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Non-axisymmetric collapse of cylindrical cavities IVO PETERS, OSCAR R. ENRIQUEZ PAZ Y PUENTE, STEPHAN GEKLE, LAURA E. SCHMIDT, DEVARAJ VAN DER MEER, DETLEF LOHSE, University of Twente, The Netherlands — Upon the impact of a circular disk on a water surface an expanding cylindrical cavity is created which collapses under the influence of the hydrostatic pressure. We experimentally observe small disturbances in the azimuthal direction that tend to grow towards the pinch-off. To quantitatively investigate the growth of specific mode-numbers, we use disks with a harmonic disturbance applied to their round shapes and study the collapse of the disturbed cavity using high-speed imaging. We performed experiments using disturbances up to mode number $m = 6$, with varying strength from 1% to 25% of the radius of the undisturbed circular disk. For the smallest disturbances we compare the experimental results to a linear stability analysis, following Schmidt *et al.*, Nat. Phys. 5, 343-346 (2009). Larger disturbances become non-linear in an early stage, showing a wealth of complex phenomena like secondary collapses and jets, during which the initial symmetry corresponding to the mode number m always remains preserved.

Devaraj van der Meer
University of Twente, The Netherlands

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