Abstract Submitted
for the APR18 Meeting of
The American Physical Society

Highly-Spinning Data for Puncture-Based Codes[1] YOSEF ZLOCHOWER, CARLOS LOUSTO, JAMES HEALY, Rochester Inst of Tech, IAN RUCHLIN, West Virginia University — We describe the challenges and successes associated with our recent extension of HiSpID data to generate initial data for highly spinning binaries with unequal masses and misaligned spins. In the standard puncture approach to initial data, the linear momentum and spins of the two black holes are specified precisely, while the masses are implicitly specified using bare mass parameters (which can differ significantly from the actual measured black hole masses). In our approach, the black hole masses match the mass parameters to a high degree of precision, as do the spins and spin parameters, however, the linear momentum of each hole is an implicit function of boost-like parameters. To get the desired orbital angular momentum, we use an iterative procedure to fix the ADM linear and angular momentum of the spacetime to the desired values. We find that our approach yields binaries with both high spins and low eccentricity.

[1]The authors gratefully acknowledge the National Science Foundation (NSF) for financial support from Grants No. PHY-1607520, No. PHY-1707946, No. ACI-1550436, No. AST-1516150, No. ACI-1516125, No. PHY-1726215.

Yosef Zlochower
Rochester Inst of Tech

Date submitted: 02 Jan 2018 Electronic form version 1.4