
MMM **SEMINAR** *NCAR*

Kilometer-Grid Modeling and its Subgrid-Scale Fluxes

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With the rapid increase in computer power, non-hydrostatic high-resolution models are becoming increasingly important not just for research but also for climate predictions and weather forecasting. Worldwide, numerous meteorological centers are now developing kilometer-grid global cloud-resolving models (CRMs). While many of these efforts are devoted to building dynamical cores, my research focuses on the analysis and parameterization of the unknown subgrid-scale (SGS) motions in CRMs.

I will first discuss issues with CRMs based on a benchmark large-eddy simulation (LES) of a tropical deep convection system using 10^{19} gridpoints. This Giga-LES covers a domain of 204.8 km x 204.8 km x 27 km over the tropical ocean with a horizontal grid mesh of 100 m. The simulation captures a wide range of scales, from mesoscale eddies down to turbulent motions, and provides a key benchmark to study SGS motions in CRMs. I will show that a significant fraction of the vertical transport is carried by motions smaller than a typical CRM grid mesh.

The second part of my talk discusses the use of the Giga-LES in developing SGS parameterizations for CRMs. The Giga-LES flow fields are partitioned into CRM resolved and CRM SGS components and their relationship is investigated. I will show that conventional SGS-flux schemes are inadequate in representing SGS transport processes in CRMs.

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

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Refreshments 3:15 PM

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