

Abstract Submitted
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Boundary Integral Simulations of Drop Coalescence L. GARY LEAL, YOSANG YOON, FABIO BALDESSARI, University of California, Santa Barbara — We report on boundary integral simulations of the flow-induced coalescence of a pair of equal size drops undergoing a head-on collision in an axisymmetric extensional flow. For the small capillary numbers that are relevant to the coalescence of drops in the 10-50 micron diameter range, a direct comparison can be made between the theory and experimental data, including both head-on and glancing collisions. In the latter case, the time-dependent force due to rotation of the drop pair can be mimicked via head-on collisions with a time-dependent velocity gradient. This analogy allows us to study the mechanism for coalescence in cases where it is observed experimentally to occur during the latter half of a collisions, after the hydrodynamic force has begun to pull the drops apart.

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