Impact of GPS RO Data on WRF Simulations of Typhoons Morakot and Megi

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Abstract

Typhoon Morakot (2009), a devastating tropical cyclone (TC) that made landfall in northern Taiwan in August 2009, produced the highest recorded rainfall in southern Taiwan in 50 years. One important factor for its extreme rainfall was the coupling of TC circulation with the southwesterly monsoonal flow. Typhoon Megi (2010), a super-typhoon that mainly influenced the Philippines in October 2010, brought heavy rainfall to eastern Taiwan as a result of the coupling of TC circulation with the northerly monsoonal flow. Using the WRF model and its data assimilation system, this study performs high-resolution simulations of the two typhoon events and compares the simulations with and without GPS RO data assimilation. The impact of GPS RO data on WRF simulations of TC track, TC intensity, and the associated rainfall will be examined. The similarity and difference in terms of GPS RO impact between the two types of coupling circulation will also be discussed.