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Bubbly flow around microcantilevers.[1] MATTHEW STEGMEIR, ELLEN LONGMIRE, University of MN Dept. of Aerospace Engineering and Mechanics — In the current study, we investigate the flow of bubbles that impact cantilever obstacles with thickness 26-38μm in a confined channel. The cantilevers are mounted in a vertical channel with thickness of 1-4mm, width of 10mm, and length of 75mm. Steady flows upward with channel Reynolds numbers based on mean fluid velocity 0-2000 are established. Bubbles of diameter 40-1000μm are introduced upstream of the test section. Bubble number density can be controlled independent of liquid velocity. Bubble motion in the vicinity of the cantilever obstacle is observed using a microscope equipped with a high frame rate camera. Observations are made perpendicular to and along the length of the cantilevers using reflected white light. Preliminary results show three types of interactions: bubbles bounce off of the cantilever, are sliced in two, or exhibit significant deformation around the cantilever before rebounding and continuing on one side. The flow studies are part of a larger research program examining the effect of fluid properties and flow on the reliability and performance of vibrating beams.

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