

Abstract Submitted
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Jet-Wake Interaction and its Effect on Cavitation¹ ROGER ARNDT, WILLIAM HAMBLETON, University of Minnesota, EDUARD AMROMIN, SVETLANA KOVINSKAYA, Mechmath LLC — Model studies were conducted in support of research on a waterjet propulsion scheme. Of interest are cavitation inception and the formation of a bubbly wake. Most studies of jet cavitation have been for discharge into quiescent flow. However little data exists for jets discharging into a bluff body wake. This study is a preliminary examination of the fundamental physics. A water tunnel model consisting of an axisymmetric Schiebe body, truncated abruptly at the aft end is utilized. A jet issues from a sharp-edged orifice at the aft of the model. Cavitation inception and bubble characteristics are determined as a function of Reynolds number and jet velocity ratio. Additionally, particle image velocimetry is employed to investigate the flow kinematics in the near wake of the model. Complex interactions are found to take place between the jet and wake that seem to have significant implications for cavitation inception.

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