New Radiosonde temperature bias adjustments for potential NWP applications based on GPS RO data

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Revised Radiosonde (RAOB) temperature bias adjustments for potential weather forecast assimilation based on COSMIC GPS RO data are under development and testing in a coordinated effort involving NOAA Center for Satellite Application and Research (STAR), Air Resources Laboratory (ARL) and National Center for Environmental Prediction (NCEP).

The UCAR COSMIC near-real-time product has been routinely ingested into NOAA Products Validation System (NPROVS) operated at STAR since early 2008. The use of COSMIC temperature profiles as a ground-truth to inter-compare RAOB and satellite sounding characteristic performance from a variety of operational polar and GOES satellite platforms has shown high value. More specifically, Sun et al. (2013) demonstrates that the COSMIC dry temperature profile provides a good estimate of mean radiation induced temperature bias for respective RAOB instrument types as flown in the global operational upper air network of the World Meteorological Organization (WMO). Efforts to update NCEP radiation correction (RADCOR) adjustment tables based on that study and comparison results against existing (and outdated) RADCOR based on preliminary NCEP data assimilation experiments are shown; results are highly encouraging.

Future plans to update the RADCOR adjustment tables based on data after 2012 and to ultimately implement in NCEP operational GFS are presented. Ensuing coordination with GCOS Global Reference Upper Air Network (GRUAN) activities to utilize COSMIC (and other GPSRO) for improved radiation adjustment of reference RAOB is also discussed.