

Abstract Submitted
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Nonlinear response of tensed membranes PEKER MILAS, BENNY DAVIDOVITCH, Physics Dept., UMass Amherst — We study the response of elastic membranes under tension T , to localized normal forces F . Focusing on simple geometries, characterized by translational or radial symmetries, we calculate the membrane shape for a range of values of F and T by numerically solving the appropriate FvK equations. We find that the linear regime, where membrane displacement is proportional to F , vanishes in the asymptotic limit $F/T \ll 1$, and characterize scaling properties of the resulting nonlinear response. We discuss the relevance of our results to the puzzling scaling behavior of the length of radial wrinkles, recently found in “drop on membrane” experiments (Huang *et al.* Science 2007).

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