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## BVIc CCD Observations of RR Lyrae variable SU Hor

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We present 3965 magnitude measurements in the B, V, and  $I_c$  filters acquired for the RR Lyrae star SU Hor. The star shows Blazhko effect.

## 1 Introduction

In 2009, we started a program aimed at obtaining photometric observations for RR Lyrae variables that had no reliable light curves. The first results of our photometry were published by Berdnikov et al. (2012) who suspected the presence of Blazhko effect (Blazhko, 1907) for several stars, including SU Hor.

To study the Blazhko effect, we continued to observe SU Hor. Here we present the results of our photometry.

## 2 Observational data

We performed new CCD observations of SU Hor in 2012–2014 (in the JD 2455896–2456679 range) with the 76-cm telescope of the South African Astronomical Observatory (SAAO) using a SBIG CCD ST-10XME camera equipped with  $BVI_c$ -band filters of the Kron–Cousins photometric system (Cousins, 1976). A description of the observing data reduction technique can be found in our previous paper (Berdnikov, 2012). We acquired a total of 2900 CCD frames, where extracted magnitudes of SU Hor had errors close to 0.01 mag.

We also used the Las Cumbres Observatory Global Telescope (LCOGT) Network (Brown et al., 2013) to acquire 1065 CCD  $BVI_c$  frames during the time interval JD 2456633–2456689. We reduce LCOGT observations by performing differential photometry relative to secondary standards whose magnitudes we determined based on observations made in SAAO; the photometric errors of these observations are close to 0.02 mag.

All observations are available in a text file (Table 1) in the html version of the paper.

The light curves are shown in Fig. 1, where the big scatter of points supports the presence of Blazhko effect. We plan to use our data to search for the Blazhko effect period.

On the base of our observations we constructed the B-, V-, and  $I_c$ -band template curves, presented in Table 2 (in the html version of the paper) and Fig. 2; together with

them, we present the g'-band template curve, based on observations from the ASAS-SN catalog (Jayasinghe et al., 2019). Table 2 lists the g'-, B-, V-, and  $I_c$ -band magnitudes of SU Hor at phases from 0 to 0.995 with a step of 0.005.

We plan to use these templates to study the behavior of pulsating period of SU Hor.



*SU Hor* Max JDH = 2456689.1387 + 0.46956948 E

**Figure 1.** Phased  $BVI_c$  light curves of the RR Lyrae star SU Hor. Big scatter is due to the Blazhko effect.

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## References:

Berdnikov, L.N., Vozyakova, O.V., Kniazev, A.Yu., et al. 2012, Astron. Rep., 56, 290 Blazhko, S. 1907, Astron. Nachr., 175, 325

Brown, T.M., Baliber, N., Bianco, F.B., et al. 2013, *Publ. Astron. Soc. Pacif.*, **125**, 1031 Cousins, A.W.J. 1976, *Mem. RAS*, **81**, 25

Jayasinghe, T., Stanek, K.Z., Kochanek, C.S., et al. 2019, Mon. Not. Roy. Astron. Soc., 485, 961



Figure 2. g'-, B-, V-, and  $I_c$ -band template light curves of SU Hor.