The Refined Level Set Grid Method for Simulating Liquid/Gas Interfaces[1] MARCUS HERRMANN, Center for Turbulence Research, Stanford University — The Refined Level Set Grid (RLSG) method is a level set based interface tracking scheme that allows for grid converged simulations of the phase interface geometry. The Navier-Stokes equations describing the flow can be solved on a structured or unstructured grid, whereas all level set equations are solved on a separate, equidistant Cartesian grid that can be independently refined to ensure grid convergence of the phase interface geometry. Coupling of the two grids is performed using the parallel interpolation and volume integration infrastructure CHIMPS. Together with a recently proposed balanced force algorithm [Francois et al., JCP 2006] the resulting coupled scheme gives second order converging spurious currents in the canonical test of an inviscid stationary drop. Test cases highlighting the performance of the RLSG method as well as extensions of the method to simulate liquid jet atomization will be discussed.

Marcus Herrmann
Center for Turbulence Research, Stanford University