

Abstract Submitted
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Vortex Cavitation on Delta-Wings HARISH GANESH, STEVEN CECCIO, University of Michigan, Ann Arbor — Vortex cavitation experiments were carried out on delta wing with 70 degrees sweep back at various attack angles in a re-circulating water tunnel. The flow speed was maintained at a constant value of 4 m/s and the free stream pressure was varied to observe cavitation events ranging from inception to fully attached bubbles. By changing the free stream cavitation number two types of bubbles were observed; stationery bubbles that occupied an axial position for a sufficient time and travelling bubbles that convected with the flow. Variation of the vortex properties on a delta wing facilitates the occurrence of these two bubble types. Stationery bubbles, by the virtue of their equilibrium position and shape provide information about the axial and radial gradients of the flow respectively. A simple analysis based on equilibrium of a stationery bubble is used to illustrate the relation between the vortex properties and the stationery bubble properties. Acoustic signature of these bubbles were also measured and compared. Dye injection was also used to determine the breakdown location and it was found that vortex cavitation had no influence on the breakdown location. Finally, a relationship between stationery bubbles and the vortex properties is proposed based on the measurements and analysis.

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