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Validation of Brightness Temperatures observed by SAPHIR instrument onboard Megha-Tropiques Satellite : focus on the Cindy Dynamo campaign.

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The Megha-Tropiques (MT) satellite was launched in October 2011 with the aim to document water and energy budgets in the tropics at appopriate scales. The SAPHIR (Sondeur Atmosphérique du Profil d'Humidité Intertropicale par Radiométrie) instrument onboard Meghatropiques sounds the atmosphere with 6 channels near the 183 GHz water vapour absorption band with cross track scanning and a resolution of 10km at nadir.
This work focuses on the evaluation of SAPHIR observed brightness temperatures with regards to reference observations, specifically those performed during the Cindy Dynamo and a dedicated Megha Tropiques campaigns. The validation of SAPHIR instrument is based in priority on the use of water vapour observations performed at tropical sites by Vaïsala RS92 sondes as reference data. This type of sonde is widely used in the community and its upper tropospheric dry bias features are well known and corrected. A dedicated sounding campaign has been performed in Ouagadougou, Burkina Faso in 2012 by the MT validation team, including four weeks shared between dry and wet seasons, June and July respectively. In addition to this dedicated MT campaign and to operational networks (IGRA, ARM, GRUAN), the data are mainly collected from the CINDY DYNAMO observation campaign during which several thousand high resolution soundings have been performed in a network of land sites (GAN, Darwin, Nauru...) and scientific ships (Mirai, Baruna, Roger Revelle)
The water vapour observations from the dedicated campaign in Burkina Faso and those performed during Cindy Dynamo campaign undergo the same quality control procedure with ASPEN software, and the same Vaïsala RS92 dry bias correction which was developped by the GRUAN community. The quality checked and bias corrected water vapour profiles are then used to simulate brightness temperatures with RTTOV 10 radiative transfer model. The RTTOV model output are then compared to collocated SAPHIR observations at the closest pixel in a 90 minutes interval around radiosounding launch time. The possible reasons for bias and dispersion observed in the RTTOV modelled brightness temperatures are investigated and will be discussed.