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Stability and motion of liquid bridges between non-parallel surfaces[1] MOHAMMADMEHDI ATAEI, York University, HUANCHEN CHEN, TIAN TANG, University of Alberta, ALIDAD AMIRFAZLI, York University — Squeezing and stretching liquid bridges formed by approaching upper surface to a sessile drop deposited on a lower surface, is frequently observed in nature and industry, e.g. printing. However, most literature focuses on liquid bridges between two parallel surfaces. In practice, bridges can also be formed between surfaces with an angle αbetween them. Here, the effect of α on the stability and motion of the bridge was studied experimentally. Different pairs of surfaces from hydrophilic to hydrophobic, along with different contact angle hysteresis (CAH) values, were used to study the effect of surface contact angle (SCA) and CAH on the bridge stability and motion. Unlike bridges between parallel surfaces, a stable bridge may not be formed when α is larger than a threshold value α_c. Instead, when bridge forms, it can undergo unstable movement towards the ends of surfaces. Shown in this study, α_c is governed by both SCA and CAH (typically missed in literature). Also, during the squeezing and stretching cycles, because of α, bulk motion of the liquid bridge along the surfaces can be observed. The direction and magnitude of the bulk motion is found to be related to SCA, CAH and α.

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