

Argus, AB Doradus, and Volans-Carina) were rediscovered. Three the other known groups are recognized as well; however, they are combined into two new separate groups (ThOr+Columba and TucHor+Columba).

[구 SA-03] Absolute Dimensions And Period Changes Of The Semi-Detached Algol Type Binary XZ Canis Minoris

Hye-Young Kim¹, Chun-Hwey Kim¹, Kyeongsoo Hong¹, Min-Ji Jeong¹, Jang-Ho Park², Mi-Hwa Song¹, Jae Woo Lee², Chung-Uk Lee²
¹Chungbuk National University, ²Korea Astronomy and Space Science Institute

The first high-resolution spectroscopic and new multiband photometric observations of the semi-detached Algol type binary XZ CMi were performed at the Bohyunsan Optical Astronomy Observatory (BOAO) and the Sobaeksan Optical Astronomy Observatory (SOAO), respectively. A total of 34 spectra were obtained using the 1.8 m reflector of the BOAO equipped with the Bohyunsan Optical Echelle Spectrograph to construct the radial velocity (RV) curves of the eclipsing pair. New *BVRI* photometric light curves were also covered by using the SOAO 61cm reflector and a CCD camera. A detailed analysis of all eclipse timings shows that the orbital period of XZ CMi has varied in an upward parabolic variation superposed on a sinusoidal oscillation with a period of 38.0 yr and a semi-amplitude of 0.0071 days. From the spectral analysis, the effective temperature and the projected rotational velocity of the primary component were determined to be $T_{\text{eff},1} = 7387 \pm 161$ K and $v_1 \sin i = 122 \pm 6$ km s⁻¹, respectively. Our simultaneous synthesis of the double-lined RV and *BVRI* light curves gives the reliable system parameters of XZ CMi with a mass ratio (q) of 0.314, an orbital inclination (i) of 81.9 deg and a large temperature difference (ΔT) of 2481 K. The individual masses and radii of both components are $M_1 = 1.91 \pm 0.08 M_{\odot}$, $M_2 = 0.60 \pm 0.02 M_{\odot}$, $R_1 = 1.60 \pm 0.02 R_{\odot}$, $R_2 = 1.13 \pm 0.02 R_{\odot}$, respectively. Although the primary component is located inside the δ Sct and γ Dor instability strips, no evidence of pulsation in the system was detected. The possible evolutionary status of XZ CMi is discussed.

[구 SA-04] Is there a stellar companion in hybrid star HD 81817?

Tae-Yang Bang^{1,4}, Byeong-Cheol Lee^{2,3}, V. Perdelwitz⁵, Gwang-Hui Jeong^{2,3}, Inwoo Han^{2,3}, Hyeong-il Oh^{1,2}, and Myeong-Gu Park^{1,4},

¹Department of Astronomy and Atmospheric Sciences, Kyungpook National University, 80 Daehakro, Bukgu, 41566 Daegu, Korea
e-mail: (qkdxodid1230,ymy501,mgp)@knu.ac.kr

²Korea Astronomy and Space Science Institute, 776 Daedukdae-ro, Yuseong-gu, 34055 Daejeon, Korea
e-mail: (bcllee,tlotv,iwhan)@kasi.re.kr

³Korea University of Science and Technology, 217 Gajeong-ro, Yuseong-gu, 34113 Daejeon, Korea

⁴Research and Training Team for Future Creative Astrophysicists and Cosmologists (BK21 Plus Program)

⁵Hamburger Sternwarte, Gojenbergsweg 112, 21029, Hamburg, Germany
e-mail: vperdelwitz@hs.uni-hamburg.de

HD 81817 is known as a hybrid star. Hybrid stars have both cool stellar wind properties and UV or even X-ray emission features of highly ionized atoms in their spectra. A white dwarf companion has been suggested as the source of UV or X-ray features. HD 81817 has been observed since 2004 as a part of our radial velocity (RV) survey program to search for exoplanets around K giant stars using the Bohyunsan Observatory Echelle Spectrograph (BOES) at the 1.8 m telescope of Bohyunsan Optical Astronomy Observatory (BOAO) in Korea. We obtained 84 RV measurements between 2004 and 2018 for HD 81817 and found two periodic RV variations. The obtained amplitudes of RV periods are around 200 m/s, which are significantly lower than that expected from a white dwarf companion. Furthermore, our re-analysis of the IUE spectra used by Reimers (1984) shows that the excess in UV emission can easily be explained by a pseudo-continuum of unresolved emission lines originating in the extended chromosphere of the star. We thus conclude that there are no companions of stellar mass to HD 81817. Meanwhile, we analyzed two periodicities in RV measurements and conclude that the period of 627.9 days is caused by intrinsic stellar activities based on H alpha equivalent width (EW) variations of a similar period. On the other hand, the period of 1047.8 days is likely to be caused by substellar companion which has a minimum mass of 27.6 M_{JUP} , a semi-major axis of 3.3 AU, and an eccentricity of 0.17 assuming the stellar mass of 4.3 M_{\odot} for HD 81817. The inferred mass puts HD 81817 b in the brown dwarf desert.

[구 SA-05] The effects of circumstellar medium on Type Ic supernova light curve and color evolution and implications for LSQ14efd

Harim Jin¹, Sung-Chul Yoon^{1,2,3}