

Abstract Submitted
for the SES08 Meeting of
The American Physical Society

Comparison of Water Vapor Measurements from GPS Atmospheric Remote Sensing Techniques IAN C. COLON-PAGAN, University Center for Atmospheric Research (UCAR)/Significant Opportunities for Atmospheric Research and Science (SOARS) Program, BILL KUO, National Center for Atmospheric Research (NCAR)/Constellation Observing System for Meteorology, Ionosphere, and Climate (COSMIC) Center, COSMIC TEAM — In this study, we compare precipitable water vapor (PWV) values from two different observing techniques over the Caribbean Sea, Gulf of Mexico, and U.S. regions, including ground-based GPS water vapor sensing and COSMIC radio occultation (RO) measurements, as well as global analyses from NCEP and ECMWF models. The PWV values estimated by ground-based GPS receivers tend to have a slight dry bias for low PWV values and a slight wet bias for higher PWV values, when compared with space-based techniques. This may be a consequence of missing low altitude data from RO in areas where the water vapor is concentrated, locations of the RO soundings with respect to ground-based stations, or simply the difference of these two measurement techniques. A student T-test application gives a retrieved t-value of 2.35, which is larger than the sample's critical value, 1.96. This means there is a significant difference between both GPS techniques datasets with a 0.01% chance of observing a difference as large as it was observed in other random samples.

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Date submitted: 15 Aug 2008

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