

[7ST-03] Period Study and Light Curve Synthesis of BD Andromedae

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New CCD BVR light curves of BD And are presented. Our light curves with nearly equal depths for both primary and secondary eclipses show well-defined photometric waves outside eclipse for all of *BVR* bandpasses. The orbital period is greatly revised as 0.^q92580519 which is twice longer than that known previously. Sixteen timings from our observations and thirteen ones from the SuperWASP measurements were calculated. All available timings over 76 years, including ours, were analyzed to figure out the dynamical behavior of the system. It was found that the recent CCD *O-C* residuals varied in a cyclical way with a period of 9.^y18 and a semi-amplitude of 0.^q0046. The secondary period of 9.^y18 is the most shortest one among those which have been ever found in the short period RS CVn binary stars. The periodic variation most likely arises from the light-travel time effect due to a low-mass ($m_3 \sim 0.88 M_\odot$) tertiary companion moving in an orbit with an large eccentricity ($e_3=0.70$) and a low inclination ($i_3 \sim 28^\circ$). The Applegate mechanism could not operate properly in both components because the model parameters require too much large luminosity changes of $\Delta L/L_{p,s} > 10$. The new light curves were synthesized using the 2003 version of Wilson-Divinsky code. It was found useful to model two huge spots on the surface of the hotter star and a third-light in order to minimize the residuals from the observations. Astronomical basic parameters were deduced from our photometric solution.

[7ST-04] Physical parameters of the detached eclipsing binary KIC3858884

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We present physical parameters of the detached eclipsing binary KIC3858884, which has a d-Scuti type pulsating secondary component. To derive orbital elements from radial-velocity curve, high-resolution Echelle spectra were obtained at the Bohyunsan Optical Astronomy Observatory in Korea. The BOES spectra and Kepler photometric data were analyzed with JKTEBOP and Wilson-Devinney model for eclipsing light-curve synthesis and Period04 for pulsation frequency analysis. After the iterative curve fitting, we determined physical parameters of KIC3858884 as $M_1=2.02\pm 0.23M_\odot$, $M_2=2.02\pm 0.16M_\odot$, $R_1=3.61\pm 0.12R_\odot$, $R_2=2.84\pm 0.10R_\odot$, respectively.