Abstract Submitted
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Reducing junk radiation and eccentricity in binary-black-hole initial data[1] GEOFFREY LOVELACE, HARALD PFEIFFER, DUNCAN BROWN, LEE LINDBLOM, MARK SCHEEL, California Institute of Technology, LAWRENCE KIDDER, Cornell University — Numerical simulations of binary-black-hole (BBH) collisions require initial data that satisfy the Einstein constraint equations. Several well-known methods generate constraint-satisfying BBH data, but the commonly-used simplifying assumptions lead to undesirable effects. BBH data typically assume a conformally flat spatial metric; this leads to an initial pulse of unphysical "junk" gravitational radiation. Also, the initial radial velocity of the holes is often neglected; this can lead to significant eccentricity in the holes' trajectories. This talk will discuss efforts to reduce these effects by constructing and evolving generalizations of the BBH initial data of Cook and Pfeiffer (2004). By giving the holes a small radial velocity, the eccentricity can be greatly reduced (although the emitted waves are largely unaffected). The junk radiation for flat and non-flat conformal metrics will also be compared.

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