[구ST-05] Identification and spectral analysis of the CIBER/LRS detected stars

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CIBER (Cosmic Infrared Background ExpeRiment) is a sounding-rocket borne experiment which is designed to find the evidence of the First stars (Pop.III stars) in the universe. They are expected to be formed between the recombination era at $z \sim 1100$ and the most distant quasar ($z \sim 8$). They have never been directly detected due to its faintness so far, but can be observed as a background radiation at around 1μm which is called the Cosmic Near-Infrared Background (CNB).

The CIBER is successfully launched on July 10, 2010 at White Sands Missile Range, New Mexico, USA. It consists of three kinds of instruments. One of them is a LRS (Low Resolution Spectrometer) which is a refractive telescope of 5.5 cm aperture with spectral resolution of 20 ~ 30 and wavelength coverage of 0.7 to 2.0μm to measure the spectrum of the CNB. Since LRS detects not only CNB but also stellar components, we can study their spectral features with the broad band advantage especially at around 1μm which is difficult at ground observations because of the atmospheric absorption by water vapor. I identified around 300 stars from observed six fields. If we can classify their spectral types with SED fitting, we can study their physical conditions of the stellar atmosphere as well as making a stellar catalogue of continuous stellar spectrum.

[구ST-06] Fundamental parameters of the eclipsing binaries in the Large Magellanic cloud

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We present photometric solutions of the 26,212 eclipsing binaries discovered in the LMC by Graczyk et al. (2011). They published that 70 percent of a total are detached systems. Another 25 and 5 percent are semi-detached and contact binaries, respectively. We discovered that 21 percent of 26,121 eclipsing binary stars are eccentric orbit systems. The binary star distribution in the LMC is different from those of the Galactic center direction (Bade window). It is very interesting that there are only 5 of 357 (2 percent) stars have eccentric orbit in the Galactic Center (Kang 2011). We selected the light curve of 18,274 detached systems. Then we estimated the fundamental parameters on the basis of their photometric solutions and the semi-major-axis (a) assuming the distance modulus to the LMC ~ 18.50. We compared the estimated fundamental parameters with an empirical mass-luminosity relation and consistency between mass-radius relation base on stellar evolution model in the low metallicity (Z=0.008) by Bertelli et al. (2009). This method allows for independent determine of the fundamental parameters of the eclipsing binaries in the LMC without the radial velocity curves.