Abstract Submitted
for the DFD09 Meeting of
The American Physical Society

Effects of Release Characteristics on Urban Contaminant Dispersal A.J. WACHTOR, University of California, Irvine, F.F. GRINSTEIN, Los Alamos National Laboratory, H.J. CATRAKIS, University of California, Irvine —
The release of a chemical, biological, or radioactive contaminant in an urban environment is of particular interest due to the high population densities in urban areas. The wind flow that transports the contaminant through the urban setting is highly complex and exhibits a wide range of multi-scale phenomena. Studies of urban flows can provide information that can be of critical importance to city, state, and federal officials for creating risk management plans. Classical field experiments measuring the dispersion of scalars in urban environments provide only rather limited results. Computational experiments have the advantage of being able to offer greater insight and knowledge about the three-dimensional flow physics than field experiments are able to provide. Implicit Large Eddy Simulation (ILES) is currently a promising computational method to obtain reasonable results of urban flows. ILES resolves the large scale flow features and relies on inherent numerical dissipation to model energy transfer from the resolved scales to the sub-grid scales. Since it is the large scale dispersion of the contaminant that is of key interest, ILES is particularly well suited for this application. NRL's FAST3D-CT model based on ILES is used to simulate scalar contaminant transport in a complex urban setting. We present a study of the effects that location and associated potential temperature of the scalar contaminant release have on the subsequent dispersion of that scalar within the specified urban geometry.

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Date submitted: 12 Aug 2009 Electronic form version 1.4