Utility of a GPS Radio Occultation and Hyperspectral Infrared Sounder Matchup Dataset: Independent Comparisons

Michelle Feltz 1, Robert Knuteson

1University of Wisconsin – Madison, Cooperative Institute for Meteorological Satellite Studies
2Space Science and Engineering Center

GPS radio occultation (RO), due to its stability and measurement principle that is fundamentally different from that of radiometric instruments, can offer an independent dataset for comparison against radiometric sounding retrievals, unlike models fields that ingest satellite data. Unlike the radiosonde network, which has been traditionally used for sounder validation purposes, GPS RO is unbiased to have more samples over land or ocean, has a more continuous temporal and spatial range, and provides more coverage in the upper troposphere and lower stratosphere. By spatiotemporally matching individual GPS RO profiles to sounder profiles from different instruments and platforms, various comparisons of sounder retrieval products and GPS RO products can be made. Temperature profile comparisons involving NASA AIRS version 5 and 6, IDPS CrIMSS, NOAA IASI, CDAAC COSMIC, and CDAAC GRAS for a global and 5 latitude zones have been made, and are being extended to include EUMETSAT IASI and NUCAAPS CrIMSS. Advancement from previous work includes the use of averaging kernels to account for the differing vertical resolution of the sounder and GPS RO profiles. Preliminary results from the averaging kernel application to the sounder minus GPS RO temperatures are shown.