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Super-Extremal Spinning Black Holes via Accretion PABLO LAGUNA, TANJA BODE, Georgia Tech, RICHARD MATZNER, University of Texas at Austin — A Kerr black hole with mass M and angular momentum J satisfies the extremality inequality $J \leq M^2$. In the presence of matter and/or gravitational radiation, the bound needs to be reformulated in terms of local measurements of M and J directly associated with the black hole. The isolated and dynamical horizons framework provides such natural quasi-local characterization of M and J, making possible in axi-symmetry to reformulate the extremality limit as $J \leq 2\,M^2$, with M the irreducible mass computed from the apparent horizon area and J obtained using approximate rotational Killing vectors on the apparent horizon. This condition is also equivalent to requiring a non-negative black hole surface gravity. We present numerical experiments of an accreting black hole that temporarily violates this extremality inequality.

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