Contributing to the EE Cep campaign

Introduction

EE Cephei (R.A.: 22 09 22.757, Dec.: +55 45 24.184, J2000.0) is a variable star of spectral type Be5 III (Mikolajewski & Graczyk 1999, Mikolajewski et al. 2005), with a period of 2050 days (approximately 5.6 years; Meinunger 1976), and an eclipse duration of about 40 days.

Its variability was detected in 1952 (Romano 1956) and soon it was identified as an eclipsing binary system (Romano & Perissinotto 1966). Up to date we have observed a total of 12 eclipses which however present large differences in their duration and depth (see Fig. 1). Mikolajewski & Graczyk (1999) suggested the presence of an opaque disk surrounding the secondary, which is either a low-mass star or a close binary system. A tilt in the disk and a possible precession of the rotation axis of the main Be star (Pieńkowski et al. 2020) can explain the different shapes of its eclipses (see Fig. 2)

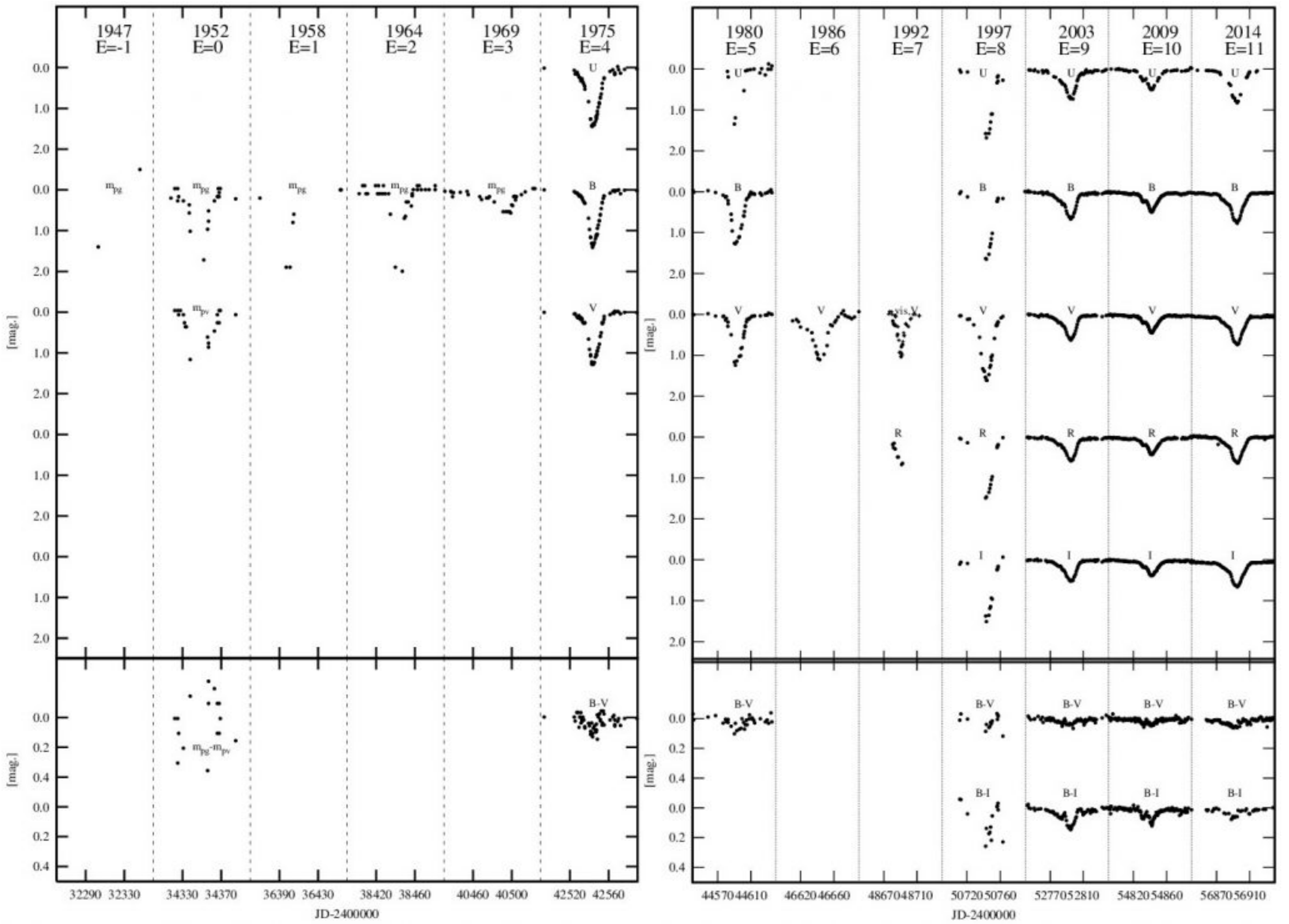

Figure 1: All light curves from EE Cep, in various bands and colors (source: [EE Cep 2020](#)).

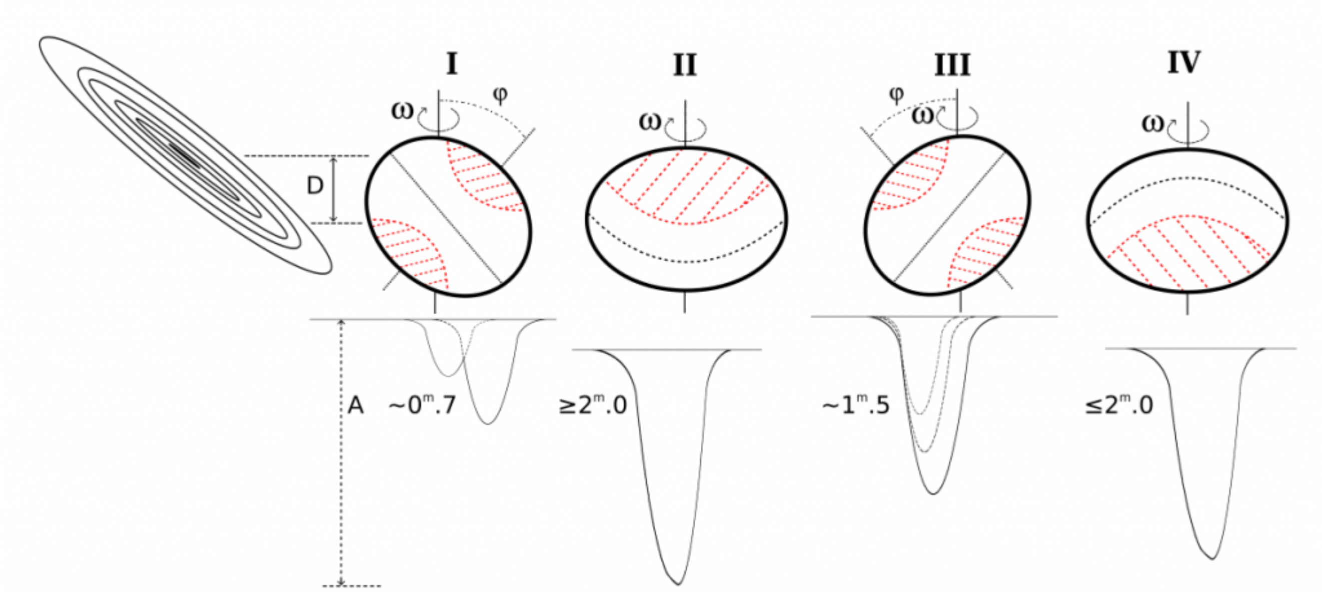

Figure 2: The proposed model for EE Cep. A thick disk (or rings) passes in front of the primary star Be which rotates around its axis and due to the precession it exhibits different parts of its

surface (Pieńkowski et al. 2020).

Until today three major observing campaigns have been organized in order to uncover the mysteries of EE Cep: in 2003, 2009 and 2014 (Galan et al. 2012, 2014). Despite the wealth of the data collected we still miss a consistent description for the system (Pieńkowski et al. 2020).

Contribution to the current campaign

We have participated in the [last international campaign of 2014] with a number of CCD measurements that cover the whole duration of the eclipse. Our results have been published in the 9th Panhellenic Conference on Amateur Astronomy (Maravelias et. al. 2015 – [in Greek]). In Fig. 3 we show the light curve from these observations.

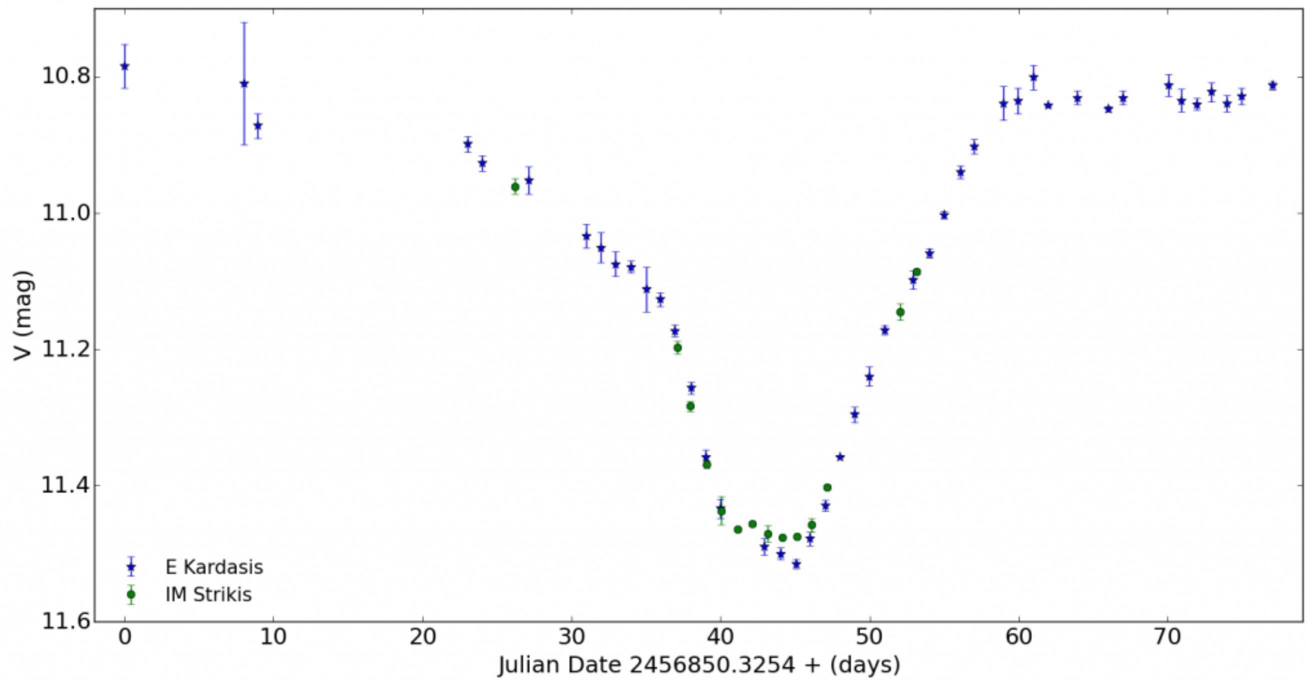

Figure 3: The light curve of EE Cep during its 2014 eclipse from HAAA' members' observations.

Given this experience we are carefully monitoring the current eclipse of 2020, using private and remote telescopes to secure observations at every possible occasion. Our observations will be forwarded to the international observing campaign of 2020-2021 (see the site for more details regarding observations), while we plan to publish our results in a forthcoming paper.

Stay tuned !

References

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Imaging dense globular clusters like M3 and M15

During the Society for Astronomical Sciences 29th Annual Symposium on Telescope Science (held May 11-13, 2010 at Big Bear Lake, CA) the following work was published:

Imaging dense globular clusters like M3 and M15

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Abstract
The objective for this study will be to explore new photometric methods for amateur telescope observations of 'cluster variables' and globular clusters using CCD photometry. Amateur telescope photometric observations of 'cluster variables' in globular clusters are limited because of dense, crowded star fields. However, with improvements in CCD photometric methods, there are opportunities to observe cluster variables, such as RR Lyrae and SX Phoenicis type stars, through time series analysis of multiple exposures of whole cluster images. Traditional methods for determining light curves in 'field' RR Lyrae and SX Phoenicis type stars require selection of comparison and perhaps check stars to perform differential photometry; i.e. subtraction of flux density measures between a non-variable (comparison star) and the variable star as they change in magnitudes over time. We explore the possibility of measuring the variable star's

periodicity in areas, or sections of a globular cluster, to sort different stellar type ‘cluster variables’ within each section of the cluster. There are areas or regions of a globular cluster which ‘pulsate’ at a variable rate which is representative of ‘cluster variables’ that make up that region. For example: we have detected different variability periods within the ‘core’ of a cluster compared to the outer circumference areas of the cluster.

A link to the work can be found to NASA/ADS: 2010SASS…29..129H