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A curtain-type problem: pattern formation on uniaxially confined sheet with deformed edge ROBERT SCHROLL, Physics Dept., UMass Amherst, ELENI KATIFORI, Center for Studies in Physics and Biology, Rockefeller University, BENNY DAVIDOVITCH, Physics Dept., UMass Amherst — An elastic sheet subject to uniaxial compression will buckle out of plane. In order to minimize the bending energy, the wrinkled shape that is created will have as large a wavelength as possible. This behavior can be frustrated by constraining one edge of the sheet to smaller amplitude, as is often the case with curtains, which forces a shorter wavelength near the constrained edge. Narrow strips will adopt this shape across their width, while wider sheets exhibit a transition pattern between wrinkles of smaller and larger wavelengths. We will present simulations illustrating this behavior. We will discuss the mechanisms that govern the transition between the translationally-symmetric and -unsymmetric shapes and examine the characteristic features of the unsymmetric shape. Additionally, we will show how tension applied transverse to the compression direction affects the emergent pattern. We acknowledge support from the NSF-supported MRSEC on Polymers at UMass (DMR-0820506).

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