**Agenda**

**Symposium on Mesoscale to Microscale Coupling Methods**

**to Meet the Wind Industry’s Needs**

**Sept. 14, 15: 9:00 - 1:00 MDT**

**Virtual – zoom link : Will be provided to registrants**

**Registration Link -** <https://ral.ucar.edu/events/2022/mmc-methods-meet-wind-industrys-needs>

**Purpose:** To make the wind industry and others aware of the tools that have been developed by the DOE-sponsored Mesoscale-to-Microscale Coupling (MMC) team, discuss issues to consider in coupled modeling, describe best practices based on our experience, and describe lessons learned. We define MMC as coupling mesoscale models to large-eddy simulation models (LES).

**Day 1 - Sep 14, 2022**

**MDT**

**9:00 Welcome and A2e Program Overview:** Mike Derby, DOE WETO

* A2e Program Goals and Accomplishments

**9:15 Introduction to MMC Methods and Research Questions:** Sue Ellen Haupt, NCAR

* Rationale for using MMC
* Research questions addressed
* Overview of tools produced and archived

**9:45 Mesoscale Forcing for Microscale Simulations** Branko Kosović, NCAR

* Forcing with large scale pressure gradients
* Forcing with mesoscale tendencies
* Nesting LES within a mesoscale domain
* Modeling real gravity waves

**10:15 Coupling Methods:** William Lassman, LLNL

* Overview of methods
* Intercomparison
* Lessons learned and best practices

**10:45 Break**

**11:15 Initializing Unresolved Turbulence at the Microscale:** Jeff Mirocha, LLNL

* Why is this needed?
* Methods that can be used
* Lessons learned and best practices

**11:45 Modeling in Complex Terrain:** Regis Thedin, NREL

* Overview of MMC on complex terrain
* Practical numerical issues
* Lessons learned and best practices

**12:15 Modeling in the Terra Incognita (Grey Zone):** Raj Rai, PNNL

* What is it and why does it matter?
* Demonstration of simulations in that zone
* Lessons learned and best practices

**12:45 3DPBL Parameterization for WRF:** Tim Juliano, NCAR

* Motivation and approach
* Considerations for convective conditions
* Improvements in cold pool and LLJ simulations

**1:00 Adjourn for the day**

**Day 2 - Sep 15, 2022**

**MDT**

**9:00 Dealing with Spurious Gravity Waves:** Matt Churchfield, NREL

* Atmospheric gravity waves
* How they can be generated spuriously in some codes
* Potential resolutions

**9:30 Surface and Boundary Conditions:** Jeff Mirocha, LLNL

* Maintaining consistency across scales
* What to use when
* Lessons learned and best practices

**10:00 Offshore Wind Modeling:** Pat Hawbecker, NCAR

* Special issues for offshore models
* Comparison of SST and surface roughness schemes
* Lessons learned and best practices

**10:30 Progress in Machine Learning Applications:** David John Gagne and Susan Dettling, NCAR

* ML Surface Layer scheme
* Downscaling from mesoscale to microscale with deep learning
* Progress and prospects

**11:00 Break**

**11:30 Documentation and Common Verification for Research Reproducibility:** Eliot Quon, NREL

* Read the Docs living documentation
* Open-source analysis tools
* Repository of models, model inputs, and analyses

**12:00 Summary and Continuity:** Larry Berg, PNNL

* Where did we start?
* Key findings over the life of the project.
* How can you leverage the progress that’s been made?

**12:30 What’s Next for DOE Atmospheric Science Research?** Shannon Davis, DOE WETO

* New projects coming
* How MMC tools are being used in new projects

**1:00 Adjourn**