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Neutron star evolutions using the discontinuous Galerkin method
FRANCOIS HEBERT, Cornell University, SXS COLLABORATION COLLABORATION — Relativistic hydrodynamic simulations enable us, for instance, to generate templates used for gravitational-wave detections of black hole-neutron star mergers, or to understand supernova explosion mechanisms. But the limited accuracy of the simulation algorithms used, often based on the finite volume method, constrains the insight we can obtain into these problems. We aim to improve the accuracy of our simulations by using a discontinuous Galerkin method. This method's attractiveness arises from its combination of spectral convergence properties for smooth solutions with robust stability properties for shocks. We present our work implementing a testbed discontinuous Galerkin GR-hydro code, and show our results for test evolutions of an isolated neutron star.

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