

NOAA Climate Test Bed Joint Seminar Series

A Goddard Multi-Scale Modeling System with Unified Physics

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ABSTRACT

A multi-scale modeling system with unified physics has been developed at NASA Goddard Space Flight Center (GSFC). The system consists of an Multi-scale Modeling Framework (MMF), the coupled NASA Goddard finite-volume GCM (fvGCM) and Goddard Cumulus Ensemble model (GCE, a CRM); the state-of-the-art Weather Research and Forecasting model (WRF) and the stand alone GCE. These models can share the same microphysical schemes, radiation (including explicitly calculated cloud optical properties), and surface models that have been developed, improved and tested for different environments.

In this talk, I will present: (1) A brief review on GCE model and its recent improvement/performance of microphysics schemes, (2) A discussion on the Goddard WRF version (its developments and applications), and (3) A brief review of Goddard MMF and its performance.

We are also performing the inline tracer calculation to comprehend the physical processes (i.e., boundary layer and each quadrant in the boundary layer) related to the development and structure of hurricanes and mesoscale convective systems. In addition, high - resolution (spatial. 2km, and temporal, 1 minute) visualization showing the model results will be presented.