

Inter-instrument comparisons of tropospheric water vapor over land and oceans

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Characterizing the tropospheric water vapor is of profound importance in weather and climate studies. Significant new techniques are now being developed that highlight the combined power of the Global Positioning System radio occultation (GPSRO) measurements with passive sounding techniques in retrieving the Earth's thermodynamic parameters. We will describe our efforts to improve characterization of the tropospheric water vapor by combining GPSRO refractivities with temperatures from the Atmospheric Infrared Sounder (AIRS) instrument. The statistical differences among the GPS-derived, the AIRS and the NCEP/NCAR water vapor profiles will investigate the complementary nature of active and passive sounding techniques. Our goal is to explore and expand on the retrieval process of water vapor profiles under cloudy conditions over both land and ocean regions, emphasizing the vertical variability of the water vapor differences among the retrieved water vapor profiles. Our research results will demonstrate the importance of the GPSRO technique as a remote sensing tool in the context of climate research.