MMM SEMINAR SERIES

The Role of Water Vapor in African Easterly Wave Evolution and Tropical Cyclogenesis

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A major hindrance to progress on the topic of tropical cyclone genesis is our limited understanding of interactions between mesoscale processes and the TC seedling and how these interactions are in large part driven by water vapor. In this talk, I'll assess the multi-scale and moisture-dependent nature of African easterly wave (AEW) tropical cyclogenesis (TCG) using observations and in both parameterized and convection-permitting simulations. First, I will go over past work that motivated my current research on the phasing and relative propagation between AEW and MCSs and how it affects the likelihood of TCG. Then, I will discuss the key large-scale monsoonal features over Africa that relate to TCG in the Atlantic. In the second part of the talk, I will focus on the pre-Helene (2006) TCG case using Model for Prediction across Scales–Atmosphere (MPAS-A) simulations. I will show that MPAS-A is capable of reproducing the growth of the case and that its TCG was driven by moisture and convection co-located with the wave vortex, characteristic of moisture modes. Finally, I will present my most recent research on moisture sensitivity, using convection-permitting simulations to further understand the role of moisture in tropical cyclogenesis. Concluding remarks will include the broader impacts of this work in the prediction of TCG.

Thursday, 1 December 2022, 2:00pm

Refreshments 1:45pm

Please also join colleagues for refreshments and informal discussion after the seminar until 3:30pm

NCAR-Foothills Laboratory, 3450 Mitchell Lane
FL2-1022, Large Auditorium

Seminar will also be live webcast
https://operations.ucar.edu/live-mmm
Participants may ask questions during the seminar via Slido.