

Supplementary Material (SI) for the article:  
“Buckling patterns in biaxially pre-stretched bilayer shells:  
wrinkles, creases, folds and fracture-like ridges”

Rashed Al-Rashed,<sup>a</sup> Francisco López Jiménez,<sup>b†</sup> Joel Marthelot,<sup>b</sup> and Pedro M. Reis<sup>a,b</sup>

<sup>a</sup>*Department of Mechanical Engineering,  
Massachusetts Institute of Technology,  
Cambridge, MA 02139, USA*

<sup>b</sup>*Department of Civil and Environmental Engineering,  
Massachusetts Institute of Technology,  
Cambridge, MA 02139, USA*

## Supplementary Movies:

**SI Movie 1:** Representative example of the *wrinkling buckling pattern* in a sample with stiffness ratio  $\xi = 3.1$  and pre-stretch  $\lambda_o = 1.55$ . The sample was deflated at a (de)stretch rate of  $d\lambda^s/dt = -0.41$ . The video was taken 30 seconds from the start of the deflation process.

**SI Movie 2:** Representative example of the *ridges' buckling pattern* in a sample with stiffness ratio  $\xi = 1.5$  and pre-stretch  $\lambda_o = 1.83$ . The sample was deflated at a (de)stretch rate of  $d\lambda^s/dt = -0.41$ . The video was taken 60 seconds from the start of the deflation process.

**SI Movie 3:** Representative example of the *hierarchical ridges' buckling pattern* in a sample with stiffness ratio  $\xi = 2.52$  and pre-stretch  $\lambda_o = 2.36$ . The sample was deflated at a (de)stretch rate of  $d\lambda^s/dt = -0.41$ . The video was taken 60 seconds from the start of the deflation process.

**SI Movie 4:** Representative example of the *creases' buckling pattern* in a sample with stiffness ratio  $\xi = 0.7$  and pre-stretch  $\lambda_o = 1.83$ . The sample was deflated at a (de)stretch rate of  $d\lambda^s/dt = -0.41$ . The video was taken 75 seconds from the start of the deflation process.

**SI Movie 5:** Representative example of the *folds' buckling pattern* in a sample with stiffness ratio  $\xi = 0.4$  and pre-stretch  $\lambda_o = 2.36$ . The sample was deflated at a (de)stretch rate of  $d\lambda^s/dt = -0.41$ . The video was taken 120 seconds from the start of the deflation process.

**SI Movie 6:** highlights the hierarchical nature of ridges, which is more clearly seen at a slower (de)stretch rate. The sample has a stiffness ratio  $\xi = 3.1$  and pre-stretch  $\lambda_o = 2.36$ , and was deflated at a (de)stretch rate of  $d\lambda^s/dt = -0.027$ . The video was taken after the substrate stretch had relaxed to  $\lambda^s = 0.425$  from the pre-stretched state.

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<sup>†</sup>Present address: Ann and H.J. Smead Aerospace Engineering Sciences, University of Colorado, Boulder, CO 80309, USA.