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stability of a uniaxial marangoni flow ARNAUD SAINT-JALMES, CORENTIN TREGOUET, CNRS-Institut de physique de Rennes — Marangoni flows result from surface-tension gradients, and while these flows may occur over finite distances on the surface, subsequent secondary flows can be observed on much larger lengthscales. These flows play major roles in various phenomena, from foam dynamics to microswimmer propulsion. We show here that if a Marangoni flow of soluble surfactants is confined laterally, the flow forms an inertial surface jet. A full picture of the flows on the surface is exhibited, and the velocity profile of the jet is predicted analytically, and is successfully compared with the experimental measurements. Moreover, this straight jet eventually destabilizes into meanders. Quantitative comparison between the theory and our experimental observations yields a very good agreement in terms of critical wavelengths. The characterization and understanding of the 2D flows generated by confined Marangoni spreading is a first step to understand the role of inertial effects in the Marangoni flows with and without confinement.

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