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Capillary-Based Liquid Micro/Nano Droplet Deposition¹ ISKANDER AKHATOV, ARTUR LUTFURAKHMANOV, GREGORY LOKEN, DOUGLAS SCHULZ, North Dakota State University — Liquid droplet deposition through a capillary onto a substrate is studied. The application of pressure into the capillary causes a liquid meniscus to form at the outlet. Touching the substrate with the liquid meniscus and subsequent capillary retraction gives liquid deposition on the substrate. Theoretical and experimental studies of the steady liquid bridge structure between the capillary and substrate identified the range of parameters when deposition of small droplets (no blot) can be performed. Experiments revealed that in this range of parameters the size of deposited liquid droplets is less than 10-15% of inner diameter of the capillary. A logical next step in the demonstration of this approach is to translate from the microscale to the nanoscale using a nanocapillary navigated by a scanning tunneling microscope.

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