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# atmospheric transport and dispersion over complex terrain

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The accurate simulation of atmospheric transport and dispersion requires a numerical weather prediction model that is able to resolve both mesoscale meteorology, such as a storm front or sea breeze, and microscale meteorology near the plume source, which is strongly influenced by the presence of complex terrain (i.e., mountains or dense urban development). Current generation numerical weather prediction models are excellent tools for simulating mesoscale meteorology; however, model design constraints present challenges to running at microscale resolutions over complex terrain. These challenges include, but are not limited to, overcoming model restrictions on resolved terrain slopes, parameterizing the effects of turbulent mixing, and appropriately downscaling information from the mesoscale to the microscale. A sequence of field experiments in 2019 at the Lawrence Livermore National Laboratory Site 300 included the controlled generation, observation and monitoring of plumes in a region of complex terrain. Data from these field experiments are used to evaluate model performance and inform model development that will improve the accuracy of transport and dispersion simulations over complex terrain.

## Promotional text

This research focuses on understanding and improving the accuracy of atmospheric models used for simulating transport and dispersion over complex terrain.

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