

Abstract Submitted  
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**Modeling folding of a bi-layered polymer network**<sup>1</sup> SVETOSLAV NIKOLOV, PETER YEH, ALEXANDER ALEXEEV, Georgia Institute of Technology — We use dissipative particle dynamics to develop a mesoscale computational model of a bi-layered polymer gel network that is responsive to specific external stimuli. The gel is modeled as an interconnected network of elastic filaments immersed in a viscous solvent. It is composed of two thin bonded layers, one of which swells in the presence of an external stimulus, while the other is passive. Thus, an application of a stimulus causes the gel sheet to bend and evolve into a three-dimensional shape. We employ this model to investigate shape changes and folding of geometrically and chemically patterned bi-layered gel networks in response to external stimuli. Specifically, we probe how complex, three-dimensional shapes can be produced from initially flat sheets of a responsive bi-layered gel.

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