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Surfactant effect on drop coalescence and film drainage hydrodynamics WEHELIYE WEHELIYE, MAXIME CHINAUD, VICTOR VOULGAROPOULOS, PANAGIOTA ANGELI, Department of Chemical Engineering, University College London, Torrington Place, London, WC1E 7JE — Coalescence of a drop on an aqueous-organic interface is studied in two test geometries A rectangular acrylic vessel and a Hele-Shaw cell (two parallel plates placed 2mm apart) are investigated for the experiments. Time resolved Particle Image Velocimetry (PIV) measurements provide information on the hydrodynamics during the bouncing stage of the droplet and on the vortices generated at the bulk fluid after the droplet has coalesced. The velocity field inside the droplet during its coalescence is presented. By localizing the rupture point of the coalescence in the quasi two dimensional cell, the film drainage dynamics are discussed by acquiring its flow velocity by PIV measurements with a straddling camera. The effect of surface tension forces in the coalescence of the droplet is investigated by introducing surface active agents at various concentrations extending on both sides of the critical micelle concentration.

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