

Abstract Submitted
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Large eddy simulation of cavitating flows¹ ASWIN GNANASKANDAN, KRISHNAN MAHESH, University of Minnesota — Large eddy simulation on unstructured grids is used to study hydrodynamic cavitation. The multiphase medium is represented using a homogeneous equilibrium model that assumes thermal equilibrium between the liquid and the vapor phase. Surface tension effects are ignored and the governing equations are the compressible Navier Stokes equations for the liquid/vapor mixture along with a transport equation for the vapor mass fraction. A characteristic-based filtering scheme is developed to handle shocks and material discontinuities in non-ideal gases and mixtures. A TVD filter is applied as a corrector step in a predictor-corrector approach with the predictor scheme being non-dissipative and symmetric. The method is validated for canonical one dimensional flows and leading edge cavitation over a hydrofoil, and applied to study sheet to cloud cavitation over a wedge.

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