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The subcritical transition to turbulence of standing Faraday waves BENOIT-JOSEPH GRA, MATHILDE CAVELIER, ANTOINE BRIARD, CEA de Bruyeres-le-Chatel, LOUIS GOSTIAUX, CNRS — We study the breaking process leading to turbulence of interfacial standing waves between miscible fluids of small density contrast. In our experiment, a primary wave is generated by a time-periodic acceleration via the Faraday instability (see [1]. As the standing wave amplitude grows, a secondary destabilization process occurs and produces turbulent mixing at the nodes. We explain this phenomenon as a subcritical parametric instability at small scales and propose a criterion derived from local or global stability analysis to predict when and for which amplitude it appears. This theory is then assessed with various numerical and experimental data varying the frequencies and amplitude of the forcing acceleration.

[1]Briard et al., *J. Fluid Mech.* **883** (2020)

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