

Abstract Submitted
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Elasticity and gravity competing in a 2D system P. MELLADO, Johns Hopkins University, A. CONCHA, Johns Hopkins University — We propose a minimal model for studying the consequences of the competition between elasticity and gravity on a surface. The model describes a cylindrically symmetric membrane composed of an elastic substrate and a stiff crust that experience a gravitational field directed radially inward. Under certain conditions an instability that breaks the initial symmetry can appear. When a stretching energy for the crust is introduced and an appropriate geometrical constraint on the system is imposed, an exotic periodic pattern forms. We provide an analytical solution to the model and show that while the stretching energy is responsible for the periodic pattern, faults in the stiff crust emerge generically when elasticity and gravity are competing. Possible implications in geology are discussed.

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