

Thermal Emission Observation of Asteroid Itokawa in Hayabusa and A Plan of Thermal Imagery in Hayabusa-2

TATSUAKI OKADA¹, and THERMAL EMISSION GROUP of HAYABUSA-2

¹*Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency*

In Hayabusa, the thermal emission from the asteroid is observed with the temperature profile of well calibrated radiator of X-ray spectrometer, because no thermal radiation detector was carried on the spacecraft. It clearly detected the thermal radiation change as temperature profile according to the elongated asteroid rotation. During the descent phase for sampling, the temperature growth was also measured. Consequently we obtain the typical surface temperature of S-class asteroid Itokawa is $330\pm 10\text{K}$ at equator and $310\pm 10\text{K}$ at high latitude area. The thermal inertia is in the range 500 to 1000, which means that most of the surface is covered with pebbles to rocks.

In Hayabusa-2, the target asteroid is a C-class asteroid 1999JU3 and the surface physical condition or porosity is much more important. Therefore, we have a plan to image the asteroid with a mid-infrared imager for thermal emission distribution. Hayabusa-2 is an immediate follow-on mission and have very short period of time to prepare for. Thus the instrument is based on the LIR (long-wavelength Infrared Imager) for Akatsuki (Planet-C) and with adjustment for higher temperature observation as well as multi-band function for materials determination. The current status of this instrument is shown.