Effect of hilly urban morphology on dispersion characteristics in the urban boundary layer
Jan Kleissl*, Long Sun
*University of California

Abstract
Turbulent interaction between flow and urban morphology dominates transport and dispersion in the urban atmospheric canopy layer (ABL). However, most Large Eddy Simulation (LES) codes for the ABL are limited to rectangular buildings on a flat land surface. The Immersed Boundary Method as implemented at UCSD can be used to simulate flow around any three-dimensional obstacle without changing the pseudospectral numerical method or the cartesian grid.

Numerical simulations of the flow over an urban building array on top of a two-dimensional hilly land surface were carried out. We examined the effect of overall roughness length, ratio of building height to hill height, and building spacing to hill spacing on velocity variance profiles and canyon ventilation.