
 Oral | Symbol U (Union) | Union

[U-06_28AM1] New Progress toward the Understanding of Small Solar System Bodies

Convener: *Masahiko Arakawa (Graduate School of Science, Kobe University), Taishi Nakamoto (Tokyo Institute of Technology), Sei-ichiro WATANABE (Division of Earth and Planetary Sciences, Graduate School of Science, Nagoya University), Masanao Abe (Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency), MASATERU ISHIGURO (Department of Physics and Astronomy, Seoul National University), Chair: Masahiko Arakawa (Graduate School of Science, Kobe University)

Mon. Apr 28, 2014 9:00 AM - 10:45 AM 503 (5F)

This session is aimed at setting up a forum to discuss how we can make progresses in our understanding of the solar system evolution with our hands on data. Presentations related to the science of the small bodies in the solar system (satellites, asteroids, comets, interplanetary dust particles, trans-Neptunian objects, and planetesimals) are invited. In addition to the extensive astronomical/remote-sensing observations and theoretical works, Hayabusa has brought us samples back from Itokawa (S-type asteroid) for unprecedentedly detailed analysis. The results of the Hayabusa sample initial analysis do prove that analysis of returned samples will play a key role in our future study of the solar system evolution. While the mission preparation of Hayabusa2, which is targeted at a more primordial asteroid than Itokawa (1999JU3, C-type), is being matured, expectation of building a new gateway to biology-flavored topics via organic material and aqueous alteration analysis is ramping up. In this session, after summarizing the cutting-edge results obtained by various studies, including the impact physics important for the asteroid evolution, we will discuss the future shape of the study of the solar system evolution.

10:30 AM - 10:45 AM

[U06-P02_PG] Observation of geometric albedo of the C-type asteroid by the laser altimeter on Hayabusa-2 spacecraft

3-min talk in an oral session

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The Japanese asteroid explorer 'Hayabusa2' will be launched at end of 2014, and it will probe the near-Earth C-type asteroid '1999JU3'. In this mission, we have a plan to utilize the laser altimeter (LIDAR) to investigate the distribution of geometric albedo of 1999JU3 at laser wavelength (1064 nm). The LIDAR on-board Hayabusa2 has functions to measure the intensities of sending laser pulse and receiving laser pulse reflected from the asteroid surface in addition to measurement of distance between the spacecraft and the asteroid. We can evaluate the geometric albedo of the 1999JU3 using the measured intensities of sending and receiving pulses. In this presentation, we will indicate results of the performance tests of the LIDAR and expected accuracy of the albedo evaluated from the results of the tests. We will also describe not only effect of characteristic of the LIDAR but also effects of inclination and roughness of the asteroid surface on estimation of the albedo. In our study, three types of scientific topics using information of the albedo on asteroid surface estimated from the LIDAR data with other

equipment data are considered; they are (1) rock and mineral category of 1999JU3, (2) degree of water content on asteroid surface and (3) variation of asteroid surface caused from space weathering and/or exterior material. We will report prospects to obtain information about these science topics applying the LIDAR which has our evaluated performance.