International Aerosol Modeling Algorithms (IAMA) Conference
UC Davis

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http://airquality.ucdavis.edu/pages/events/2009/iama.html

Summary of Session: “Meteorology Modeling for Chemical Transport Modeling”

Presentations in the session on “Meteorology Modeling for Chemical Transport Modeling” covered a wide range of meteorology modeling issues and emphasized the challenges of meteorology modeling for air quality applications. Dick McNider started the session by showing that the mechanisms for high concentrations along stationary fronts are mainly stagnant winds, high surface temperatures, and subsidence. John Nielsen-Gammon analyzed the sensitivity of a PBL model to its parameters as preparation for EnKF data assimilation for parameter estimation. Bruce Jackson demonstrated different responses to control strategies using different meteorology models. Song-You Hong discussed issues related to PBL modeling and showed strong interactions between the physical processes of the stable boundary layer (SBL) and gravity wave drag. Wen-Yih Sun demonstrated the capabilities of a semi-Lagrangian advection scheme that had minimal numerical diffusion, mass conservation, and was able to use long time-steps for computational efficiency. Jin Luen Lee discussed a new multistep flux-corrected advection scheme for Icosahedral Finite-Volume global models. Jerome Fast discussed many challenges for meteorology models that have great impact on air quality modeling such as PBL, especially the SBL and surface fluxes, local thermally-driven flows, relative humidity, and clouds. Robert Fovell showed the difficulty in forecasting fog with several different physics options in WRF with persistent unexplained dry bias. Jim Wilczak demonstrated that wind direction errors in several different models limit accurate PM forecasts. These presentations accentuate the need to evaluate and study the sensitivity of modeled meteorology. Often small variations in modeling techniques, such as physics parameterizations, data assimilation, geophysical data, and grid structures can produce large variations in air quality model results.