Observation of Mars in MMX mission

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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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