Abstract Submitted
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Massively Parallel Simulations of Binary Black Hole Intermediate-Mass-Ratio Inspirals[1] DAVID NEILSEN, Brigham Young Univ - Provo, MILINDA FERNANDO, HARI SUNDAR, University of Utah, ERIC HIRSCHMANN, HYUN LIM, Brigham Young Univ - Provo — Intermediate Mass Ratio Inspirals (IMRIs) are binary black hole systems with mass ratios between $q = 1/10^2$ and $q = 1/10^4$. These binaries may be formed in globular clusters, and their gravitational waves will be important sources for LISA, as well as aLIGO and third-generation detectors. IMRI binaries are very difficult to simulate in numerical relativity, where mass ratios are typically larger than $q = 1/10$, because the disparate length scales of the black holes requires significant computational resources. We are developing a new relativistic code to solve the Einstein equations for black hole systems with $q < 1/10$. This code is based on the Dendro platform for parallel octrees, which scales to 10^5 cores. The computational grid is dynamically generated using the Adaptive Multiresolution Wavelet Method. This resulting computational grid is sparse and adapted to the geometry of the spacetime, leading to high computational efficiency. We will discuss the computational performance of our code and present preliminary results of binary mergers.

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