Modeling the Atmospheric Water Cycle with a Martian General Circulation Model

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Despite being a minor constituent, water plays a major role in the atmospheric photochemistry on Mars. We investigate the Martian water cycle using a three-dimensional general circulation model (GCM). The updated version of the MAOAM GCM is currently based on a new spectral dynamical core. The simulated water cycle accounts for all main processes relevant to Martian conditions: condensation, sublimation, sedimentation of ice particles, advective and diffusive transport of water vapor and ice. The implementation of a microphysical scheme allows us to infer more accurately ice particle sizes that vary with locations. Simulated seasonal variations are compared with available Martian observations. Particular attention is paid to the behavior of water vapor during major dust storms.