

I discuss measurements of water vapor in the Martian atmosphere with two different techniques: Limb-viewing from orbit with the Thermal Emission Spectrometer (TES) on the Mars Global Surveyor spacecraft, and observations of the sky as seen from the planet surface with the ChemCam spectrometer on the Mars Science Laboratory (“Curiosity”) Rover. These observations address long standing open questions about the Martian water cycle, specifically: What is the vertical profile of water vapor in the lower atmosphere? and To what extent does water vapor in the Martian atmosphere interact with the regolith? The TES limb-viewing approach for water vapor is a work-in-progress at the present time, although it does yield some interesting preliminary vertical profiles. The ChemCam passive sky technique is however quite mature for water vapor and has important implications for the nature of the Martian water cycle.