Abstract Submitted
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Polygonal instability of Marangoni flows MATTHIEU ROCHÉ, Laboratoire Matière et Systèmes Complexes, CNRS - Université Paris Diderot, MATTHIEU LABOUSSE, Laboratoire Matériaux et Phénomènes Quantiques, CNRS - Université Paris Diderot, BABA EL HADJ MAIGA, LOC NYA, Laboratoire Matière et Systèmes Complexes, CNRS - Université Paris Diderot, SÉBASTIEN LE ROUX, ISABELLE CANTAT, ARNAUD SAINT-JALMES, Institut de Physique de Rennes, CNRS - Université Rennes 1 — The transport of pepper grains floating at the surface of a bowl of water after the release of a drop of dishwashing liquid is a classical experiment to demonstrate the Marangoni effect, i.e. the flow of a liquid layer induced by interfacial tension gradients at its surface. In this case, the interfacial tension gradient results from a surfactant interfacial concentration gradient. Recently, we showed that continuous injection of an aqueous solution of hydrosoluble surfactants at the surface of a cm-thick pure water layer induced finite-size Marangoni flows surrounded by a region characterized by the presence of several pairs of interfacial vortices arranged along the the vertices of polygons.[1] During this talk, I will show that we can understand the flow structure induced by these Marangoni flows, in particular their tendency to have polygonal shapes. I will describe how flow features such as the number of interfacial vortices or bulk recirculation flows depend on flow geometry. Finally, I will compare these results to a model that explains similar polygonal instabilities in other flows such as the hydraulic jump.[2]

[1]M. Roché et al., **Phys. Rev. Lett.** 112, 208302 (2014)
[2]M. Labousse and J. W. M. Bush, submitted

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