

Measuring Albedo of C-type Asteroid with LIDAR onboard HAYABUSA2 Spacecraft

Shinsuke Abe^{1*}, Fumi Yoshida², Hiroতোমো Noda², Ryuhei Yamada², Sho Sasaki², Noriyuki Namiki³

¹Department of Aerospace Engineering, College of Science and Technology, Nihon University, ²National Astronomical Observatory of Japan, ³Planetary Exploration Research Center, Chiba Institute of Technology

Hayabusa-2 is an asteroid sample return mission of JAXA/ISAS (Japan Aerospace eXploration Agency/Institute of Space and Astronautical Sciences) which will be launched in 2014, will explore a near-Earth asteroid (162173) *1999 JU3* in 2018, and will back to the Earth in 2020. LIDAR (laser altimeter) is one of five instruments onboard *Hayabusa-2*, and is used to measure distance between the spacecraft and the surface of the target asteroid. LASER pulse measuring from 25km to 30 m distances emits at the wavelength of 1.06 micron. LIDAR will be used as not only navigation instrument on the spacecraft but also scientific experiments such as measuring local landscape, albedo, dusts, gravity and shape of the asteroid.

Considering ground-based spectroscopic & lightcurve observations of *1999 JU3*, other C-complex main-belt asteroids, and laboratory experiments of carbonaceous chondrites, several science topics related to albedo of C-type asteroid obtained by LIDAR and other instruments onboard *Hayabusa-2* will be discussed. For example, surface albedo heterogeneity, space weathering, and associated main-belt asteroid families. Albedo heterogeneity of S-type asteroid Itokawa obtained by LIDAR and NIRS (Near-InfRared Spectrograph) on *Hayabusa-1* will be shown.

Keywords: asteroids, Hayabusa, LIDAR, albedo, space weathering, carbonaceous chondrites