Analysis and forecast of tropical cyclones during the T-PARCII project

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ABSTRACT

The inner cores of Tropical Cyclone (TC) Lan (2017), TC Trami (2018), and TC Mindulle (2021) were observed by dropsondes during the aircraft missions of the Tropical Cyclones-Pacific Asian Research Campaign for the Improvement of Intensity Estimations/Forecasts (T-PARCII). The dataset has contributed to improving the quality of the analysis and forecast as a ground truth. It has been shown that the dropsonde observations are beneficial for the forecasts of rainfall amount and track for TC Lan (2017). Meanwhile, the intensity forecast skill was "degraded" with respect to the Regional Specialized Meteorological Center (RSMC) Tokyo best track analysis. The degeneration in intensity forecast skill is possibly due to uncertainties in the RSMC Tokyo best track data which relied on the Dvorak technique because the intensity forecast skill was "improved" with respect to the Joint Typhoon Warning Center (JTWC) best track which was much closer to dropsonde observations. The importance of updating the quality of best track based on the ground truth is discussed. As for TC Trami (2018), the rapid weakening of TC intensity was found on 25 September. A coupled atmosphere-ocean model showed that it can be explained by the extreme SST decrease of 7 K through the substantial atmosphere-ocean interaction when the translation speed of the strong TC became less than 3 m/s.

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Keywords: tropical cyclone forecast; data assimilation; coupled model