

Abstract Submitted  
for the DFD11 Meeting of  
The American Physical Society

**DNS of aerosol evolution in a turbulent jet** KUN ZHOU, ANTONIO ATTILI, FABRIZIO BISETTI, Reactive Flow Modeling Laboratory, King Abdullah University of Science and Technology — The effects of turbulence on the evolution of aerosols are not well understood. In this work, the interaction of aerosol dynamics and turbulence are studied in a canonical flow configuration by numerical means. The configuration consists of a hot nitrogen stream saturated with dibutyl phthalate (DBP) vapor mixing with cool air in a shear layer. A direct numerical simulation (DNS) for the momentum and scalar fields is coupled with the direct quadrature method of moments (DQMOM) for the condensing liquid phase. The effects of turbulent mixing on aerosol processes (nucleation, condensation, and coagulation) are quantified by analyzing the statistics of number density and droplet sizes.

Kun Zhou  
Reactive Flow Modeling Laboratory,  
King Abdullah University of Science and Technology

Date submitted: 02 Aug 2011

Electronic form version 1.4