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Adhesion Behavior of Non-planar Wrinkled Surfaces SANTANU KUNDU, University of Massachusetts-Amherst, RAVI SHARMA, Bausch and Lomb Inc, ALFRED CROSBY, University of Massachusetts-Amherst — Topological patterns on polymer surfaces can be used to significantly alter the surface properties, such as adhesion and contact angles. Conventional patterning methods, including photo- and imprint lithography, are difficult to apply to non planar surfaces. Surface wrinkling induced by swelling of a soft substrate constrained by a stiff, thin surface layer offers an attractive approach. Using this method, surface patterns of various length scales over a large area on curved geometries were obtained. Controlling the thickness of the stiff layer (silicate) on a soft foundation (polydimethylsiloxane elastomers) and the strain conditions, amplitude and wavelength of the wrinkles were varied. We quantified the effect of wrinkle morphology on the adhesion of non-planar substrates.

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