

Abstract Submitted  
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**Experiments on the harmonic response of coupled droplets to pressure forcing** CHRISTOPHER TILGER, JOSEPH OLLES, AMIR HIRSA, Rensselaer Polytechnic Institute — The dynamic response of a coupled droplet system to sinusoidal forcing pressure was studied. The system consists of two droplets, each with pinned contact lines, coupled through a conduit. Applications of the coupled droplet system include fast focusing liquid lenses and liquid adhesion devices. The millimeter-scale pinned-contact lines associated with the coupled droplets minimize viscous dissipation and allow capillarity to maintain spherical caps. Phase lag, averaged over the period, between the motion of the droplets and the pressure signal was measured using a high speed imaging system. The instantaneous phase behavior of the system was also determined, describing the droplet configuration with respect to the input forcing. Finally, oscillation lag times associated with starting and stopping transients were determined along with damping coefficients for coupled droplets of different volumes.

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