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Bubble Transport through Micropillar Arrays[1] KENNETH LEE, University of California, Berkeley, OMER SAVAS, University of California at Berkeley — In current energy research, artificial photosynthetic devices are being designed to split water and harvest hydrogen gas using energy from the sun. In one such design, hydrogen gas bubbles evolve on the catalytic surfaces of arrayed micropillars. If these bubbles are not promptly removed from the surface, they can adversely affect gas evolution rates, water flow rates, sunlight capture, and heat management of the system. Therefore, an efficient method of collecting the evolved gas bubbles is crucial. Preliminary flow visualization has been conducted of bubbles advecting through dense arrays of pillars. Bubbles moving through square and hexagonal arrays are tracked, and the results are qualitatively described. Initial attempts to correlate bubble motion with relevant lengthscales and forces are also presented. These observations suggest how bubble transport within such pillar arrays can be managed, as well as guide subsequent experiments that investigate bubble evolution and collection.

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