## SUPPLEMENTARY MATERIAL FOR:

## Fluid-Gel Coexistence in Membranes under Differential Stress

Samuel Foley, Amirali Hossein, and Markus Deserno



Figure SI 1: Top-down simulation snapshot from a flip-fixed Cooke simulation with  $\delta n = 7\%$  showing the positions of lipids in the compressed monolayer. On the left, lipids are given color shading based on the value of their hexatic order parameter  $|\psi_6|$ , with dark blue being high and light green/yellow being low order. The right shows the same snapshot now colored based on HMM labeling as one of two discrete states. The dark purple coloring corresponds to the highly ordered phase (gel). Axes are in CG length units  $\sigma^*$ .

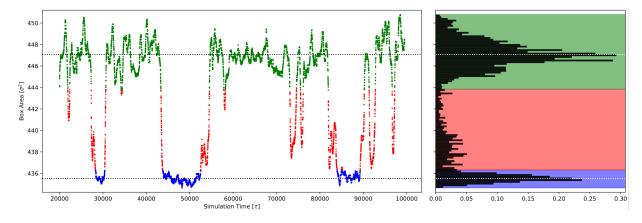


Figure SI 2: Time series of instantaneous membrane area from the  $\delta n = 9\%$  Cooke simulation in the main text. The histogram is shown to the right, along with the color coding based on the state determined via HMM.