

## Science Lander System for Mars Exploration Mission MELOS

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<http://planetb.sci.isas.jaxa.jp>

Science exploration using the first Japanese Mars lander is under study in the MELOS mission. It aims at understanding the change of past to present surface environment and the possible process of huge atmospheric escape by a stand-alone station as well as a cooperative observation with orbiters. Here the current studies of lander system for MELOS are briefly reported.

MELOS surface lander(s) will carry out (1) the precise measurement of molecular and isotopic composition of martian atmosphere and its seasonal variation (mass spectrometry), (2) interior structure and dynamics to investigate thermal history and circulation of materials (seismology, MT, heat flow, VLBI), (3) chronology of materials and aging of martian geologic activity (K-Ar: XRF, mass spectrometry), (4) precise measurement and microscopic observation to understand surface evolution processes (VNIR spectroscopy, imaging, XRD), (5) ground monitoring the meteorology and surface to atmospheric phenomena.

In this study, lander system is investigated to achieve the science goal.

One, two, or three lander(s) system is comparatively studied. The lander(s) will descend to the surface after orbiting the Mars, which is required to widen the area for candidate landing sites and land the target site precisely.

After landing, the lander will start its experiments. Some experiments finishes soon but others lasts for at least one Mars year. Initial study for power supply unit and thermal design is considered for long-lived station as well as the communication and data handling system is investigated to optimize the instrumental operation within telemetry for maximizing the science return. Methods of instrumental setups are also being considered for seismometer, magnetometer, or sampling system.