

Abstract Submitted
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Binary Drop Coalescence in Liquid/Liquid Systems JUNGYONG KIM, ELLEN LONGMIRE, University of Minnesota — Drop pairs of water/glycerin mixture were injected horizontally into silicone oil and, due to gravitational effects, traveled on downward trajectories before colliding. Flow visualization and PIV measurements were obtained in index-matched fluids to characterize coalescence and rebounding behavior. Planar PIV was used to examine large-scale drop motion. In a dual field measurement, stereo PIV and planar long distance microscope PIV were used for resolving larger and smaller scale motion respectively. Experiments were performed for Weber numbers [We] in the range of 1-50. Higher We caused stronger drop deformation and enhanced interface instability, leading to film rupture. By adjusting the initial separation distance and drop volume, trajectory angles could be controlled somewhat. Steeper collision angles encouraged rebounding as opposed to coalescence. Velocity and vorticity fields of the impact zone will be discussed in relation to coalescence and rebounding behavior for several cases

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