

Abstract Submitted
for the SES08 Meeting of
The American Physical Society

Comparison of Water Vapor Measurements from Ground-based and Space-based GPS Atmospheric Remote Sensing Techniques IAN COLON-PAGAN, N. C. A&T State University, YING-HWA KUO, National Center for Atmospheric Research — In this study, we compare precipitable water vapor (PWV) values from ground-based GPS water vapor sensing and COSMIC radio occultation (RO) measurements over the Caribbean Sea, Gulf of Mexico, and United States regions as well as global analyses from NCEP and ECMWF models. The results show good overall agreement; however, 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 GPS RO measurements and global analyses. An application of a student T-test indicates that there is a significant difference between both ground- and space-based GPS measured datasets. The dry bias associated with space-based GPS is attributed to the missing low altitude data, where the concentration of water vapor is large. The close agreements between space-based and global analyses are due to the fact that these global analyses assimilate space-based GPS RO data from COSMIC, and the retrieval of water vapor profiles from space-based technique requires the use of global analyses as the first guess. This work is supported by UCAR SOARS and a grant from the National Oceanic and Atmospheric Administration, Educational Partnership Program under the cooperative agreement NA06OAR4810187.

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Date submitted: 18 Aug 2008

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