Observation of Mars in MMX mission

*Takeshi Imamura[1], Kazunori Ogohara[2], Yasumasa Kasaba[3], Shohei Aoki[6], Makoto Taguchi[4], Shingo Kameda[4], Ichiro Yoshikawa[5]

1.Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency, 2.Prefecture School of Engineering, The University of Shiga, 3.Department of Geophysics, Graduate School of Science, Tohoku University, 4.College of Science, Rikkyo University, 5.Department of Complexity Science and Engineering, The University of Tokyo, 6.Istituto di Astrofisica e Planetologia Spaziali, Istituto Nazionale di AstroFisica

To understand the water cycle and reservoir stability on Mars, investigation of localized water vapor transport and the diurnal cycle of phase change are important. Information obtained so far is quite limited because previous observations from polar, low-altitude orbiters did not obtain snapshots of high-resolution water vapor distribution and did not observe formation/evaporation of localized clouds. To understand dust lifting and the formation of global-scale dust distribution, investigation of fast, localized dust storms is important. Previous observations did not detect temporal development such events.
Observations of the Martian atmosphere in MMX from a high orbit will achieve a breakthrough via continuous, high-resolution global monitoring of dust, clouds, water vapor, and minor gases. The candidate instruments are mapping spectrometers in near-IR and UV, visible camera, and thermal IR camera. The expected outcomes are: spatial distribution of water vapor at fine scales; how water vapor emerges at specific locations, flows over long distances, and forms clouds; location, local time, and timescale of localized dust lifting; and how the lifted dust clouds spread and become diffuse.

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