

Abstract Submitted  
for the MAR11 Meeting of  
The American Physical Society

**Revisiting the curvature cancellation in forced thin sheets**<sup>1</sup> JIN WANG, THOMAS WITTEN, University of Chicago — We revisit the numerically observed spontaneous vanishing of mean curvature [1] on a developable cone or “d-cone” [2] made by pushing a thin elastic sheet into a circular container. The deflection of the d-cone is the distance by which the sheet is pushed into the container. We investigate the ratio of the two principal curvatures versus sheet thickness  $h$  over a wider dynamic range than was used previously, holding the deflection and radius fixed. Instead of tending towards 1 as suggested by previous work, we find that the ratio scales as  $h^{1/3}$ . Scaling arguments and geometric variants support this  $h^{1/3}$  finding. Thus the mean curvature does not vanish for very thin sheets as previously claimed.

[1] T. Liang and T. A. Witten, *Phys. Rev. E* **73**, 046604 (2006).

[2] E. Cerda, S. Chaieb, F. Melo, and L. Mahadevan, *Nature* **401**, 46 (1999).

<sup>1</sup>Supported by NSF award DMR 0820054.

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Date submitted: 06 Dec 2010

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