Tech Science Press

PROCEEDINGS

Tensile Buckling of a Stretched Sheet

Mingchao Liu[1,2,*], Kexin Guo[2], Marc Suñé[3], K Jimmy Hsia[2] and Dominic Vella[3]

[1]Department of Mechanical Engineering, University of Birmingham, Birmingham, B15 2TT, United Kingdom
[2]School of Mechanical and Aerospace Engineering, Nanyang Technological University, Singapore, 639798, Singapore
[3]Mathematical Institute, University of Oxford, Oxford, OX2 6GG, United Kingdom
*Corresponding Author: Mingchao Liu. Email: m.liu.2@bham.ac.uk

ABSTRACT

The mechanics of slender elastic sheets poses a rich collection of geometrically nonlinear behaviours [1,2]. Here, we present a new mode of global deformation induced by uniaxial stretching of an elastic sheet. We show that a global buckling in tension can occur and suggest it may be an organizing principle behind previous observations.

KEYWORDS

Elastic sheet; tensile buckling; global deformation

Conflicts of Interest: The authors declare that they have no conflicts of interest to report regarding the present study.

References

1. Cerda, E., Mahadevan, L. (2003). Geometry and Physics of Wrinkling. *Physical Review Letters, 90,* 074302.
2. Barois, T., Tadrist, L., Quilliet, C., Forterre, Y. (2014). How a Curved Elastic Strip Opens. *Physical Review Letters, 113,* 214301.