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Toward the evolution of magnetized differentially rotating neutron stars with AMR MATTHEW ANDERSON, Louisiana State University, ERIC HIRSCHMANN, Brigham Young University, STEVEN LIEBLING, Long Island University, DAVID NEILSEN, Brigham Young University — The interaction of rotating compact objects endowed with magnetic fields likely plays a key role in understanding and modelling the central engines of active galactic nuclei, gamma ray bursts, and jet formation. Such simulations not only require dynamic gravitational backgrounds and relativistic fluid treatments, but also adequately resolving many time and length scales in order to capture the dynamics. Using a distributed adaptive mesh refinement infrastructure, we explore simulations of differentially rotating neutron stars both with and without magnetic fields in full 3-D.

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