MMM SPECIAL SEMINAR

Physical Processes Leading to Rapid Intensification of Tropical Cyclones in Vertical Wind Shear

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Rapid intensification (RI) of tropical cyclones (TCs) under vertical wind shear (VWS) remains a challenging forecast problem. Environmental VWS is generally recognized as an unfavorable factor to TC intensification, as it tilts the TC vortex and makes the vortex more vulnerable to external forcing (e.g., dry air intrusions). Understanding how the TC vortex overcomes the negative effects of VWS and reaches a "healthy" state before RI onset is key to improving TC intensity forecasts. This study explores the dynamic and thermodynamic mechanisms leading to RI based on a successful WRF simulation of Typhoon Vicente (2012). Results indicate that prior to RI onset, the tilted TC vortex undergoes vertical alignment and the TC inner core becomes nearly saturated. The dynamical pathway leading to vertical alignment will be presented. Thermodynamic budget analyses reveal that the nearly saturated inner core at RI onset is achieved by a competition between surface enthalpy fluxes, radiation, and ventilation effects. Notably, vertical alignment facilitates the moistening of the inner core by reducing outgoing longwave radiation and low-level ventilation.

***Monday, 20 May 2019, 11:00 AM**
***Please note special day/time & location**

Refreshments 10:45 AM

NCAR-Foothills Laboratory, 3450 Mitchell Lane**, FL2-1011 Small Auditorium**

This seminar will be webcast live at:
http://ucarconnect.ucar.edu/live

Recorded seminar link can be viewed here:
https://www.mmm.ucar.edu/events/seminars