

PPS001-01

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MELOS火星探査ミッションの概要

Mars Exploration Mission MELOS: An Overview

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In 2009, the working group continued discussion on selection of the scientific target and effective approach for Japan's Mars exploration mission. An idea is shared by the WG members that it is essential to understand how the system(the solid planet, the surface, the atmosphere, and the space environment) works. For decades of time, there have been numerous Mars exploration missions and what is being missed to date is description of the entire Martian system. This motivated us to plan a mission that includes both orbiting and landing investigation of the system. The new Mars mission is thus named MELOS which is an abbreviation of "Mars Exploration with Lander-Orbiter Synergy".

The orbiter's main target is Martian meteorology. Venus Climate Orbiter, now named "Akatsuki", will study unique meteorological system on Venus. To complete our understandings on meteorology of terrestrial planets, Mars is going to be the target after Venus. The orbiter will carry "Akatsuki"-based imagers (visible and near-infrared), a sub-millimeter sounder, a limb-sounding high-dispersion spectrometer, plus a ultra-stable oscillator for radio occultation study. A total of 60-kg science payload is anticipated. The orbital period of approximately 9 hours allows us to monitor the same region for hours of time (like a view from geostational meteorological satellite) when the spacecraft is near the apocenter.

The orbiter will also act as a service module for the lander(s), of which weight may be up to 500 kg including the entry system. The type of lander and scientific target is still under discussion. A preliminary system analysis is being carried out and we have found that it is possible to realize such a mission by utilizing the capability of H-IIA rocket with 2 solid-propellant boosters plus a 3rd stage motor. We wish to launch MELOS in the 2018 window so it is possible to perform coordinated investigation with NASA's MAVEN (launch in 2013) and with NASA-ESA's 2018 orbiter (will be a "trace gas" mission). An overview of mission planning, as well as the instruments under consideration, will be presented.

キーワード:火星,探査,大気,周回機,着陸機

Keywords: Mars, Exploration, Atmosphere, Orbiter, Lander