Meeting: 1000, Albuquerque, New Mexico, SS 9A, Special Session on Mathematical Methods in Turbulence

1000-76-206 **Christopher A. Jeffery*** (cjeffery@lanl.gov), MS-D436, ISR-2, LANL, Los Alamos, NM 87544. *Kinematic Simulation of Log-Layer Turbulence using the Langevin Equation.*

Simulation of the turbulent "log-layer" region near a rough wall is computationally challenging since large eddy time and length scales decrease linearly with height from the wall. Traditional computation schemes (e.g. DNS, LES) fail to resolve the near-wall inertial subrange, and, as a result, vertical fluxes are underestimated in this region.

We present a new approach for simulating log-layer turbulence that uses a height-dependent Langevin equation to produce a 2D, vertically non-homogeneous, divergence-less, random field with an inertial regime that extends to the smallest resolved scales. The transport properties of this synthetic field—at all heights in the computational domain—are shown to agree well with both theoretical predictions and experimental observations. The new model is used to compare and contrast the transport properties of inert and reactive scalars in the log-layer region. (Received August 24, 2004)