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Length scale effect on thin film drainage during droplet deposition inside microchannels AMY SHEN, BEN STEINHAUS, Washington University — When a droplet in a liquid-liquid system approaches a solid surface a thin liquid film forms between the droplet and the surface. This thin film drains until an instability forms, resulting in the coalescence of the droplet and the surface. A microfluidic device is utilized to investigate the effects of length scale on the drainage of these thin films on both hydrophobic and hydrophilic surfaces. Droplets ranging in size from microns to millimeters are examined. The rate of film drainage, as well as the time to coalescence, are compared between millimeter and micron scale droplets. Results show that van der Waal's and electrostatic forces become dominate over viscous forces at small length scales.

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