

Abstract Submitted  
for the DFD16 Meeting of  
The American Physical Society

**Coalescence of a Drop inside another Drop** VIVEK MUGUNDHAN, ZHEN JIAN, FAN YANG, ERQIANG LI, SIGURDUR THORODDSEN, King Abdullah Univ of Sci Tech (KAUST) — Coalescence dynamics of a pendent drop sitting inside another drop, has been studied experimentally and in numerical simulations. Using an in-house fabricated composite micro-nozzle, a smaller salt-water drop is introduced inside a larger oil drop which is pendent in a tank containing the same liquid as the inner drop. On touching the surface of outer drop, the inner drop coalesces with the surrounding liquid forming a vortex ring, which grows in time to form a mushroom-like structure. The initial dynamics at the first bridge opening up is quantified using Particle Image Velocimetry (PIV), while matching the refractive index of the two liquids. The phenomenon is also numerically simulated using the open-source code Gerris. The problem is fully governed by two non-dimensional parameters: the Ohnesorge number and the diameter ratios of the two drops. The validated numerical model is used to better understand the dynamics of the phenomenon. In some cases a coalescence cascade is observed with liquid draining intermittently and the inner drop reducing in size.

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Date submitted: 31 Jul 2016

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