

ON THE RECENT DEVELOPMENT TO TYPHOON RESEARCH

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- (1) Typhoon eye rotation dynamics with vortex Rossby waves.
The importance of the neutral vortex Rossby waves as well as their nonlinear interaction to the eye rotation will be presented.
- (2) Vortex trapping around topography on the beta plane.
The impact of topographic effect on the typhoon-like vortices will be presented.
- (3) Typhoon merger dynamics.
The merger regimes as well as the complete straining out regime for the merger of typhoons Alex and Zeb (1998) will be presented.
- (4) The successive formation of tropical vortices in the North Western Pacific.
The interactions between monsoon circulations and tropical disturbances in the Northwest Pacific, where the low-level mean flow is westerly in the west and easterly in the east, are studied with a barotropic model. Our model results suggest that the scale contraction by the confluent background flow, the nonlinear dynamics, the beta-effect, and the large-scale convergence are important for the energy and enstrophy accumulation near the region where the zonal flow reverses. The energy/enstrophy accumulation can be maintained with a continuous Rossby wave emanation upstream. The largest accumulation occurs when the emanating zonal wavelength is around 2000 km. Longer Rossby waves experience less scale contraction and nonlinear effects while shorter Rossby waves cannot hold a coherent structure against dispersive effects.