

SPACE EXPLORATION SYMPOSIUM (A3)
Small Bodies Missions and Technologies (4)

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THE FINAL DEVELOPMENT STAGES OF MASCOT, A SMALL ASTEROID LANDER TO
ACCOMPANY HAYABUSA-II

Abstract

The Memorandum of Understanding signed between the Japanese Aerospace Exploration Agency (JAXA) and the German Aerospace Centre (DLR) during the 63rd International Astronautical Congress (IAC) in Naples, paves the way for the Mobile Asteroid Surface Scout (MASCOT) participation in JAXA's Hayabusa-II mission. Like its famous predecessor, Hayabusa-II is foreseen to study and return samples from a Near-Earth Asteroid. In contrast to the previous mission, Hayabusa-II will also include a small

lander package being developed by DLR and the Centre National d'Etudes Spatiales (CNES): the aforementioned MASCOT. Scheduled for a launch in 2014, Hayabusa-II journey will take 4 years until it will arrive at 1999JU3, a C-type asteroid. Following the initial remote sensing operations, MASCOT will be released to the surface and perform its science operations at its first location. Once this is complete, MASCOT will be able to 'hop' from one measurement site to the next. The payload suite will comprise a spectrometer (MicrOmega, IAS Paris), a camera (MERLIN, DLR Berlin), a radiometer (MARA, DLR Berlin) and a magnetometer (MAG, TU Braunschweig). Realizing MASCOT's mission is difficult due to the strict mission requirements, the harsh landing environment and a short development time for a piggy-back deep space mission. Aiming for high performance and reliability requires creative design solutions and novel developments in order to meet all challenges and to stay inside the mass limit of 11 kg. The status of MASCOT up to end of Phase B was presented at the 63rd IAC. With a flight model delivery scheduled for February 2014, the mission is now in the final stage of development and testing. The results of these tests have shown the strict limits of the structure and thermal design, and highlighted the risk in such a short project development. Lessons have also been learned regarding margin policy for such small spacecraft. Despite these challenges, the project is on-track, with all delivery milestones expected to be met. These last few months will serve to verify all of the design assumptions, before the launch in late 2014.