

Abstract Submitted
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Self-similarity of an eroding body M. NICK J. MOORE, LEIF RISTROPH, STEPHEN CHILDRESS, MICHAEL SHELLEY, Courant Institute, JUN ZHANG, New York University Department of Physics, Courant Institute, APPLIED MATH LAB TEAM — Motivated by the erosion of natural landforms, we study the interaction between an eroding body and surrounding fluid-flow using experiments and simulations. Both reveal the emergence of a unique shape that forms early and then shrinks in a self-similar fashion. Here, I focus on simulations in which erosion rate is dictated by local shear stress. In this high-Reynolds-number context, we determine shear stress by combining an outer, inviscid flow with a boundary layer flow. We discover that a broad range of initial shapes morph into a terminal shape characterized by nearly uniform shear.

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