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MISSION DEFINITION OF MARTIAN MOONS EXPLORATION (MMX)

Abstract

Martian Moons eXploration (MMX) is a mission under study in ISAS/JAXA to be launched in 2024. This paper introduces the mission definition and the latest status of MMX program.

"How was water delivered to rocky planets and enabled the habitability of the solar system?" This is the key question to which MMX is going to answer. Solar system formation theories suggest that small bodies as comets and asteroids were delivery capsules of water, volatiles, organic compounds etc. from outside the snow line to entitle the rocky planet region to be habitable. Mars was at the gateway position to witness the process, which naturally leads us to explore two Martian moons, Phobos and Deimos, to answer to the key question.

The goal of MMX is to reveal the origin of the Martian moons, and then to make a progress in our understanding of planetary system formation and of primordial material transport around the border between the inner- and the outer-part of the early solar system. The mission is to survey two Martian moons, and return samples from one of them.

Following the mission design study results presented in the previous conference, the following items will be reported in this conference. First, Phase-A study of the mission finally complete in the Spring this year, and the latest definition of the spacecraft system, key mission instruments, baseline operation plan, are presented. Second, the list of mission payloads, including non-scientific objective ones, are finally determined and presented. And third, the programmatic framework including the science promotion and international collaboration are defined and presented. The details will be shown in the paper.