

Abstract Submitted
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Measurements of Jet Effect on a Ventilated Cavity¹ IVAN KIRSCHNER, Applied Physical Sciences Corp, MICHAEL MOENY, MICHAEL KRANE, MICHAEL KINZEL, Applied Research Laboratory, Penn State University — An experimental study was performed to evaluate some of the claims of Paryshev (2006) regarding changes to ventilated cavity behavior caused by the interaction of a jet with the cavity closure region. The experiments, conducted in the 1.22m diameter Garfield Thomas Water Tunnel, were performed for a 0.0222 EDD to tunnel diameter ratio, $Fr = 14.5$ and 26.2 . The model consisted of a converging-section nozzle mounted to the base of a 27.9mm 37° cone cavitator placed on the tunnel centerline at the end of a 138.4mm long streamlined strut. A ventilated cavity was formed over the model. Then an air jet, issuing from a converging nozzle, was initiated. Changes to cavity behavior were quantified in terms of cavitation number, thrust-to-drag ratio, and stagnation pressure ratio at the jet nozzle. The results show that, while the overall trends predicted by Paryshev were observed, the data did not fully collapse, suggesting that many of the effects neglected by Paryshev's model have measureable effect.

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