
RR Lyraes and binarity

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Abstract

Although usually about half of all stars are considered to be part of binary or multiple systems, there are only two confirmed cases of RR Lyrae pulsators with companions. One of them is TU Uma - a classical RR Lyrae star in a very eccentric orbit - and the other is OGLE-BLG-RRLYR-02792 which is thought to have reached the instability strip not via the classical evolutionary path but through binary interaction that led to dramatic mass loss. Considering the wealth of well-studied RR Lyrae stars, this number is astoundingly low. The lack of binary RR Lyrae stars is especially surprising as in low metallicity environments such as those in which RR Lyrae stars were formed, the probability of cloud fragmentation is considered to be higher, and therefore also the binary frequency is expected to be higher. The data from the Kepler mission with their unprecedented precision and long time span offer a unique possibility to systematically search for the signatures of binarity in RR Lyrae stars. Using the pulsation as a clock, we studied the variations in the timing of maximum light to hunt for possible binary systems in the sample. We will present the results of our O-C study, as well as some new photometric as well as spectroscopic measurements of the known RR Lyr binary TU Uma.

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