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the validation of FORMOSAT-3/COSMIC atmospheric retrieval profile with high-resolution in-situ sounding data

P.-H. LIN

Deptartment of Atmospheric Sciences, National Taiwan University,Taipei, Taiwan (polin@ntu.edu.tw)

This study collected the high-resolution data of dropsonde, balloon radiosonde as well as MIST-sonde of driftsonde system during SoMWEX 2008, DOTSATR 2008 and THORPEX/PARC 2008. These in-situ atmospheric sounding data from the same temperature/humidity sensor, Vaisala RS92-PTU module, in these weather experiments around western Pacific and Taiwan region provide the unique reference for comparing FORMOSAT-3/COSMIC temperature and humidity profiles. FORMOSAT-3/COSMIC, similar to CHAMP GPS radio occultation soundings, was launched in 2006 and had provided global coverage of temperature and humidity profiles for numerical weather prediction. The near geo-location (less than 200 km radius) and near synchronized time window (less than 2 hours) are the matching conditions to compare the remote and in-situ profiles with 100 m vertical resolution from surface to upper air. 51 pairs of comparison showed that FORMOSAT-3/COSMIC has -0.06±0.88 [U+2103] cold bias (0.53±3.34 [U+2103] warm bias) below (above) 10 km height. The humidity profile has dry bias from -0.38 to -0.07 g/kg from lower atmosphere to higher altitude.The averaged slant distance (1̃30km) from FORMOSAT-3/COSMIC might cause the lager deviation on moisture profile to the near-vertical in-situ radio soundings.