

Multiscale Atmospheric Dispersion

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Application User Requirements

- **Credible Models are Required by the Energy Industry and the Energy Policy Communities, for Prediction, Assessment, and Strategic Purposes**
- **Energy Policy in the Context of Air Quality Standards**
- **Energy Policy in the Context of Economic, Human Health, and Technological Impacts**

Research User Requirements

- Sophisticated Models Required to Understand and Quantify the Complex Interactions among Meteorology, the Atmospheric Chemistry of Gases, and Aerosol Chemistry and Physics
- Because Dispersion is an Important Factor in this Mix, we need Models that describe it well over a Variety of Scales, from tens of meters or less up to hundreds of kilometers or more
- Sophisticated or Research Models can then be used to develop Parameterizations for Application Models

- **Research Requirements in Atmospheric Chemistry**
 - Understanding the Atmospheric Photochemistry of VOCs
 - Understanding of Heterogeneous Reactions
 - Understanding of Co-pollutant Relationships
 - Better Characterization of Wet- and Dry- Deposition Processes
 - Better Emission Inventories for PM and Ozone Precursors

- **Research Requirements in Environmental Meteorology**
 - Urban- and Regional-Scale Transport
 - Transport of Pollutants Across Borders
 - Transport by Mean Winds
 - Diffusion Through Turbulence
 - Vertical Transport and Mixing

- **Current Program ~ \$ 12m per year**

Additional Requirements

- **Improved Understanding and Model-Based Description of the Loading and Properties and Transport of Atmospheric Aerosols in Relation to Sources**
 - **Air Quality and Climate Change Drivers**
 - **Meeting PM 2.5 and PM 10 Standards**
 - **Atmospheric Processes in the Context of Human Health and Exposure**