

Abstract Submitted
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Spin-Spin Effects in Models of Binary Black Hole Systems SCOTT HAWLEY, Belmont University, RICHARD MATZNER, University of Texas at Austin, LINDSEY THOMPSON, Goldsmiths, University of London — We have implemented a parallel multigrid solver, to solve the initial data problem for 3 + 1 General Relativity. This involves solution of elliptic equations derived from the Hamiltonian and the momentum constraints. We use the conformal transverse-traceless method of York and collaborators which consists of a conformal decomposition with a scalar that adjusts the metric, and a vector potential that adjusts the longitudinal components of the extrinsic curvature. The constraint equations are then solved for these quantities such that the complete solution fully satisfies the constraints. We apply this technique to compare with theoretical expectations for the spin-orientation- and separation-dependence in the case of spinning interacting (but not orbiting) black holes. We write out a formula for the effect of the spin-spin interaction which includes a result of Wald as well as additional effect due to the rotation of the mass quadrupole moment of a spinning black hole.

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