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(G*) Bending a floating film using capillary forces

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Thin polymeric films have important applications including coatings for microelectronic devices. To study these nanoscale systems, we investigate the deformation of a floating glassy film where the inclusion of a liquid/solid contact line on top of the floating film introduces a capillary tug. The system is constructed by preparing a nanometric glassy film, which floats atop a thin supported liquid film. A third liquid film partially covers the assembly introducing the contact line boundary. Thus, at the stepped transition from a bilayer to a trilayer, the topmost liquid layer exerts a capillary pressure on the rigid layer. The contact line perturbs the rigid layer and in this geometry the bending of the intermediate rigid film mitigates the role of capillarity in a way that has not been previously studied. Atomic force microscopy is used to visualize the topology of these samples at the stepped border.

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