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Effects of bubble length and excitation frequency on micro propulsion by oscillating bubble[1] JIAN FENG, SUNG KWON CHO, University of Pittsburgh — Previously, we have showed that an oscillating micro bubble column trapped in a one-end open channel can generate a propulsion force in the presence of an acoustic excitation [1]. The main mechanism for this propulsion is generation of asymmetric flows within the cyclic period of excitation. In particular, the amplitude of the bubble interface oscillation at the open end of the channel seems to be highly correlated to the propulsion strength. In addition, the oscillation amplitude highly depends on the excitation frequency as well as the bubble length. This means that the frequency and bubble length can be key parameters for controlling the propulsion strength. In this talk, we discuss how the bubble length and excitation frequency affect the micro propulsion. As the bubble length and the excitation frequency are varied, the oscillation amplitude, the strength of generated flows near the oscillating bubble and the propulsion speed are measured. Based on the measurements, the relation of these parameters with the propulsion strength is investigated.

[1] Jian Feng and Sung Kwon Cho, MEMS2013 Conference, pp. 63-66.

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Sung Kwon Cho
University of Pittsburgh

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