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Bubble impacts with microcantilevers.[1] MATTHEW STEGMEIR, ELLEN LONGMIRE, Aerospace Engineering and Mechanics, University of Minnesota, MUBASSAR ALI, SUSAN MANTELL, Mechanical Engineering, University of Minnesota — In the current study, we investigate bubbles in laminar channel flows impacting microcantilever obstacles. Static and resonating cantilevers instrumented with integrated strain gages are mounted perpendicular to the mean flow in a vertically-oriented channel with thickness 2mm, span 10mm, and length 585 mm. Steady, fully-developed upward flows with channel Reynolds numbers based on mean fluid velocity and hydraulic diameter of 0-2500 are considered. Bubbles of diameter 200-1000μm are introduced upstream of the test section, and impacts are observed using a microscope equipped with a high frame rate camera. Observations are made along the length of cantilevers backlit with white light. Strain gage signals are monitored and correlated to impact events. The effect of obstacles on bubble motion and deformation as well as the effect of bubble impacts on the cantilever will be discussed. The flow studies are part of a larger research program examining reliability and performance of vibrating microbeams.

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