
Solid Marangoni stresses

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Abstract

Despite its importance in any adhesion and wetting phenomena, there is a fundamental property that is not yet understood in soft solids: surface elasticity. Also called the Shuttleworth effect, surface elasticity is intimately linked to the solid physico-chemistry and can be boiled down to one question. Does stretching the surface of a soft solid change its surface tension? In 2021, we demonstrated that the mechanical response of a textured silicone gel could only be explained by an elastic surface(1). It is, however, still unclear whether the measured surface elasticity is a true material property or a mere consequence of the surface preparation. This presentation will focus on a novel experimental setup that exploits Marangoni stresses and local TFM techniques to characterize the surface mechanics of pristine surfaces.

Références :

(1) Nicolas Bain, Anand Jagota, Katrina Smith-Mannschott, Stefanie Heyden, Robert W. Style, and Eric R. Dufresne, Phys. Rev. Lett. 127, 208001 – Published 8 November 2021.

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