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Elastocapillary Flows in Flexible Tubes THERESA HOBERG, MIT, EMILIE VERNEUIL, ESPCI, MIT, ANETTE HOSOI, MIT — Interactions between capillary and elastic effects have sparked interest for a variety of applications, from micro- and nano-scale manufacturing to biological systems. In this work, we investigate capillary flows in extremely flexible, millimeter-scale cylindrical elastic tubes, and examine the interaction between surface tension and elastic effects. We present experimental results for capillary rise and evaporation experiments in different regimes, and demonstrate that surface tension effects on sufficiently flexible tubes can cause them to collapse and coalesce spontaneously through non-axisymmetric buckling. The deformations of the tube wall and their dynamic impact on capillary-driven fluid flow are measured in different regimes, and equilibrium states are characterized. Experiments are compared with theoretical predictions.

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