

Development of MASCOT (Mobile Asteroid Surface Scout) small lander on Hayabusa2

Tatsuaki Okada^{1*}, HO, Tra-Mi², MASCOT team²

¹Institute of Space and Astronautical Science, JAXA, ²German Aerospace Center

The small lander MASCOT (Mobile Asteroid Surface Scout) is being developed for HAYABUSA2 under the international collaboration among DLR (Germany), CNES (France), and JAXA (Japan). It aims to investigate with high accuracy and spatial resolution the surface geomorphology, the minute structure, texture and composition of rocks, and the thermal and magnetic properties of C-class asteroid. Characteristics and status of the lander is briefly reported.

MASCOT has been tested for its performance, functions, and tolerance under mechanical and thermal-vacuum environmental conditions using Engineering model. It has been verified in component tests as well as initial integration test of Hayabusa2.

A 10kg-class lander is being considered with 3kg for science instruments. A wide angle multi-band imager CAM and a visible-infrared hyperspectral Microscope MicrOmega, multi-wavelength thermal radiator MARA, and fluxgate magnetometer MAG are the science payloads. With these instruments, the lander will conduct its stand-alone surface science of geology and geophysics, obtain geologic context for sample return, and measure composition and mineralogy as groundtruth for remote sensing. The lander will strengthen and complete the science of HAYABUSA-2 complementary to remote sensing and analysis of returned samples.

Keywords: Hayabusa2, asteroid, lander, hyperspectral microscope, thermal radiometer