Curvature-Based Method for Measuring Numerical Black-Hole Spins BERNARD KELLY, CRESST/UMBC/NASA GSFC, TEHANI FINCH, ORAU/NASA GSFC, JAMES VAN METER, University of Colorado Boulder, JOHN BAKER, NASA GSFC — Accurate determination of spin magnitude and direction over time is crucial for the development of gravitational-wave templates that faithfully reflect the dynamics of generic comparable-mass black-hole binary mergers. We report on the development of a new method for measuring black-hole spins during numerical-relativity simulations of black-hole binary mergers. This method is based on the "spin scalar," a complex scalar field derived from the Coulomb scalar of Beetle & Burko (2002). Our new method can be used to derive both spin magnitude and direction, and can be combined with other techniques, such as isolated-horizon methods. We present convergence studies, and demonstrations of behavior during precessing mergers of spinning black holes.

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