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The wrinkle transition of a sheet on a drop ROBERT SCHROLL, BENNY DAVIDOVITCH, HUNTER KING, NARAYANAN MENON, Physics Department, University of Massachusetts — A thin sheet subject to confinement will wrinkle in order to relieve compressive stress. We discuss the case of a circular sheet living on the surface of a liquid drop. The pressure of the drop forces the sheet to be non-planar, which may induce confinement along the outer edge of the sheet. We show that, in the limit of very thin, highly bendable sheets, the system is governed by a single confinement parameter. This parameter determines if and where wrinkles appear on the sheet. Comparison to experimental results provides the first detailed confirmation of a new far-from-threshold theory to describe such ultra-thin sheets. According to this model, the transition to the wrinkled state represents the loss of axisymmetry in the height field, while the stress field maintains its symmetry.

Robert Schroll
Physics Department, University of Massachusetts

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