

We found the amplitude and phase modulations with the amplitudes of 0.16 mag in V filter and 0.041 of the pulsating phase, 0.15 mag in R filter and 0.041 of the pulsating phase, respectively.

The frequency Fourier analysis of the light curves with the help of Period04 software was performed, Blazhko modulation period (59.20 days) and triplet structures in the Fourier spectrum were detected.

The pulsation frequency components in the Fourier spectrum were identified up to the 7th harmonic order, while the modulation side lobe frequencies – up to 9th order.

The analysis of the light curves maxima resulted in the same value of the Blazhko period. The fundamental pulsation period of the star has been practically stable over a period of a hundred years.

SPECTROSCOPIC INVESTIGATIONS OF POLARIS (\$\alpha\$ UMI) SYSTEM: RADIAL VELOCITY MEASUREMENTS, NEW ORBIT, AND COMPANION'S INFLUENCE FOR THE CEPHEID'S PULSATION ACTIVITY

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New 33 spectra of Polaris system obtained during Aug-Dec 2019 and Feb-Apr 2020 observational seasons using 0.81m telescope of the Three College Observatory (TCO) (North Carolina, USA) were used to determine its

radial velocities and effective temperature of Cepheid Polaris Aa. These new RV data have been added to the all Polaris system RV data list (more 2.500 estimates) to compute the new orbit of Polaris Ab companion. Furthermore we have used our eight 2015-2020 observational sets and eight 2011-2018 ones from Anderson (2019) to check the influence of Polaris Ab orbital motion for Polaris Aa pulsational activity.

It would be detected the mean pulsational period during 2015-2020 is about stable (3.9722 ± 0.001 days), whereas pulsational amplitude shows an evident changes, - a growth before HJD 2457350 with next decrease. This fact could be concerned with Polaris Ab passing through the periastrer.

STUDIES OF ACTINIUM LINES IN THE SPECTRA OF STARS WITH ANOMALOUS HYDROGEN PROFILES. CEPHEIDS.

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The radioactive element actinium is a decay product of the uranium series, is studied in variable stars.

The spectra of stars with anomalous hydrogen lines, which are not described by the theoretical classical spectrum with the chosen atmospheric parameters, are considered. These are the spectra of the Cepheids.

1. For the hottest Cepheids of the Magellanic Clouds, actinium lines are identified and their abundances are higher.

2. In the blue region, where the lines of the actinium should be stronger than in the visible region, the strong lines of the actinium are strongly blended, which requires careful work using the synthetic spectrum.