Self-similar draining near a vertical edge[1] NAN XUE, HOWARD
STONE, Princeton University — When a liquid film drains on a vertical plate, the
film becomes nonuniform near the vertical edge. Here we experimentally report the
three-dimensional (3D) self-similar shape of this film. Based on the well-known 2D
self-similar solution of a draining film far from the edge, we identify a new 3D self-
similar scaling, which converts the PDE for the film thickness with three independent
variables into an ODE. Interferometry is performed to measure the film thickness as
a function of position and time, and the results are in excellent agreement with the
theoretical predictions.

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