Abstract Submitted
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Two-dimensional Faraday instability with a spatially periodic bottom[1] NICOLAS PERINET, CLAUDIO FALCON, DFI-FCFM-Universidad de Chile, SEUNGWON SHIN, Hongik University, JALEL CHERGUI, DAMIR JURIC, LIMSI-CNRS — We study two-dimensional Faraday waves in a channel with rectangular obstacles on the lower boundary, varying the height and the length of the obstacles as well as the distance separating them to understand their influence on the wave patterns. The analysis is mainly numerical and performed by means of BLUE, a code based on a hybrid Front-Tracking/Level-set algorithm for Lagrangian tracking of arbitrarily deformable phase interfaces. In the absence of obstacles, the bifurcation diagram shows three distinct instabilities: the classical instability that leads to the formation of patterns, the sudden onset of temporal chaos and finally a high jump in the amplitude of the waves, the latter bifurcation showing hysteresis. We show that the presence of obstacles delays the primary threshold, inhibits the secondary instabilities and enriches the dynamics of the interface. In particular, obstacles add a new spatial large-scale stationary mode and harmonics resulting from its interaction with the classical resonant modes.

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