

IAF SPACE EXPLORATION SYMPOSIUM (A3)
Small Bodies Missions and Technologies (Part 2) (4B)

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THE ROVER FOR THE JAXA MMX MISSION: A STATUS

Abstract

In the frame of the JAXA's MMX (Martian Moons Explorer) mission, performing remote sensing science as well as sample return from the surface of Phobos, CNES and DLR have decided to develop a rover that will be delivered to the surface of Phobos. The MMX mission will be launched in September 2024 and the rover operations are foreseen for 2026-2027.

This 25 kg rover will be both a scout (mitigating the risk of the mission by being the first to contact the surface of Phobos), a demonstrator (it will validate the low-g locomotion and demonstrate the capability of nanosats components in interplanetary missions) and an explorer (it will perform in-situ science).

It will be fitted with four instruments :

- NavCAM (Navigation Cameras): a pair of cameras that will be used for navigation, but also for landscape imaging and context information.
- WheelCAM: a pair of cameras in order to characterize the regolith mechanical properties by looking at its interactions with the rover's wheels.
- RAX (Raman Spectrometer for MMX): a compact instrument that will perform Raman spectroscopic measurements to identify the mineralogy of the Phobos surface.

- miniRAD (mini Radiometer): a radiometer that will measure the radiometric flux emitted from the Phobos' surface in 6 different infrared bands in order to get information on the ground thermo-physical properties.

The rover will be delivered to the surface from low altitude by the MMX spacecraft, and will autonomously upright and deploy itself from a stowed position. Then, it will operate for a nominal duration of 3 months.

After giving an overview of the mission and its objectives, the paper will focus on the rover design, its instruments, and the development status.