Abstract Submitted
for the DFD19 Meeting of
The American Physical Society

Honoring Ted OBrien: High order methods for filtered and probability density function models GUSTAAF JACOBS, San Diego State University — The systems of partial differential equations that govern probability and filtered density function models can be solved directly using numerical methods. Oftentimes, this type of system is also solved using a combination of Monte-Carlo and stochastic differential equations. If the density function model is coupled with another model that has feedback, as can occur in multi-physics or multi-phase environments, then the numerical coupling must be consistent for both approaches to obtain an accurate numerical solution. In this talk, I will discuss recent progress in the development of high order accuracy methods for models governing, chemically reaction and/or particle-laden, high-speed flows with shocks. High order distribution functions and weighted interpolations combined with spectral elements methods are presented and are shown to give accurate results for time-dependent problems that require long time integration.

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Date submitted: 30 Jul 2019 Electronic form version 1.4