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Development of an Acoustic Localization Method for Cavitation Experiments in Reverberant Environments MINNA RANJEVA, LEE THOMPSON, Penn State - ARL, DANIEL PERLITZ, Penn State - ARL, WILLIAM BONNESS, DEAN CAPONE, BRIAN ELBING, Penn State - ARL — Cavitation is a major concern for the US Navy since it can cause ship damage and produce unwanted noise. The ability to precisely locate cavitation onset in laboratory scale experiments is essential for proper design that will minimize this undesired phenomenon. Measuring the cavitation onset is more accurately determined acoustically than visually. However, if other parts of the model begin to cavitate prior to the component of interest the acoustic data is contaminated with spurious noise. Consequently, cavitation onset is widely determined by optically locating the event of interest. The current research effort aims at developing an acoustic localization scheme for reverberant environments such as water tunnels. Currently cavitation bubbles are being induced in a static water tank with a laser, allowing the localization techniques to be refined with the bubble at a known location. The source is located with the use of acoustic data collected with hydrophones and analyzed using signal processing techniques. To verify the accuracy of the acoustic scheme, the events are simultaneously monitored visually with the use of a high speed camera. Once refined testing will be conducted in a water tunnel. This research was sponsored by the Naval Engineering Education Center (NEEC).

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