Abstract Submitted
for the DFD15 Meeting of
The American Physical Society

Cavitation dynamics on a NACA0015 hydrofoil using time resolved X-ray densitometry[1] HARISH GANESH, JULIANA WU, STEVEN CECCIO, University of Michigan — Recent investigations of partial cavitation have shown that the transition from stable to shedding cavities can be related to the presence of both propagating bubbly shocks and re-entrant liquid jets originating in the cavity closure region. In the present study, formation of sheet cavitation and its transition to periodically shedding cavities is studied on a NACA0015 hydrofoil in a recirculating water tunnel at different attack angles. Using high-speed videos and time resolved X-ray densitometry, the instantaneous void fraction flow fields are obtained to identify the principal mechanism responsible for transition from stable to shedding cavities over a range of attack angles and cavitation numbers. The role of attack angle is of particular interest, since is it related to the pressure gradient at cavity enclosure, and can lead to the formation of stronger reentrant flows. The relative importance of reentrant liquid flow and bubbly shock wave propagation will be discussed

[1]This work is supported by Office of Naval Research

Harish Ganesh
University of Michigan

Date submitted: 31 Jul 2015 Electronic form version 1.4