Laboratory Modeling of Environmental Flows: From Mesoscale to Streetscale

The high cost and site-specific results of field experiments have made water channels and wind tunnels important tools for the investigation of urban air quality. However, the applicability of laboratory studies depends on the correct scaling of the dominant physical properties. Simulation of the urban dispersion problems in laboratory facilities requires correct scaling of mean flow, plume rise, and turbulence governed plume spread. In this presentation we will start from mesoscale flows and zoom in all the way to the streetscale. Scaling methods will be discussed, influence of tall buildings and highway sound barriers on the near ground dispersion will be explained.