

Observing System Experiment for Typhoon Trami (2018) using T-PARCII dropsondes and JMA Global Forecasting System

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Airborne typhoon observations were conducted for Typhoon Trami (2018) under Tropical cyclones-Pacific Asian Research Campaign for Improvement of Intensity estimations/forecasts (T-PARCII). Using the dropsonde data (zonal and meridional winds, temperature, and relative humidity) and the Japan Meteorological Agency Global Spectral Model (JMA/GSM, TL959L100) and 4 Dimensional Variational data assimilation (4DVAR, TL319L100), we performed Observing System Experiment (OSE) to see the impact of the newly available observational data on the track/intensity predictions by the JMA/GSM.

Three sets of numerical experiments, CNTL, EXP1 and EXP2, were performed. All the T-PARCII dropsonde and typhoon bogus data were used in the data assimilation in CNTL while T-PARCII dropsonde (typhoon bogus) data only were assimilated in the 4DVAR in EXP1 (EXP2). The period of the experiments is from 2018.09.25 00UTC to 2018.09.28 18UTC with a 6-hour data assimilation and forecasting cycle.

The error of the track predictions of EXP1 and EXP2 is smaller than that of CNTL. For example, the 3-day track prediction error of CNTL, EXP1 and EXP2 is 232, 201 and 218 km, respectively. A possible reason of the degradation of the track predictions by CNTL is that some dropsonde data were assimilated at the almost same locations as typhoon bogus data, which might deteriorate the initial structure of the typhoon.

In the operational configuration of the 4DVAR, all dropsonde data were assimilated irrespective of the existence of the typhoon bogus data. The results of a series of these numerical experiments may lead to improvement in the operational setting of dropsonde assimilation.

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