

MMM **SEMINAR** *NCAR*

**Use of the Parcel Buoyancy Minimum (B_{min}) to Diagnose
Thermodynamic Destabilization in Convection-Permitting Simulations**

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Convection-permitting (CP) models are becoming widely used in research and operational forecasting of organized convection. One advantage of such models is they are not exposed to errors associated with cumulus parameterizations. But how do CP models actually initiate convection? In this talk I introduce a method that quantifies mesoscale physical processes responsible for the necessary removal of inhibition energy for convection initiation (CI). The method uses a thermodynamic quantity, B_{\min} , which is the buoyancy minimum experienced by an air parcel lifted from a specified height and a surrogate for the convective inhibition (CIN). B_{\min} budgets are conceptually simpler and perhaps more revealing than their counterparts for CIN since they require knowledge of atmospheric forcing at only the parcel origination level and the level where B_{\min} occurs. In this talk I will demonstrate that processes related to vertical motion are often crucial to the reduction of negative buoyancy and CI in a variety of different MCS initiation environments. Even for mature MCSs with strong cold pools, results from a composite analysis indicate that such destabilization begins 100 to 200 km ahead of the convective system through thermodynamic consequences from mesoscale upward motion. These consequences include both moistening from vertical advection at parcel origination levels and adiabatic cooling of the environment above.

*This seminar will be recorded and available via webcast at:
<http://www.fin.ucar.edu/it/mms/fl-live.htm>*

Thursday, 3 October 2013, 3:30 PM
Refreshments 3:15 PM
NCAR-Foothills Laboratory
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