A volume-of-fluid (VOF) methodology for the prediction of cavitation phenomena\textsuperscript{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.

\textsuperscript{1}This work is supported by the Office of Naval Research (ONR)