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Department of Atmospheric Sciences Seminar Announcement

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SCHOOL OF OCEAN AND EARTH SCIENCE AND TECHNOLOGY

Investigating the Lagrangian evolution of microphysical characteristics of convective precipitation systems using dual-polarimetric radar

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You are invited to our weekly online Atmospheric Sciences Spring 2022 seminars via Zoom meeting.
When: March 23, 2022 at 3:30PM HST
Meeting admission: 3:15PM HST

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Abstract:

The mesoscale convective systems (MCSs) play essential role in contributing heavy precipitation in Taiwan. The microphysical characteristics vary vastly in different types of MCS and modulate the precipitation processes. These microphysical features can be revealed by dual-polarimetric radar measurements. A storm identification and tracking technique (SMART: Storm Motion Analysis by Radar Tracking) was developed and applied to NCAR SPOL data of SoWMEX/TiMREX. The developing and dissipating stage were identified by vertical integrated reflectivity by SMART. Thus, the Lagrangian evolutions microphysical and structural characteristics of convective cells thus were investigated by the vertical slop of various dual-polarimetric measurements (DPMs). The results indicate that all DPM values increase (decrease) during the developing (dissipate) stage. The vertical slop of DPM remains positive values (increase with increasing height). This feature suggest that the large raindrop (Z DR) and high liquid water content (K DP) remain aloft during developing and dissipating stage. On the other hand, the temporal tendency of vertical slope of DPM vary from positive to nearly zero during the developing stage of the storm. Subsequently, the tendency varies from positive to negative during dissipating stage. This indicate that the large raindrop and high liquid water content gradually decent to surface from developing and dissipating stage. The analysis has shown the potential of diagnosing the storm development by utilizing dual-polarimetric parameters.

Keywords: Lagrangian evolution 1; Dual-polarimetric radar 2;