



Tropical Cyclone Formation Theories: Toward Convergence

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In this presentation, I will present briefly the evolution of theories about tropical cyclogenesis, and the apparent complementarity of current ideas about how hurricanes form. The latter will be illustrated using idealized simulations of the earliest stages of the tropical cyclone in which a surface vortex first becomes established. The results, based on radiative-convective equilibrium calculations, reveal the importance of a persistent, nearly saturated column of air that allows the intensity of convection to increase, and the profile of the vertical mass flux to change, thus favoring an increase of vorticity immediately above the boundary layer with an associated radial pressure gradient. Ensuing convergence in the boundary layer, and hence the intensification of a surface vortex arises from gradient imbalance in the presence of friction. Notably, the elimination of negatively buoyant downdrafts is not important for genesis to occur and greater surface drag results in more rapid initial intensification of the cyclone.

Thursday, 14 February 2019, 3:30 PM

Refreshments 3:15 PM!

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

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