International Session (Oral) | Symbol P (Space and Planetary Sciences) | P-PS Planetary Sciences

[P-PS01_30PM2]Toward JUICE and future explorations of outer solar system

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Wed. Apr 30, 2014 4:15 PM - 6:00 PM 418 (4F)

Giant planets are the most prominent representative bodies not only in the solar system but also in the extrasolar systems. In this session, origin, interior, atmosphere, composition, surface feature, and electro-magnetic field etc. of the Jovian planets and the icy moons will be comprehensively discussed. Toward future exploration missions, we'd like to promote the study of giant planetary systems, and also progress in developing a solar sail mission to observe Jovian system and Trojan asteroids will be discussed.

5:50 PM - 6:00 PM

[PPS01-P01_PG]Submillimeter-Wave Instrument (SWI) for JUICE: Current Status of the Instrumental Development

3-min talk in an oral session

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The Submillimetre-Wave Instrument (SWI) is a passive submillimeter-wave heterodyne instrument proposed as one of the scientific payload instruments for the Jupiter Icy Moons Explorer (JUICE) mission. It measures the thermal emission from atmosphere of Jupiter and its moons at the frequency region of 500 - 600 GHz (with keeping 1200 GHz range as an optional concept). Thermal emission from the surface of moons will also be measured. JUICE/SWI provides unique observational data for characterization of the Jovian stratosphere such as thermal structure, dynamics, and distribution of minor species; and for exploration of tenuous-atmosphere and surface environment of the Jovian moons. By detecting hydrogen and oxygen isotopes in the water vapor of Jovian moons' atmosphere, SWI can also contribute to understanding the origin and distribution of water in our solar system. This paper presents the current status of the development of SWI instrument, including the updates on the science targets and their feasibility studies. The SWI instrument is being developed through international cooperation. The Japanese team contributes to the development of the submillimeter reflector (mirror). The submillimeter reflector is one of the key components of SWI, and it determines the spatial resolution of observations. Currently a 30-cm aperture diameter reflector is considered, providing a spatial resolution of 2 mrad (FWHM) at 600 GHz. In order to fulfill the stringent requirement of weight reduction, we evaluated the

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material of the reflector and optimized its rib structure. The side lobe suppression is also an important factor to improve the quality of observations.

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