



Astrophysics > Solar and Stellar Astrophysics

Period Change Similarities among the RR Lyrae Variables in Oosterhoff I and Oosterhoff II Globular Systems

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We present period change rates (dP/dt) for 42 RR Lyrae variables in the globular cluster IC 4499. Despite clear evidence of these period increases or decreases, the observed period change rates are an order of magnitude larger than predicted from theoretical models of this cluster. We find there is a preference for increasing periods, a phenomenon observed in most RR Lyrae stars in Milky Way globular clusters. The period-change rates as a function of position in the period-amplitude plane are used to examine possible evolutionary effects in OoI clusters, OoII clusters, field RR Lyrae stars and the mixed-population cluster ω -Centauri. It is found that there is no correlation between the period change rate and the typical definition of Oosterhoff groups. If the RR Lyrae period changes correspond with evolutionary effects, this would be in contrast to the hypothesis that RR Lyrae variables in OoII systems are evolved HB stars that spent their ZAHB phase on the blue side of the instability strip. This may suggest that age may not be the primary explanation for the Oosterhoff types.

Comments: accepted to AJ

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