國立中央大學大氣物理研究所書報討論

Date : 2025/5/16
Location : S1 713
Speaker : Chi-Chun Su
Advisor : Prof. Wei-Yu Chang

The verification and investigation of kinematic characteristics of a linear MCS event during TAHOPE IOP3

Abstract

A linear Mesoscale Convective System (MCS) with Parallel Stratiform (PS) approached northwestern Taiwan on 06 June during TAHOPE2022. To investigate the kinematic characteristics of this convective system, the three-dimensional wind field was retrieved using the WInd Synthesis System using Doppler Measurement (WISSDOM). Range Height Indicator (RHI) observations were incorporated into the validation process to assess the performance of the retrieved wind field. The results reveal that greater radar observation coverage at low levels leads to a more accurate depiction of convective characteristics and vertical velocity structures.

From the synthetic wind field, multiple cells appeared in the southern part of the main convective system during the early stage. These convective cells began to merge northward into the main system, forming a near-coastal intensification structure as the system approached northern Taiwan. This process can be attributed to the convergence between the prefrontal barrier inflow jet and the cold pool generated by precipitation evaporation. Thereafter, the orientation of the main system transformed into a southeastward alignment with a back-building convective structure near the coastal region. The updraft motion became concentrated in the upstream region of the system and caused heavy rainfall as it passed through Miaoli. This feature can be associated with the interaction between low-level winds and the terrain.

Keyword

Mesoscale Convective System (MCS)