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Lack of Self-Similarity in the Collapse of a Giant Bubble RAYMOND BERGMANN, Faculty of Science and J. M. Burgers Centre for Fluid Dynamics, University of Twente, 7500 AE Enschede, The Netherlands, MARK STIJNMAN, MARIJN SANDTKE, DEVARAJ VAN DER MEER, ANDREA PROSPERETTI, DETLEF LOHSE — Self–similarity has been the paradigmatical picture for the pinch–off of a drop. Here we will show through high– speed imaging and Boundary Integral simulations that the inverse problem, the pinch-off of an air bubble in water, is not self- similar: A disk is quickly pulled through a surface leading to a giant, cylindrical cavity which after collapse creates an upward and a downward jet. The minimal void radius scales only in the limiting case of large Froude number like $R(t) \sim \mathrm{t}^{\frac{1}{2}}$, as expected for the purely inertial regime. The collapse slows down however for lower values of Froude due to a flow component in the vertical direction introducing a second time–dependent length–scale, the curvature of the void.

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