Abstract Submitted
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Dispersion length scales within the urban canopy[1] PABLO HUQ, University of Delaware, PASQUALE FRANZESE, George Mason University — We discuss the results of lab experiments on three model urban canopies with small, medium and large building aspect ratios to examine the physics of dispersion within the urban canopy from a near-ground continuous point source of passive scalar. The model urban canopies had aspect ratios of building height to width (H/w) = 0.25, 1, 3. Measurements were taken of the turbulent velocity and scalar fields. Plume spreads, concentrations and distance from the source were non-dimensionalized using urban canopy length, time and velocity scales based on the geometry of the buildings. The scaling collapses the data for all three aspect ratios. A model to describe the results is developed. The model is based on a simple Gaussian formulation where the diffusion coefficients are determined by the theories of Taylor (1921) in the horizontal plane, and Hunt and Weber (1979) to account for the vertically inhomogeneous turbulence.

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