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Experimentally observed flows inside inkjet-printed aqueous rivulets VADIM BROMBERG, TIMOTHY SINGLER, SUNY Binghamton — Understanding the flow inside sessile liquid masses of different shapes is important in a variety of solution-based material deposition and patterning processes. We investigated the shape evolution and internal flow of inkjet-printed aqueous rivulets of finite length using optical microscopy. Rivulets were formed by printing a pre-determined number of drops at controlled frequency and spatial overlap. Capillary-driven rivulet breakup into individual drops was inhibited by chemical modification of substrates that resulted in controlled contact angle hysteresis with zero static receding contact angle. A variety of novel capillary- and evaporatively-driven flows were identified using fluorescent particles as flow tracers. Flow regimes were investigated as a function of advancing contact angle, deposition parameters, and fluid properties.

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