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Building blocks for the shapes of confined elastic sheets[1] ROBERT SCHROLL, UMass Amherst, ELENI KATIFORI, Rockefeller University, BENNY DAVIDOVITCH, UMass Amherst — Several configurations, such as d-cones, minimal ridges, and developable patches, occur regularly in the configuration of elastic sheets. We dub such features "building blocks." Here, we study elastic sheets confined in a manner that prohibits the sheet from taking on a single-buckle shape. We find not only building blocks where stress focuses, reminiscent of d-cones, but also "diffuse-stress" regions. The former is characterized by a geometrical constraint (inextensibility) while the latter is governed by a mechanical constraint: the dominance of a single component of the stress tensor. We characterize how boundary conditions and applied tension select which building blocks appear and discuss implications for the curtain problem.

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Robert Schroll
UMass Amherst

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