

Binary interaction between TC Chanthu (2016) and a nearby cold low

*Kosuke Ito¹, Miyabi Higa¹, Johnny Chan²

1. University of the Ryukyus, 2. City University of Hong Kong

Tropical cyclone (TC) Chanthu (2016) caused the heavy rainfall and strong wind on Hokkaido Prefecture, Japan. However, this was one of the "busted" cases in which the track forecast error reached up to 900 km in a 72-h forecast by the Regional Specialized Meteorological Center (RSMC) Tokyo. In fact, the re-forecast experiment with Japan Meteorological Agency Non-Hydrostatic Model (JMA-NHM) that employed Kain-Fritsch scheme as a convective parameterization correctly captured the observed northward translation speed of TC Chanthu, while the JMA Global Spectral Model (JMA-GSM) and JMA-NHM that employed Arakawa-Schubert scheme failed to predict the accurate northward translation speed. The mesoscale analysis showed that there was a cold low located at 200km west of TC Chanthu (2016). With Kain-Frische scheme, the binary interaction between TC Chanthu and the nearby cold low was reproduced so that it contributed the faster translation to the north as consistent with the best track. In contrast, the binary interaction was not reproduced in the simulations with Arakawa-Schubert scheme because a triggered large-scale convection made TC Chanthu and the nearby cold low merged. It exemplifies that the reproduction of fine-scale features diminishes "busted" cases, which contributes to the disaster prevention and mitigation.

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