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WITHDRAWN: Rotating Polygons on a Fluid Surface TOMAS BOHR, The Technical University of Denmark, THOMAS JANSSON, MARTIN HASPANG, KAARE JENSEN, University of Copenhagen, PASCAL HERSEN, Harvard University — The free surface of a rotating fluid will, due to the centrifugal force, be pressed radially outward. If the fluid rotates as a rigid body in a cylindrical container the surface will assume a parabolic shape. If, however, the flow is driven by rotating the bottom plate, the axial symmetry can break spontaneously and the surface can take the shape of a rigidly rotating polygon. With water we have observed polygons with up to 6 corners. The rotation speed of the polygons does not coincide with that of the plate, but it is often mode-locked, such that the polygon rotates by one corner for each complete rotation of the plate. It has been known for many years that such flows are prone to symmetry breaking. The creation of rotating waves inside the container was observed for Reynolds numbers up to around 3000, where the free surface remains essentially flat (see J. M. Lopez and F. Marques and A. H. Hirsa and R. Miraghaie, "Symmetry breaking in free-surface cylinder flows," *J. Fluid Mech.*, **502**, 99 (2004)). The polygons occur at much larger Reynolds numbers, for water around 500.000. Correspondingly, the dependence on viscosity is rather small.

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