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We present the TESS photometry and our high-resolution spectra of the semi-detached Algol EW Boo. For an orbital period study, we collected all available times of minima including ours for the last 30 years. It is found that the eclipse timing variation of the system can be represented by a periodic oscillation of 18.5±1.0 yr plus a secular period increase with a rate of $[dP/dt]_{\rm orb}=-6(\pm3)\times10^{-8}$ d yr^{-1}. From our observed spectra, the effective temperature of the primary star was determined to be $T_{\rm eff,1}=8560\pm118$ K. From a simultaneous analysis of the TESS light and our double-lined radial velocity curves, the absolute masses, radii, and luminosities are $M_1=2.30\pm0.07\,{\rm M}_\odot$, $M_2=0.38\pm0.01\,{\rm M}_\odot$, $R_1=1.92\pm0.02\,{\rm R}_\odot$, $R_2=1.27\pm0.01\,{\rm R}_\odot$, $L_1=1.92\pm0.02\,{\rm L}_\odot$, and $L_2=0.752\pm0.007\,{\rm L}_\odot$, respectively. Multiple frequency analyses were carried out for the light residuals after subtracting the binary star model. We detected a total of 75 frequencies in the region of 16.50-104.8 day-1. Our results demonstrate that the more hotter primary star of EW Boo is a δ Sct pulsator by considering its position in the δ Scuti region of the Cepheid instability strip and pulsational characteristics.

[구 SA-03] *Absolute calibration of near-infrared Period-Luminosity-Metallicity relations for RR Lyrae variables using Gaia EDR3*

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RR Lyrae stars are sensitive probe for the precision stellar astrophysics and also for the cosmic distance scale thanks to their well-defined near-infrared Period-Luminosity relations (PLRs). These horizontal branch variables can be used for primary calibration of the first-rung of population II distance ladder providing an evaluation of the ongoing tension between Cepheid-Supernovae based Hubble constant and the Planck results. Therefore, absolute calibration of RR Lyrae PLRs is now crucial to complement or test the tip of the red giant branch based distances, and in turn, population II star based Hubble constant measurements. While the pulsation models of RR Lyrae can reproduce most observables, they predict a significant metallicity effect on their JHKs-band PLRs that is inconsistent with so-far limited observational studies. We remedy this inconsistency of metallicity dependence in RR Lyrae PLRs by combining their near-infrared observations in the globular clusters of different mean-metallicities with the new parallaxes from the Gaia early data release 3 (EDR3). Our empirical results on Period-Luminosity-Metallicity (PLZ)relations are consistent with theoretical predictions but the precision of absolute calibrations is still affected by the parallax uncertainties and the systematic zero-point offset present in the Gaia EDR3.

[구 SA-04] Variable Blue Stragglers in the Metal-Poor Globular Clusters in the Large Magellanic Cloud - Hodge 11 and NGC1466

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Blue straggler stars (BSs) are “rejuvenated” main sequence stars first recognized by Allan Sandage from his observation of the prominent northern globular cluster M3 in the year of 1953. BSs are now known to be present in diverse stellar environments including open clusters, globular clusters, dwarf galaxies, and even the field populations of the Milky Way. This makes them a very useful tool in a wide range of astrophysical applications: Particularly BSs are considered to have a crucial role in the evolution of stellar clusters because they affect on the dynamics, the binary population, and the history of the stellar evolution of the cluster they belong to. Here we report a part of the preliminary results from our ongoing research on the BSs in the two metal-poor globular clusters (GCs) in the Large Magellanic Cloud (LMC), Hodge 11 and NGC1466. Using the high precision multi-band images obtained with the Advanced Camera for Survey (ACS) onboard the Hubble Space Telescope (HST), we extract time-series photometry to search for the signal of periodic variations in the luminosity of the BSs. Our preliminary results confirm that several BSs are intrinsic “short period (0.05 < P < 0.25 days)” variable stars with either pulsating or eclipsing types. We will discuss our investigation on the properties of those variable BS candidates in the context of the formation channels of these exotic main sequence stars, and their roles in the dynamical evolution of the host star clusters.