Abstract Submitted
for the DFD06 Meeting of
The American Physical Society

Large-eddy Simulation of Particle Concentration by Equilibrium Eulerian Approach[1] BABAK SHOTORBAN, University of Illinois, S. BAL-ACHANDAR, University of Florida — A Large-eddy Simulation (LES) formulation is developed for particle concentration in turbulent flows using equilibrium assumption in which the velocity of particle can be expressed in terms of the velocity and acceleration of fluid for small Stokes numbers (Maxey, JFM, 1987). Filtered particle concentration defined in this formulation is solved in the Eulerian frame using a transport equation with a closure problem in the form of subgrid-scale particle flux term. A Smagorinsky type of model is proposed to close this term. The model is implemented in a particle-laden forced isotropic turbulent flow and the LES results assessed against the results obtained by Direct Numerical Simulation (DNS). Good agreement is observed between them.

S. Balachandar
University of Florida

Date submitted: 05 Aug 2006   Electronic form version 1.4