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Capillary migration of large confined super-hydrophobic drops in wedges[1] LOGAN TORRES, MARK WEISLOGEL, SAM ARNOLD, Portland State University — When confined within an interior corner, drops and bubbles migrate to regions of minimum energy by the combined effects of surface tension, surface wetting, and corner geometry. Such capillary phenomena are exploited for passive phase separation operations in micro-fluidic devices on earth and macro-fluidic devices aboard spacecraft. Our study focuses on the migration of large inertial-capillary drops confined between two planar super-hydrophobic surfaces. In our experiments, the near weightless environment of a drop tower produces Bo $<<1$ for drop volumes O(10mL) with migration velocities up to 10 cm/s. We observe transient power law behavior as a function of drop volume, wedge angle, initial confinement, and fluid properties including contact angle. We then further demonstrate how the experiment method may be employed as a large horizontal quiescent droplet generator for studies ranging from inertial non-wetting moving contact line investigations to large geyser-free horizontal drop impacts.

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Logan Torres
Portland State University

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