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Poster
Histograms of humidity are useful for understanding the hydrological cycle because of the information they provide about the full range of behavior including the extremes where cloud and precipitation form. Measuring histograms accurately is quite challenging because it requires a combination of precision, accuracy, resolution and complete coverage through all weather conditions and over all types of surfaces throughout the diurnal and seasonal cycles that is quite difficult to achieve observationally.

We have developed an approach to deconvolving errors from GPS-derived humidity histograms that eliminates the background water vapor guess which minimizes reliance on and influence of models. With this approach GNSS RO appears to yield the best histograms of the low latitude, free tropospheric moisture.

We will address several points in this talk.
• The uncertainty in the GPS RO histograms after deconvolution.
• The structural uncertainty of radiance measurements implied by the spread in histograms from various NWP analyses and AIRS Level 3 results.
• The spread across the histogram estimates is larger than the natural variability.
• We conclude that observational constraints from present observing systems are not sufficient to reduce the climate prediction uncertainty tied to boundary layer clouds which account for nearly 50% of the variance in the spread in climate predictions.
OSTS session
Regional and Global CAL/VAL for Assembling a Climate Data Record
Meeting name
Joint COSMIC Tenth Data Users' Workshop and IROWG-6 Meeting
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