Vertical Distributions and Transports of Water Vapor and H_2O/CO_2 Ice Particles in the Martian Atmosphere: Comparison between Recent Observations and a General Circulation Model

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The Mars Climate Sounder onboard the Mars Reconnaissance Orbiter inserted into Mars orbit in 2006 and the first detections of the vertical distributions of dust and water ice have been done from the data [1]. Detailed vertical distributions of water vapor in the Martian atmosphere are to be observed by the HIFI and PACS onboard the Herschel space observatory [2,3]. Moreover, OMEGA onboard the Mars Express has observed the CO_2 ice particles in 60-80 km height above the equatorial region [4]. Because the materials should be transported by the Hadley cells depending on the heights they exist, observations of the vertical distributions of them should provide significant information for the climate change on Mars. In this presentation we examine the seasonal changes of vertical distributions and transports of the water vapor and H_2O/CO_2 ice particles using our general circulation model DRAMATIC (Dynamics, RAdiation, MAterial Transport and InteraCtions between them; formerly called as CCSR/NIES/FRCGC) MGCM, compare the numerical results with the recent observations, and discuss what future observations are required, including the MELOS SMM Sounder.

References

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