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New Large Length Scale Capillary Fluidics Investigations Using a Drop Tower[1] MARK WEISLOGEL, ANDREW WOLLMAN, BRENTLEY WILES, Portland State University — Drop Towers provide brief terrestrial access to microgravity environments. When exploited for capillary fluidics research, the drop tower allows for unique control over an experiment's initial conditions which can enable, enhance, or otherwise improve methods to study capillary flows and phenomena at significantly larger length scales than can be achieved on the ground. In this work a new, highly accessible, 2.1 s tower is introduced for such research. Enabled in part by simple macro-fabrication methods, a variety of new demonstrative experiments are presented for purely capillarity-driven flows leading to droplet ejections, bubble ingestions, sinking flows, particle injections, and multiphase flows. Due to the repeatability of the passive flows, each experiment may be used in turn as a means to study other phenomena and forward-looking research themes are suggested that include large length scale passive phase separations, heat and mass transfer, droplet dynamics, combustion, and more.

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