Abstract Submitted
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Gravitational Memory in Numerical Relativity: Computing Memory Effects and Correcting Existing Waveforms[1] KEEFE MITMAN, California Institute of Technology, DANTE A. B. IOZZO, Cornell University, NEEV KHERA, The Pennsylvania State University, MICHAEL BOYLE, Cornell University, TOMMASO DE LORENZO, The Pennsylvania State University, NILS DEPPE, California Institute of Technology, LAWRENCE E. KIDDER, Cornell University, JORDAN MOXON, California Institute of Technology, HARALD PFEIFFER, Max Planck Institute for Gravitational Physics, MARK SCHEEL, California Institute of Technology, SAUL TEUKOLSKY, California Institute of Technology and Cornell University, WILLIAM THROWE, Cornell University — Gravitational memory is a phenomenon induced by the passage of gravitational waves that corresponds to persistent, physical changes to spacetime. We present advances in resolving the two primary gravitational memory effects—displacement and spin memory—in numerical simulations of binary black hole mergers produced by SXS's Spectral Einstein Code. We show that the waveforms extracted using Cauchy-characteristic extraction (CCE) obey the Bondi-Metzner-Sachs (BMS) balance laws to a high degree of accuracy, unlike previous waveforms produced by numerical relativity simulations. We also show that the waveforms in all publicly available waveform catalogs, which do not exhibit memory effects, can be corrected to include such features.

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