Abstract Submitted
for the DFD14 Meeting of
The American Physical Society

Adaptive Discrete Equation Method for injection of stochastic cavitating flows GIANLUCA GERACI, Stanford Univ and Inria Bordeaux, MARIA GIOVANNA RODIO, Inria Bordeaux, GIANLUCA IACCARINO, Stanford Univ, REMI ABGRALL, Universitat Zurich, PIETRO CONGEDO, Inria Bordeaux — This work aims at the improvement of the prediction and of the control of biofuel injection for combustion. In fact, common injector should be optimized according to the specific physical/chemical properties of biofuels. In order to attain this scope, an optimized model for reproducing the injection for several biofuel blends will be considered. The originality of this approach is twofold, i) the use of cavitating two-phase compressible models, known as Baer & Nunziato, in order to reproduce the injection, and ii) the design of a global scheme for directly taking into account experimental measurements uncertainties in the simulation. In particular, stochastic intrusive methods display a high efficiency when dealing with discontinuities in unsteady compressible flows. We have recently formulated a new scheme for simulating stochastic multiphase flows relying on the Discrete Equation Method (DEM) for describing multiphase effects. The set-up of the intrusive stochastic method for multiphase unsteady compressible flows in quasi 1D configuration will be presented. The target test-case is a multiphase unsteady nozzle for injection of biofuels, described by complex thermodynamics models, for which experimental data and associated uncertainties are available.

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Date submitted: 02 Aug 2014 Electronic form version 1.4