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Removing biofilm using bubbles EHSAN ESMAILI, PRANAV SHUKLA, SUNGHWAN JUNG, Virginia Tech — Scrubbing dynamics of a bubble impacting a tilted wall has been studied through a combination of experimental observations and computational validation. We experimentally characterize the impact and slide of a single bubble against a solid substrate. A force balance that includes buoyancy, hydrodynamic inertia & drag, bubble deformation & rotation, and film force has been modeled numerically at different tilted angles. We found that experimental observations were in good agreement with results from the computational model. Moreover, shear (or scrubbing) force on the wall has been calculated and compared with bacterium adhesion forces in order to evaluate the potential of a bubble-impacting method for removing biofilm from different surfaces.

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