Mechanical response of creases network in thin sheets BENJAMIN
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BEDIA, LPS-ENS, PMMH/LPS COLLABORATION — In a recent study [Thiria
& Adda-Bedia, PRL, 2011], it has been shown that the local plastic zone (crease)
created during thin-film folding exhibits a logarithmic mechanical response typical
to aging. It was found that the related relaxation processes could be described by an
Arrhenius law with a typical time scale intrinsic to the material. Here we present an
extension to this study by adding collective behaviors and topology (or geometry)
to the system . The systems considered consist in in-line series of folds and origami-
like 2D patterns. We present the global behavior and mechanical properties (aging,
rigidity) of multi-folded thin sheets as a function of the experimental parameters
(material, thickness, fold preparation and geometrical characteristic).

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Date submitted: 16 Nov 2012   Electronic form version 1.4