Abstract Submitted
for the DFD19 Meeting of
The American Physical Society

A volume-of-fluid (VOF) methodology for the prediction of cavitation phenomena[1] ALI FAKHREDDINE, KARIM ALAME, KRISHNAN MAHESH, University of Minnesota — A sharp interface approach for modeling cavitation phenomena in incompressible viscous flows is presented. We utilize the incompressible Navier-Stokes equations with a modified Poisson equation. The modification to the Poisson equation accounts for phase change taking place at the interface between the vapor-liquid phases. We adopt a one-fluid formulation for the vapor-liquid two-phase flow and the interface is tracked using a volume-of-fluid (VOF) methodology. The model is validated with canonical test cases. The interaction of bubbles with a boundary layer is discussed.

[1]This work is supported by the Office of Naval Research (ONR)

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Date submitted: 30 Jul 2019 Electronic form version 1.4