WATER VAPOR PROFILING FROM ABSORPTIVE OCCULTATION MEASUREMENTS

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The retrieval of water vapor vertical profiles from two different occultation systems will be discussed and compared. One is based on solar occultation measurements taken in the 930 - 960 nm near infrared region by the Statospheric Aerosol and Gas Experiment (SAGE) III instrument. SAGE III has been collecting data since February 2002, thus both simulations and real inversion results will be presented. The other is based on a proposed radio occultation system referred to as the Active Tropospheric Ozone and Moisture Sounder (ATOMS). The ATOMS water vapor retrieval is based on measurements taken near the 22 and 183 GHz water lines.

An overview of the two occultation systems will be presented to point out their relative strengths and weaknesses for the retrieval of water vapor vertical profiles. Forward simulations performed for several atmospheric test cases are used to study the sensitivity of the measurements to the water vapor content as a function of altitude. Finally, the corresponding inversion methodologies and simulated retrievals of water vapor profiles will be presented and compared. The comparisons will include rough error analyses, e.g., sensitivity to measurement uncertainty and forward model assumptions, as well as the computer processing time required for the inversion algorithms.