

國立中央大學大氣物理研究所書報討論

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Speaker : Wen-Jui Chang

Advisor : Prof. Wei-Yu Chang

Polarimetric Signatures in Landfalling Tropical Cyclones

Abstract

Forecasting the intensity of the Tropical Cyclone(TC) is still challenging, mainly due to the characteristic of small-scale eyewall convection. In order to further understand the vertical microphysics structure of TC's eyewall region, the NEXRAD WSR-88D data were utilized to investigate the polarimetric radar variables such as Z_{DR} and K_{DP} in 8 different landfalling TC for their performance over different microphysics process. Furthermore, by implementing the Quasi-Vertical Profiles (QVPs) and Columnar-Vertical Profile (CVPs), we get to better illustrate the situation in the eyewall or inner rainband.

The hydrometeor size sorting signature can be seen in the stronger TC such as Harvey and Irma, the location of the updraft in the eyewall mainly located in the downshear left direction, which matched with many previous studies. From above the melting layer, the Dendritic Growth Layer (DGL) can be observed with increasing both Z_{DR} and K_{DP} , with weaker TC being more apparent comparing to the stronger one's. Aggregation also can be found at just above melting layer. And the melting layer height perform a upward bend toward the eyewall at around 80km in radius.

Keywords

Hydrometeor size sorting

Dendritic Growth Layer(DGL)

Reference

Homeyer, C. R., and Coauthors, 2021: Polarimetric Signatures in Landfalling Tropical Cyclones. *Mon. Wea. Rev.*, **149**, 131–154, <https://doi.org/10.1175/MWR-D-20-0111.1>.