

# Wrinkling of a thin elastic sheet on a compliant sphere

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Wrinkling of thin elastic sheets can be viewed as a way how they avoid compressive stresses. While the question of where the wrinkles appear is (mostly) well-understood, understanding properties of wrinkling is not trivial. Considering a variational viewpoint, the problem amounts to minimization of an elastic energy, which can be viewed as a non-convex membrane energy singularly perturbed by a higher-order bending term. To understand the global minimizer (ground state), the first step is to identify its energy, in particular how it depends on the small physical parameter (thickness). I will focus on one specific example – a disk-shaped thin elastic sheet bonded to a compliant sphere. There the leading-order behavior of the energy determines the macroscopic deformation of the sheet and provides insight about the length scale of the wrinkling. The next-order correction then provide insight about how the wrinkling pattern should vary across the film, and is in particular related to the form of transition between different wrinkling patterns.