



Toward credible predictions of aerosol-cloud interactions in Earth system models

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The role of aerosol-cloud interactions in the Earth system is a major source of uncertainty in projections of Earth's future climate and in interpreting how the climate has evolved in the past. The “Enabling Aerosol-cloud interactions at GLobal convection-permitting scales (EAGLES)” project explores several approaches to tackle this challenge, including developing better physical representations of aerosol and cloud processes, increasing model resolution to kilometer-scale, deploying machine learning techniques to replace or augment traditional parameterizations, and constraining the model using process-oriented diagnostics based on both satellite and in-situ measurements. In this effort, process model, large-eddy, convection-permitting, and climate-scale perturbed physics simulations have been performed to generate hundreds of terabytes of data. Combined with observational data from ARM, satellite, and other sources, these simulation and measurement datasets provide the basis for model development and evaluation across various conditions of aerosol, cloud, and meteorological factors. Model biases associated with resolution and physics are quantified and addressed appropriately. Cloud adjustments are parameterized based on large ensembles of kilometer-scale and large-eddy scale simulations. We demonstrate that improved atmospheric simulations can be achieved with better physics, better software, and better integration with data.

Thursday, 5 October 2023, 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.