Numerical simulation of turbulence and dispersion over groups of buildings
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Abstract

The urban roughness sublayer is characterized by high temporal and spatial variability due to the nature of turbulent flow as well as the geometrical heterogeneity of urban morphology. To better understand and parameterize urban turbulence for applications such as dispersion, it is necessary to know what are the key features and processes governing turbulent flow in urban areas, and how they depend on urban morphological parameters. This paper will present new numerical results, using mainly direct numerical simulations, investigating the dependence of turbulence statistics and flow structure on key characteristics such as wind direction, building layout, building shape, and building height variability. Based on the results, new approaches to parameterizing drag and turbulence in urban areas will be explored.