Abstract Submitted
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Investigation of Cavitation Regimes Using Large Eddy Simulations[1] MRUGANK BHATT, KRISHNAN MAHESH, University of Minnesota — Cavitation occurs over different regimes, ranging from inception to massive regions of vapor. We use LES to examine the different regimes of cavitation for i) partial cavitation over a wedge and ii) cavitation over a marine propeller. Cavitation over a wedge is simulated at Re = 200,000 and b=2.47, 1.89 and 1.78 demonstrating respectively the incipient, the transitory and the periodic regimes. Cavitation over a five bladed marine propeller (P4381) is studied at Re = 894,000 and = and 0.6showing respectively the wetted and thrust breakdown conditions. The performance of a homogeneous mixture approach is assessed for capturing wetted conditions over a propeller and small scale vapor regions in the incipient cavitation over a wedge. Also the large regions of vapor resulting in the transitory and the periodic regimes over a wedge and thrust breakdown conditions over a propeller are studied. The flow field obtained using LES in each regime is discussed.

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Mrugank Bhatt
University of Minnesota

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