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Distribution of soap molecules in flowing soap films ILDOO KIM, AAKASH SANE, SHREYAS MANDRE, Brown University — Flowing soap films are useful tools to simulate two-dimensional flows. The Marangoni elasticity due to the presence of soap molecules not only stabilizes the soap film but also imparts it compressibility to the two-dimensional flow in the soap film. Therefore, it is desirable to measure the surface concentration c_s of soap molecules to understand the physics flowing soap films. In this study, we present an indirect measurement of c_s , by making a direct measurement of the surface tension and the Marangoni elasticity. Using a two-stage model for soap distribution in the flows, the range of c_s is calculated for different thickness and the soap solution concentration. Our model shows that the soap film will have the same c_s for the range of parameters in popular use and in agreements with experimental data.

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