Abstract Submitted
for the DFD08 Meeting of
The American Physical Society

Large-eddy simulation of scalar transport over complex terrain TAKENOBU MICHIOKA, CRIEPI, FOTINI CHOW, UC, Berkeley — An atmospheric large-eddy simulation code has been applied to simulate scalar transport and dispersion from point source releases during a field campaign conducted near Mt. Tsukuba, Japan. The simulations use horizontal grid resolution as fine as 190m with six grid nesting levels to incorporate time-dependent meteorological forcing. The results show that predicted ground concentration values contain significant errors compared to measured values because the mesoscale wind typically contains a wind direction bias of a few dozen degrees. Comparisons of simulation results with observations of arc maximum concentrations, however, lie within acceptable error bounds. Additionally, the choice of lateral boundary condition update interval is found to not affect time-averaged quantities but to strongly affect the scalar transport. More frequent updates improve the simulated ground concentration values. In addition, results show that the computational mixing coefficient must be set to as small a value as possible to improve scalar dispersion predictions.

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Date submitted: 25 Jul 2008 Electronic form version 1.4