Abstract Submitted
for the DFD09 Meeting of
The American Physical Society

Gradient-Augmented Level Set and Sub-Grid Accuracy in Multi-Phase Simulations JEAN-CHRISTOPHE NAVE, MIT — In this presentation we will discuss a new method for solving the advection equation for a level set function. The approach relies on carrying both function values and gradients of the level set function as coupled evolved quantities, using Hermite interpolants and a semi-Lagrangian strategy. Some benefits compared to the traditional WENO approach include: better mass conservation, no need to solve a reinitialization equation, ability to capture features smaller than the grid resolution, computational speed, optimally local stencils, and second order accurate curvature calculation. To demonstrate the value of the new method, we will present several two-phase flow simulations for which sub-grid accuracy is important.

Jean-Christophe Nave
MIT

Date submitted: 04 Aug 2009 Electronic form version 1.4