

Abstract Submitted
for the DFD07 Meeting of
The American Physical Society

Effect of liquid transparency on laser-induced-motion of drops

ROHIT SHUKLA, KHALED SALLAM, Oklahoma State University — An Experimental investigation of the role of liquid transparency in controlling laser-induced-motion of liquid drops is carried out. Droplets with diameters of 1– 4 mm were propelled on a hydrophobic substrate using pulsed-laser beam (532 nm, 10 Hz, 5-10 mJ/pulse) with 1 mm diameter fired parallel to the substrate. The test liquid was distilled water whose transparency was varied by adding different concentrations of Rhodamine 6G dye. High speed imaging was used to observe the motion of the drops. Measurements include direction of motion, distance traveled before the drops come to rest, and drop acceleration at the start of the motion. The motion of both transparent and opaque drops was dominated by thermal Marangoni effect. The present results show that direction of motion depends on the drop transparency; opaque drops moved away from the laser beam, whereas transparent drops moved at small angles toward the laser beam. This is plausible because the laser beam was absorbed near the front face of opaque drops, whereas the laser beam was focused near the rear face of transparent drops.

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Date submitted: 06 Aug 2007

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