

Using TRMM and GPM precipitation radar for calibration of weather radars in the Philippines

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Torrential and sustained rainfall from tropical cyclones, monsoons, and thunderstorms frequently impact the Philippines. In order to predict, assess, and measure storm impact, it is imperative to have a reliable and accurate monitoring system in place. In 2011, the Philippine Atmospheric, Geophysical, and Astronomical Services Administration (PAGASA) established a weather radar network of ten radar devices, eight of which are single-polarization S-band radars and two dual-polarization C-band radars. Because of a low-density hydrometeorological monitoring networks in the Philippines, calibration of weather radars becomes a challenging, but important task.

In this study, we explore the potential of scrutinizing the calibration of ground radars by using the observations from the Tropical Rainfall Measuring Mission (TRMM). For this purpose, we compare different TRMM level 1 and 2 orbital products from overpasses over the Philippines, and compare these products to reflectivities observed by the Philippine ground radars. Differences in spatial resolution are addressed by computing adequate zonal statistics of the local radar bins located within the corresponding TRMM cell in space and time.

The wradlib package (Heistermann et al. 2013; Heistermann et al. 2015) is used to process the data from the Subic S-band single-polarization weather radar. These data will be analyzed in conjunction with TRMM data for June to August 2012, three months of the wet season. This period includes the enhanced monsoon of 2012, locally called Habagat 2012, which brought sustained intense rainfall and massive floods in several parts of the country including the most populated city of Metro Manila.

References

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