

Understanding Wrinkles

Wrinkling patterns are ubiquitous in elastic sheets of various types: plastic wraps, metallic foils, human skins, or plant leaves. Yet, the strong dependence of these patterns on physical parameters, such as the thickness of the sheet and the stretching forces, has not been well understood. A recent theoretical work, supported by the Petroleum Research Fund, addresses this problem. Focusing on the “simplest yet nontrivial” set-up that gives rise to wrinkles (left figure), the researchers identified generic parameters – termed *bendability* and *confinement*, that determine how various features of the wrinkled zone vary in a stretched sheet (right figure). The methodology developed in this study could be used to understand wrinkling and other morphological types in simple and complex geometries.

(B. Davidovitch, R.D. Schroll, D. Vella, M. Adda-Bedia, E. Cerda, PNAS 2011)

