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One Bend, Two Bend: Stepping Towards a Complex Folded Object. ANDREW CROLL, DAMITH ROZAIRO, North Dakota State Univ — Crumpled thin films form a very unique jammed state of matter. They are both lightweight and ridged, suggesting broad industrial relevance. While researchers have theorized over the origins of these properties, very little experimental work has been performed directly collecting both structural and material properties in concert. Without testing the strength and interplay of the basic structures making up the larger object (bends, folds, and d-cones) it is difficult if not impossible to completely trust the origin of various material properties and processes (modulus, aging behaviour). Here we show that laser scanning confocal microscopy can be used to image geometry directly in concert with the recording of traditional macroscopic measurements (e.g. force vs displacement). Specifically, we examine the force/displacement behaviour in systems of 1 to N folds created with well understood polymeric materials.

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