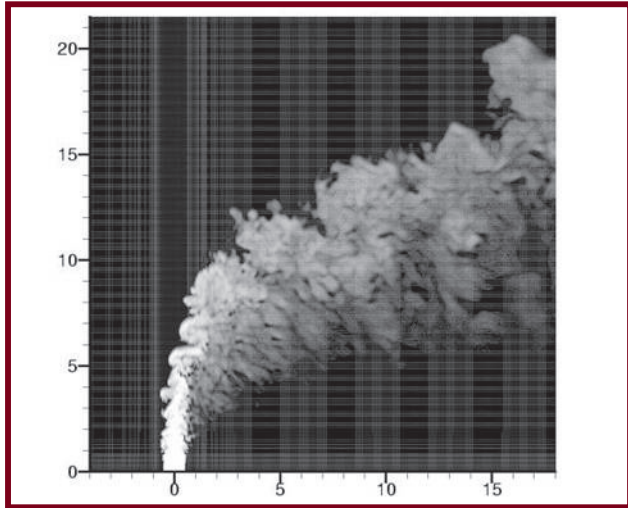


SAFL SEMINAR SERIES

WEDNESDAY, NOVEMBER 9, 2011, 3:30PM
ST. ANTHONY FALLS LABORATORY ~ AUDITORIUM



Simulation and control of jets in crossflow

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Abstract:

Jets in crossflow are central to a variety of applications; e.g. dilution jets in gas--turbine combustors, film--cooling, and fuel injection. This talk will discuss our work on the simulation and control of passive scalar mixing by turbulent jets in crossflow. We have developed an analytical scaling for jet trajectory that accounts for jet velocity profile and crossflow boundary layer thickness. Also direct numerical simulation has been performed under conditions corresponding to recent experiments. The simulation results will be used to propose physical mechanisms for entrainment and mixing. A simple model that explains jet deformation as a result of acceleration imposed by the crossflow will be discussed. The talk will then discuss the control of jets in crossflow using pulsing. The main idea pursued here is that pulsing generates vortex rings and the effect of pulsing can therefore be explained by studying the behavior of vortex rings in crossflow. A regime map is proposed that collapses optimal conditions from experiments.