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Detachment of Sessile Droplets in Immiscible Fluids Using Electrowetting JIWOO HONG, SANG JOON LEE, Pohang University of Science and Technology (POSTECH) — The detachment (or removal) of droplets from a solid surface is an indispensable process in numerous practical applications. Here we firstly detach sessile droplets in immiscible fluids from a hydrophobic surface by electrowetting. The critical conditions for droplet detachment are determined by exploring the retracting dynamics for a wide range of driving voltages and physical properties of fluids. The relationships between physical parameters and dynamic characteristics of retracting and jumping droplets, such as contact time and jumping height, are also established. The threshold voltage for droplet detachment in oil with high viscosity is largely reduced by electrowetting actuations with a square pulse. Finally, by using DC and AC electrowetting actuations, we demonstrate the detachment of oil droplets with very low contact angle on a hydrophobic surface in water.

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