

A Possible Indirect Connection Between Kuroshio and Typhoon Intensification Over the Autumn Western North Pacific

*Fujiwara Keita¹, Kawamura Ryuichi¹, Kawano Tetsuya¹

1. Faculty of Science, Kyushu University

Remote response of the intensification of Typhoon Tokage (October, 2004) to the variation of vapor transport from the Kuroshio was investigated by simulations using regional cloud resolving model (CReSS) with 0.05° latitude $\times 0.05^\circ$ longitude. We conducted three different experiments: a control (CNTL) run and two sensitivity experiments in which all of or a half of latent heat fluxes over the Kuroshio was excluded during the simulations, referred as to LH00 and LH50 run. CNTL run shows that Tokage to the south of the Kuroshio can accumulate a lot of Kuroshio vapors due to combined effect between Tokage and an eastward-migrating anticyclone around Japan. Trajectory analyses suggest that air parcels intruded into TC inner core region were significantly modified by vapor supply from the Kuroshio and induced latent heating within eyewall and inner rainbands, leading to TC intensification.

In LH00 run, weaken moisture transport from the Kuroshio into TC systems suppresses TC development (~ 15 hPa) especially during the mature stage. Relatively dry air intrusion decreases convective available potential energy and increases vertical stability within TC inner core and attenuates latent heat release due to condensation. In LH50 run, conducting to verify LH00 run results, TC intensity has similar trends with LH00 run and weakens compared with CNTL run (~ 6 hPa). These results suggest that there is a remote linkage between mid-latitude weather systems and TC development through moisture supply from the Kuroshio.

Keywords: typhoon, Kuroshio, regional cloud resolving model