

## UV space telescope for exoplanetary systems

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Many observations have been carried out for exoplanets since they were first discovered in 1995. To date, the number of detected exoplanets is more than 1900. Some of them are known about their atmospheric composition.

Compared the Earth with the planets which exist in solar system, the Earth has much more oxygen which is produced by photosynthesis. Therefore, detection of oxygen on planets is one of the key factors to characterize exoplanets. In this work, we aim to detect O I emission (130.6 nm) in planet atmospheres by using UV space telescope.

Because planets orbit around its parent star, light of planets whose wavelength is slightly changed with Doppler shift is observed. Therefore, if Doppler shift is large and the parent star's continuum doesn't exist, emissions of planets can be separated from light of its parent star by using high dispersion spectrometer. Because the habitable zones of low-temperature stars are near the parent star, if an Earth-like planet exists in the habitable zone of a low-temperature star, the orbital velocity is fast and the Doppler shift is large. In this work, we assume that the Earth exists in the habitable zones of low temperature star. Then, planetary O I emission can be separated from its parent star. However, because its intensity is very weak, we need to use a large and high efficiency telescope, which exceeds Hubble Space Telescope.

NASA and ESA are planning to launch space telescope dedicated to exoplanets; however, their spectral ranges are limited to the visible and infrared regions. Therefore, we are planning to develop a UV space telescope dedicated to exoplanetary systems. In this presentation, we introduce the study situation and specification of instruments.

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