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Shapes of non-circular drops on inclined hysteretic surfaces NACHIKETA JANARDAN, MAHESH PANCHAGNULA, Indian Institute of Technology Madras — The shapes of non-circular drops on inclined hysteretic surfaces have been studied experimentally. The drops have an initially elliptical triple line and are formed by allowing two circular drops to coalesce. The drop is initially at rest on a horizontal substrate at different orientations to the tilt axis. This substrate is then tilted and the drop is allowed to move down the inclined substrate. The moving and sliding angles are measured as a function of the initial triple line topology and surface characteristics. The moving angle is the first critical inclination angle at which the triple line is on the verge of being deformed. The sliding angle is the second critical inclination angle at which the entire drop is in a state of impending motion. It is seen that the drop shape, sliding and moving angle are dependent on the initial conditions and the initial orientation of the drop. The moving angle, which is an indication of the hysteresis force attempting to keep the drop from sliding, is shown to scale with the triple line length, as well as the contact angle hysteresis. In addition, the configurations of the drops during the evolution process are studied to establish the mechanism for the sliding process.

> Mahesh Panchagnula Indian Institute of Technology Madras

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