



## **Assessment of the Quality of Radiosonde Temperature and Water Vapor Measurements using GPS Radio Occultation from COSMIC**

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The Global Positioning System (GPS) radio occultation (RO) is the first technique that can provide all-weather high vertical resolution refractivity profile. To see if GPS RO refractivity at lower troposphere is of sufficient accuracy to differentiate the performance of different types of radiosonde, we compare refractivity profiles from FORMOSAT-3/Constellation Observing System for Meteorology, Ionosphere, and Climate mission (COSMIC) occurred within 2 hours and 300 km with refractivity profiles from different types of radiosonde over four geographical areas during the period from September 2006 through December 2006. The derived temperature and water vapor profiles from COSMIC are also compared with those obtained from collocated radiosonde soundings and European Centre for Medium Range Weather Forecasts (ECMWF) analysis. The results indicate that because the quality of RO soundings is independent of geographical location, COSMIC RO data is very useful to distinguish the quality of different types of radiosonde systems. In addition, because RO refractivity is very sensitive to water vapor variation especially near the lower troposphere, with reasonable independent temperature profiles, we can have high accurate water vapor profiles. This is demonstrated in the global comparison between COSMIC water vapor profiles and water vapor profiles from radiosonde soundings and ECMWF analysis.