

Abstract Submitted
for the APR09 Meeting of
The American Physical Society

Null Geodesics as a Tool to Analyze Properties of Spacetimes in Numerical Relativity RANDY WOLFMEYER, University of Wisconsin-Milwaukee, JIAN TAO, Louisiana State University-Baton Rouge, HUI-MIN ZHANG, WAI-MO SUEN, Washington University in St Louis — We analyze the properties of a spacetime in terms of measurable physical quantities through the construction of null geodesics. The technique enables the comparison of spacetimes independent of the choices of time slicings and spatial coordinates used in the numerical construction. We apply the technique to study the accuracy of the quasi-equilibrium approximation of neutron star binaries. The phase of the inspiraling binary as observed at infinity and the distance between the two stars are constructed with null geodesics. We determine the minimum separation required for the quasi-equilibrium conformally flat assumptions to yield astrophysically realistic initial data for irrotational binary neutron star systems.

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Date submitted: 09 Jan 2009

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