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Time and temperature dependent wrinkling of stiff thin films on shape memory polymers YU WANG, KAI YU, JERRY QI, JIANLIANG XIAO, Department of Mechanical Engineering University of Colorado Boulder, MECHANICS OF MATERIALS TEAM — Shape memory polymers (SMPs) can remember two or more distinct shapes, and therefore can have a lot of potential applications. We here present combined experimental and theoretical studies on the wrinkling of stiff thin films on SMPs. Experimental results show well-defined, wavy profiles of the thin films. Time and temperature dependent wrinkle formation and evolution were observed. Finite element simulations accounting for the thermomechanical behavior of SMPs were used to study wrinkling of thin films on SMPs, which show good agreement with experiments. This study can have important implications in surface engineering, stretchable electronics and advanced manufacturing.

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