Optical and infrared measurements of planetary atmospheres with the T60 telescope and the future PLANETS mission at Haleakala, Hawaii

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We successfully relocated the 60-cm Cassegrain and Coude telescope (T60) from the Iitate observatory to the summit of Mt. Haleakala, Maui, Hawaii in September 2014. We installed an mid-infrared heterodyne spectrometer called MILAHI, which has super-high spectral resolution ofλ/dλ ~ 10^6-7 and started its initial run attached to T60. The instrumental capability and feasibility were demonstrated by solar observations (terrestrial and solar atmospheres). We are going to Martian observations in Nov 2014 and March-September 2015 for the monitor of lower atmosphere just below MAVEN observations.

In addition, a new monochromatic imager with an Occulting mask and a Lyot stop was been developed for T60. We confirmed that the imager successfully decreases diffraction from bright main body by factor of 2-3 for axisymmetric background contamination as well as by order of 1 for cross-shaped background contamination. Long-term monitoring of faint emissions close to the planets, e.g. Jupiter plasma torus, Enceladus torus, will be achieved using this high-dynamic imaging capability with high-spectral resolution.