VALIDATION OF HPAC PROBABILISTIC ATMOSPHERIC TRANSPORT MODEL WITH STATISTICAL ENSEMBLE DISPERSION TRIAL DATA

Thomas A. Mazzola
Logicon Advanced Technology, Alexandria, VA USA

Dev Srinivasa
Logicon Advanced Technology, Los Angeles, CA USA

Transport of contaminants in the turbulent atmosphere has an intrinsic stochastic character. Typical deterministic predictive models provide an ensemble mean concentration value, but are not able to predict the exact path and diffusion due to unpredictable turbulent motions of the atmosphere. A probabilistic transport model predicts both ensemble means and variances, and has a unique role in that it can provide rational uncertainty bounds on prediction of contaminant concentrations and dosages.

The Second-order Closure Integrated Puff (SCIPUFF) model[1] is the atmospheric transport engine currently used in the Hazard Prediction and Assessment Capability (HPAC).121 HPAC was developed by the Defense Threat Reduction Agency (DTRA) to assess particulate and gaseous hazards in the atmosphere, and is applicable to analyzing atmospheric transport of detonation products, dust or other contaminants of interest to the MABS simulation community. We will demonstrate the partial validation of the SCIPUFF probabilistic transport model.