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Poster
Accurate and consistent water vapor measurements in the troposphere are critical for studying the water vapor feedback on clouds and hydrological cycles. Radiosondes have provided long-term and all-weather in situ operational measurements of atmospheric humidity measurements for decades. However, due to the lack of benchmark humidity references, it is very difficult to quantify the possible geographically and temporally dependent errors. In this study, we used water vapor (WV) profiles derived from Constellation Observing System for Meteorology, Ionosphere, and Climate (COSMIC) measurements to assess the humidity measurements over lands from different types of radiosonde from June 2006 to December 2016. To test whether COSMIC WV can reasonably identify known radiosonde moisture bias for different sensor types, the COSMIC-radiosonde pairs are grouped into different sensor types. European Centre for Medium Range Forecasts (ECMWF) analysis interpolated onto the locations and times of COSMIC data are also compared. Comparisons show that COSMIC specific humidity data agree well with ECMWF analysis over different regions of the world for both day and night times. On the contrary, obvious mean WV biases are found for COSMIC-sonde pairs for different water vapor sensor types. These results demonstrate the usefulness of COSMIC water vapor for quantifying the dry/wet biases among different sensor types.
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