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An experimental study of a quasi-two dimensional rising foam NORA BENNANI, AKIKO FUJIWARA, SHU TAKAGI, YOICHIRO MATSUMOTO, Department of Mechanical Engineering, FEL, University of Tokyo — Motivated by the use of the flotation process to clean a non-homogeneous liquid, we here report on an experimental study of quasi-two dimensional flowing foam. Conditions are free-drainage which is driven by gravity and capillarity. The coarsening process, which is due to the aging of the foam, is also occurring, changing the general shape of this polydispersed foam cells. Tea seed saponin was used as surfactant, and Rhodamine-B fluorescent particles were tracked using the Particle Tracking Velocimetry technique. Experiments were performed in an acrylic tank filled with tap water (height H= 1m, width W= 0.15 m and Depth D= 8mm). The air was injected from its bottom part with a fixed flow rate, and went through a porous plate (size of the pores was 10μm), and created 3mm diameter non-spherical bubbles. The void fraction, in the liquid phase, was estimated to be around 1%. Fluorescent particles were beforehand added in the liquid phase in order to trace wastewater particle motion. The generated foam gas cells sizes were in the range of 0.5 to 5 cm, depending on the surfactant concentration and the coarsening process. The behaviours of these particle tracers and of the liquid, with these herein foaming conditions, are here presented and are compared to available data and theories.

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