Abstract Submitted
for the APR16 Meeting of
The American Physical Society

Modeling Dynamical Black Holes with Spin Parameters Larger Than 0.999 IAN RUCHLIN, ZACHARIAH ETIENNE, West Virginia University — Exploring the extremal Kerr limit in a dynamical, fully general relativistic context may lend insights into the no-hair theorem and uncover new mechanisms by which black hole spins can be increased beyond astrophysical or Kerr limits. Modeling such black holes is highly challenging, with state-of-the-art numerical relativity simulations reaching spin parameters of 0.99 to 0.995 only recently. We have developed new techniques that open the door to stable and reliable puncture black hole evolutions with spin parameters in excess of 0.999. We briefly review these techniques, the results, and possible applications.

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Date submitted: 08 Jan 2016 Electronic form version 1.4