Abstract Submitted
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Coalescence in low viscosity liquids SARAH CASE, SIDNEY NAGEL, The University of Chicago — The coalescence of two fluid drops is an extremely rapid process. To study very early stages of coalescence, we employ a modified electrical method[1]. A drop of aqueous NaCl solution is suspended in air above a flat surface of the same solution. A constant voltage is maintained across the system. The flat surface is raised until it touches the drop at which point a rapidly widening bridge forms between them. During coalescence, we measure the resistance of the system, thus obtaining the time dependence of the ratio r^2/L, where r is the characteristic bridge radius and L is its characteristic length. Previous photographic studies[2] have reported a $20 - 60$ μs lag between the apparent initiation of coalescence and initiation of electrical contact used to trigger the camera. However, we observe a smooth evolution in the resistance after the initiation of electrical contact. By combining high-speed imaging with our electrical measurements, we are able to address the cause of this discrepancy.

[1] J. C. Burton, J. E. Rutledge, and P. Taborek, Phys. Rev. Lett., 92, 244505 (2004)
[2] S. T. Thoroddsen, K. Takehara, and T. G. Etoh, J. Fluid Mech., 527, 85-114 (2005)

Sarah Case
The University of Chicago

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