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A Parallel Wavelet Approach for Binary Compact Object Mergers HYUN LIM, ERIC HIRSCHMANN, DAVID NEILSEN, WILLIAM BLACK, Brigham Young Univ - Provo, MATTHEW ANDERSON, Indiana University, HARI SUNDAR, MILINDA FERNANDO, University of Utah — Highly accurate simulations of binary black holes and neutron stars are needed to address a variety of interesting problems in relativistic astrophysics. We report on an ongoing development effort to solve the Einstein equations using iterated interpolating wavelets. Wavelet coefficients provide a direct measure of the local approximation error for a solution and place collocation points that naturally adapt to features of the solution. Further, they exhibit good convergence properties on unevenly spaced collocation points. These are readily incorporated into a parallel implementation using DENDRO, a highly scalable parallel algorithm for multigrid and AMR methods on 2:1 balanced octrees.

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