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Effects of Electric Fields on Coalescence of Drops at Planar Interfaces PIROUZ KAVEHPOUR, HAMARZ ARYAFAR, Mech. and Aero. Eng., UCLA — Although electro-coalescence has applications in such fields as oil purification, lab on a chip, and mass spectroscopy, the dynamics involved within it are not fully understood. In series of experiments, we investigate the effects of an electric field on coalescing fluid bodies. A neutrally-charged droplet is deposited inside a layer of silicone oil slightly above a planar silicone oil-drop fluid interface. By introducing a DC electric field, we apply additional forces to the interface and droplet. In most cases, the presence of the electric field causes the droplet to initiate coalescence. The effect of this additional field in conjunction with the effect of other physical properties of liquids such as viscosity and interfacial tension are studied by utilizing a digital high-speed camera. The characteristics of this phenomenon are compared with those of equivalent systems in absence of the electric field.

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