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Ground-based observation of planets conducted by Planetary Plasma and Atmospheric Research Center: present and future

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Planetary Plasma and Atmospheric Research Center of Tohoku University was established in 199 9 to clarify the mystery of planets by detecting weak signals that arrive at Earth via optical and radio emissions from planets, and to uncover the physical processes that drive change in these planetary environments. About a decade has passed since then. During this period, the Iitate Planetary Radio Telescope (IPRT) was installed as a radio observation facility in Fukushima prefecture, and a 40cm diameter optical telescope was installed at the summit of Mt. Haleakala, Maui, Hawaii for making observation of planets.
As a target of science being studied in our research center, the magnetosphere of Jupiter is listed first.
Observation of synchrotron radiation coming from the radiation belt of Jupiter is being conducted with IPRT to understand the acceleration mechanism of high energy electrons in the radiation belt of Jupiter, along with observation of emissions of sulfur ion and sodium atoms originated from volcanic activity on the satellite Io, which is being made at Haleakala.
In addition to observation of Jupiter, an image of sodium tail on Mercury was obtained and detection of oxygen emission in Enceladus torus, originated from the water plume from a satellite of Saturn, Enceladus, was made with the telescope at Haleakala, which is operated remotely from Japan.
In order to expand these activities in planetary observation, we plan to deploy a sub-station to IPRT for making an radio interferometer, and to construct a new telescope dedicated to observation of planets at Haleakala.
Observational results obtained so far and our future plan will be given at the presentation.

Keywords: Ground-based observation, Optical, Radio wave, Jupiter's magnetosphere