

Abstract Submitted
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Liquid bridges in complex geometries: Equilibrium shape metamorphosis using electrowetting¹ DAVOOD BARATIAN, ANDREA CAVALLI, DIRK VAN DEN ENDE, FRIEDER MUGELE, Univ of Twente — The equilibrium morphology of liquid drops exposed to geometric constraints can be rather complex. Even for simple geometries, analytical solutions are scarce. We investigate the equilibrium shape and position of liquid drops confined in the wedge between two solid surfaces. Using electrowetting, we control the contact angle and thereby manipulate the shape and the equilibrium position of aqueous drops in ambient oil. In the absence of contact angle hysteresis and buoyancy, we find that the equilibrium shape is given by a truncated sphere, prior to filling the wedge corner, at a position that is determined by the drop volume and the contact angle. At this position, the net force between drop and the surfaces vanishes. The effect of buoyancy gives rise to substantial deviations from this equilibrium configuration which we discuss it as well. We elegantly show how the geometric constraint and electrowetting can be used to position droplets inside a wedge in a controlled way, without mechanical actuation.

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