[EE] Evening Poster | P (Space and Planetary Sciences) | P-PS Planetary Sciences

[P-PS02]Regolith Science

convener:Koji Wada(Planetary Exploration Research Center, Chiba Institute of Technology), Akiko Nakamura(Graduate School of Science, Kobe University), Patrick Michel(共同), Kevin John Walsh (Southwest Research Institute Boulder)
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Recent planetary explorations have revealed that almost all solid bodies in the solar system are covered with small particles, called regolith. The surface geology, especially regolith behavior on the surfaces of solid bodies, becomes increasingly more important as represented by Hayabusa mission and other on-going and planned sample-return missions such as Hayabusa2 going to an asteroid Ryugu, OSIRIS-REx going to an asteroid Bennu and MMX planning to go to the martian satellites.

For fully understanding the regolith science, it is required to know and compare the regolith conditions on various celestial bodies, from asteroids to planets, with various methods.

Therefore, this session welcomes broad topics related to regolith on various celestial bodies, such as asteroids, comets, the Moon, the martian moons, Mars, etc. Papers on the formation, evolution, and alteration processes of regolith particles and regolith systems on the surface of planetary bodies, remote and in-situ observational results and techniques, analyses and results of returned samples, and laboratory, numerical, and theoretical studies on the fundamental physical and chemical processes are all welcome.

[PPS02-P06]Apparent temperature profile of rough surface observed by TIR on board Hayabusa2

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TIR is the thermal infrared imager onboard Hayabusa2, a Japanese asteroid exploration mission. It takes the 2D image of the brightness temperature distribution on the target asteroid Ryugu. Hayabusa2 will stay at so-called "home-position" which is on the line between Ryugu and Earth and 20 km above Ryugu, resulting almost constant solar phase angle in a short time scale. The observation of apparent temperature at a constant phase angle might mislead the thermos-physical parameter such as thermal inertia because it is known that the apparent temperature of a rough surface depends on the observation angle.

To evaluate the effect of the surface roughness on the apparent temperature, we conducted a numerical model on the rotational thermal evolution of a roughness, and TIR images are simulated by using the result of the numerical model. In the real operation of Hayabysa2 mission beginning in this summer, we will be able to evaluate the surface roughness by comparison of the real TIR image and the simulated TIR images for various roughness parameters.