Abstract Submitted
for the DFD11 Meeting of
The American Physical Society

One-dimensional-turbulence simulations of reactive Rayleigh-Taylor turbulence[1] ESTEBAN GONZALEZ, ALAN KERSTEIN, Sandia National Laboratories, DAVID LIGNELL, Brigham Young University — We consider the problem of reactive Rayleigh-Taylor turbulence in the Boussinesq framework, and model combustion with a reaction-progress-variable method, and a KPP reaction. The interesting feature of this problem is that the interface (flame) between heavy/cold reactants and light/hot products moves against gravity. Such problem is challenging because of the delicate interplay between turbulence, buoyancy, and reactions, and the wide separation between large and small scales. One model that has the capabilities to deal with these challenges is the one-dimensional-turbulence (ODT) model. In this talk, we discuss ODT results for non-reactive and reactive Rayleigh-Taylor turbulence, and compare them with those from direct numerical simulations (DNS). Here, the key advantage of ODT over DNS is that it can be used to explore larger parameter spaces.

[1]This work was supported by the U.S. Department of Energy, Office of Basic Energy Sciences, Division of Chemical Sciences, Geosciences, and Biosciences.

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Date submitted: 29 Jul 2011 Electronic form version 1.4