

Abstract Submitted  
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**Coalescence of Drops Due to a Constant Force Interaction in a Viscous Quiescent Fluid** JOHN FROSTAD, University of California, Santa Barbara, ALEXANDRA PAUL, Saarland University, GARY LEAL, University of California, Santa Barbara — A Cantilevered-Capillary Force Apparatus is used to study the time scale for the coalescence of two droplets compressed together with a constant force. Power-law trends for the coalescence time as a function of droplet radius and compression force are measured. The measurements are compared against several different scaling theories from the literature. One of the existing theories is found to correctly predict the dependence on the droplet radius, but all of the theories over-predict the dependence on the force. A transition is also measured in the coalescence process from a predominately deterministic to a predominately stochastic process. A qualitative explanation for this transition is provided via scaling arguments.

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