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**Cavitation Bubble in Shear Flow** SADEGH DABIRI, Massachusetts Institute of Technology, WILLIAM SIRIGNANO, University of California Irvine, DANIEL JOSEPH, University of Minnesota, University of California Irvine — In the orifice of liquid injectors at high pressure, cavitation occurs behind the sharp corners, where a strong pressure drop is present due to quick change in the flow direction. In addition, a high level of shear is present inside the boundary layer. Therefore, it is important to understand the influence of the shear on the cavitation. In this study, the deformation of a cavitation bubble in shear and extensional flows is numerically investigated. The Navier-Stokes equations are solved to observe the three-dimensional behavior of the bubble as it grows and collapses. During the collapse phase of the bubble, two re-entrant jets are observed on two sides of the bubble due to interaction of the bubble with the background flow. Re-entrant jets with enough strength could breakup the bubble into smaller bubbles. Post processing of the results is done to cast the disturbance by the bubble on the liquid velocity field in terms of spherical harmonics. It is found that a quadrupole moment is created in addition to the monopole source. As the bubble collapses regions of high vorticity are created near the bubble interface.

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