Abstract Submitted
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Examination of Wake Cavitation Dynamics Using Time-Resolved X-Ray Densitometry[1] HARISH GANESH, University of Michigan, LISA DEIJLEN, University of Twente, JULIANA WU, ANUBHAV BHATT, STEVEN CECCIO, University of Michigan — Cavitation in the wakes of bluff bodies is known to affect the wake shedding frequency and the properties of the resulting far wake. In particular, as the cavitation forms in the wake, with decreasing cavitation number the wake shedding Strouhal number will increase, reaching a peak value before decreasing as the wake forms a super cavity. further. The physical mechanism responsible for this observed change in shedding dynamics is yet to be fully understood. In the current study, we employed time resolved X-ray densitometry, high-speed videography, to study the cavitation dynamics in the wake of a triangular, nominally two-dimensional wedge in a re-circulating water tunnel to understand the underlying mechanisms responsible for cavity formation and shedding. Void fraction flow fields revealed the presence of bubbly shocks in the cavitating vortical region around the conditions of peak Strouhal number. Using average static pressure and dynamic pressure measurements at the base of the wedge at different cavitation numbers, a physical mechanism responsible for the observed change in dynamics is proposed.

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