Abstract Submitted
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Evolving neutron stars with the Nmesh code[1] WOLFGANG TICHY, ANANYA ADHIKARI, LIWEI JI, Florida Atlantic University — We present an overview of the new Nmesh code, which is intended to efficiently run on large supercomputers to solve challenging relativistic astrophysics problems such as binary neutron star or black hole mergers. The principal spatial discretization used in Nmesh is based on a discontinuous Galerkin (DG) method. We have implemented the evolution equations for general relativistic hydrodynamics, as well as the evolution equations for gravity using the generalized harmonic formulation. We present first results from tests with neutron stars. In these tests we evolve stationary and boosted stars both in Cowling approximation and in full General Relativity. We discuss which methods we use to achieve stable evolutions. We also present a hybrid scheme where we use a finite volume method in part of the numerical domain, e.g. around the star surface.

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Wolfgang Tichy
Florida Atlantic University

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