

Abstract Submitted  
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**Elasticity of Flowing Soap films** ILDOO KIM, SHREYAS MANDRE,  
Brown University — The robustness of soap films and bubbles manifests their mechanical stability. The single most important factor underlying the mechanical stability of soap films is its elasticity. Non-destructive measurement of the elasticity in these films has been cumbersome, because of its flowing nature. Here we provide a convenient, reproducible, and non-destructive method for measuring the elasticity by generating and inspecting Marangoni waves. Our method is based on generating an oblique shock by inserting a thin cylindrical obstacle in the flowing film, and converting the measured shock angle to elasticity. Using this method, we find a constant value for the elasticity of 22 dyne/cm in the commonly used range of film widths, thicknesses or flow rates, implying that the surface of the film is chemically saturated with soap molecules.

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