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Non-Spherical Droplets of Diblock Copolymer: Equilibrium Shape and Spreading Kinetics ANDREW B. CROLL, MICHAEL V. MASSA, KARI DALNOKI-VERESS, Department of Physics & Astronomy and the Brockhouse Institute for Material Research, McMaster University, Hamilton, Canada, MARK W. MATSEN, Department of Physics, University of Reading, Reading, UK — Conventional liquid droplets minimize surface energies by acquiring the shape of a spherical cap. In the case of symmetric diblock copolymers microphase separation yields the additional energy constraint of a lamellar microstructure. We present a study of droplets of symmetric polystyrene-b-poly (methyl methacrylate) (PS-b-PMMA), which consist of stacked lamellar disks. Ordered PS-b-PMMA droplets are found to have a non-spherical shape that can be nearly conical under certain conditions. Most significantly, this droplet shape becomes spherical upon passing through the order disorder transition. The near conical equilibrium droplet shape can be understood from a simple model with a repulsive interaction between the lamellar edges in adjacent disks. Furthermore, droplet spreading is found to deviate from Tanner's law in a predictable way.

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