Geometric and scale dependency of scalar transfer coefficient

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The momentum and scalar forcings via urban surfaces are one of the important factors to determine velocity and concentration fields within urban boundary layers. Surface fluxes are commonly modelled by the bulk transfer methods in which the drag force and scalar flux from the surface are parameterized by the bulk transfer coefficients and the differences in the quantity across the interface. However, the geometric and scale dependency of the bulk scalar transfer coefficients not well known. In this presentation, we discuss how we can consider the geometric and scale dependency of the bulk scalar transfer coefficients. To understand the geometric dependency, we performed a series of wind-tunnel experiments under neutral conditions and create a comprehensive database of the bulk scalar transfer coefficients using regular block arrays representing an urban environment. The various configurations of the block arrays allow us to determine influential factors for the bulk scalar transfer coefficients. In addition, we consider how we can apply the results from a laboratory work to an urban boundary layer a realistic scale by referring previous literatures dealing with the scale dependency of the bulk scalar transfer coefficient.

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Refreshments 3:15pm

NCAR-Foothills Laboratory, 3450 Mitchell Lane

FL2-1022-Large Auditorium

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