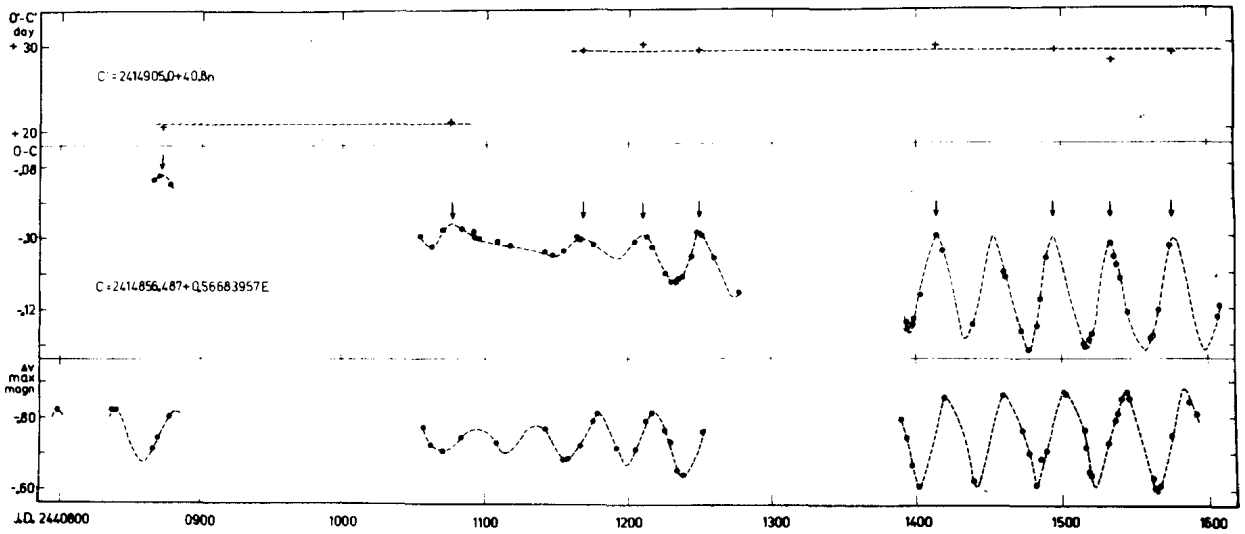
Long series of our photoelectric observations of RR Lyrae made a 4-year period in the variations connected with the 41-day cycle evident. (Detre,L., Szeidl,B., Proc.41 IAU Colloquium, Toronto 1972, in press) In the fall of 1970 and early 1971 the amplitude of the 41-day cycle became again very small indicating the near end of the last 4-year cycle.

In order to study the transition from the old cycle to the expected new one we observed the star photoelectrically in B, V at our 24-inch reflector every night in the past two years whenever it was possible (20 maxima and 28 rising branches in 1971 while 29 maxima and 30 rising branches in 1972). The results for the visual maxima and phase shifts of the median brightness are shown in the Figure. The phases are calculated by using the formulae given in Detre,L., 1970, Ann.d.Univ.-Sternwarte Wien, Bd.29.,Nr.2.,p.89. and shown in the Figure.

At the end of the 4-year cycle the phase variations during the 41-day cycle died almost completely down and then the new cycle started with a rapid increase of the amplitude of the phase oscillation. The amplitude of the maximum-variations was only $0^m.07$ at the end of the old cycle (June 1971) and then it became very rapidly as large as $0^m.16$ (October 1971). By the beginning of the 1972 observing period the amplitude of the maximum-variations had approached its maximum value and was nearly constant ($0^m.25$ in April and $0^m.28$ in October 1972).

The most interesting was the phase shift in the 41-day period. O-C' was about $+19^d$ during the whole old cycle till June 1971 while it has been $+29^d$ for the new one since July 1971. Consequently, the beginning of the new cycle was accompanied by an abrupt phase shift of 10 days, about the fourth of the 41-day period. During one and the same 4-year cycle the 41-day period remained constant.

L. DETRE and B. SZEIDL
Konkoly Observatory
Budapest


O-C'
day
+ 30
C' = 2414905,0+40,8n
+ 20
O-C
-,08
-,10
C = 2414856,487+0,56683957E
-,12
Δv
max
magn
-,50
-,60
J.D. 2440800
0900
1000
1100
1200
1300
1400
1500
1600