

## Detection of dust around 1999JU3 using Hayabusa-2 LIDAR

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The surface of an airless object suffers from bombardments of micrometeoroids. The bombardments produce small fragments, or dust grains, on and around the surface of the object. Dust grains on the surface could be ejected from the surface due to some reasons such as seismic shaking, another impact, electric repulsion, etc. Lateral transport of dust particles at the surface of the object is likely very important for formation of local morphology. Also, vertical transport of dust is critical for interpretation of irradiation age of cometary rays and implantation of solar wind elements which could constrain orbital evolution of the object. We are planning to detect dusts around the target object of Hayabusa-2 mission, 1999JU3, by using Hayabusa-2 LIDAR.

Hayabusa-2 LIDAR is one of four remote sensing instruments onboard Hayabusa-2. It measures distance between the spacecraft and a target by taking a time of flight of LASER pulse. The threshold level in optical receiver changes in 8 steps. Dust grains with radius of ten micron meters and spatial density of a few grains per cc is expected to be detected from an altitude of 20km (Hayabusa-2 home position), but it depends not only on the physical properties of dust grains but also on sensitivity of receivers for faint signal. Thus we need to verify the performance of dust detection mode of Hayabusa-2 LIDAR.

We develop a new device which simulates a faint reflected light from dust clouds. When a trigger signal is received, it irradiates LASER with a pre-programmed pattern. The time resolution of the pattern is ten nano seconds and energy changes in 7 steps. The maximum energy of LASER is adjusted by using ND-filter.

In this presentation we will present a strategy to verify the performance of dust detection mode of Hayabusa-2 LIDAR, and discuss the possibility of dust detection around 1999JU3.

Keywords: dust, LIDAR, Hayabusa-2