Dynamical investigation of modulated Kepler RR Lyrae stars

Emese Plachy*[1,2], József Benkő[1], and Zoltán Kolláth[1,2]

[1]Konkoly Observatory MTA CSFK – H-1121 Budapest, Konkoly Thege Miklós út 15-17., Hungary
[2]University of West Hungary Savaria Campus – H-9700 Szombathely, Károlyi Gáspár tér 4., Hungary

Abstract

A nonlinear dynamical analysis requires long and quasicontinuous data. In the case of Blazhko modulation that could only be achieved with Kepler. In this talk we demonstrate that in the case of V783 Cyg (KIC 5559631), the shortest Blazhko-period star from the sample, chaotic behaviour can be detected in the 51 modulation cycles collected between Q1 and Q16. We applied different techniques to separate the modulation curve from the pulsation. We determined the quantitative properties of the underlying dynamics with the global flow reconstruction method. This is the first time that chaotic modulation was reliably identified in an RR Lyrae star.

*Speaker