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Relativistic MHD with Wavelet Adaptive Multi-Resolution in Dendro-GR DAVID NEILSEN, JACOB FIELDS, ERIC HIRSCHMANN, Brigham Young Univ - Provo, MILINDA FERNANDO, HARI SUNDAR, University of Utah — Relativistic MHD is often used to model astrophysical systems with magnetic fields, such as binary neutron star mergers and accretion disks. One challenge in solving these equations numerically is the wide range of length scales that must be adequately resolved, especially to capture the small-scale dynamics that affect the large-scale magnetic field. Dendro-GR is a new computational platform for relativistic astrophysics that uses a highly efficient parallel octree with Wavelet Adaptive Multi-Resolution (WAMR) to enable large, multi-scale simulations. This code is being used to study binary black hole mergers. We are adding relativistic MHD to Dendro-GR with the ultimate aim of evolving binary neutron stars. We report on the progress of this project and present some initial results from tests with simpler systems, such as magnetized flows in flat spacetime and GRB outflows.

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