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Airflow driven pinch-off of a bubble in a rotating liquid RAYMOND BERGMANN, ANDERS ANDERSEN, TOMAS BOHR, Department of Physics and Center for Fluid Dynamics, The Technical University of Denmark, DK-2800 Kgs. Lyngby, Denmark , DEVARAJ VAN DER MEER, Faculty of Science and J. M. Burgers Centre for Fluid Dynamics, University of Twente, 7500 AE Enschede, The Netherlands — We create air bubbles at the tip of a "bathtub vortex" which reaches to a finite depth. The "bathtub vortex" is induced by letting water drain through a small hole at the bottom of a rotating cylindrical container. The tip of the needle-like surface depression is unstable at high rotation rates and releases bubbles which are carried down and out through the drain-hole. Using high-speed imaging we find that the minimal neck radius of the unstable tip decreases as $R(t) \sim t^{\frac{1}{3}}$. This power law exponent signals that the air flow in the neck becomes the dominant effect over the stabilizing centrifugal forces and causes the eventual pinch-off.

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