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Computing Binary Black Hole Initial Data in Damped Harmonic Gauge VIJAY VARMA, MARK SCHEEL, Caltech, SXS COLLABORATION — Binary black hole evolution in the Spectral Einstein Code (SpEC) is currently done in the damped harmonic (DH) gauge, which has proven very useful for merger simulations. However, the initial data for the simulation is constructed in a different gauge. Once the evolution starts we need to perform a smooth gauge transformation to the DH gauge, introducing additional gauge dynamics into the evolution. In this work, we construct the initial data in the DH gauge itself, which allows us to avoid the above gauge transformation. This can have added benefits such as possibly reducing junk radiation, making it easier to achieve a desired orbital eccentricity, reducing the runtime of simulations, and being able to start evolution closer to the merger.

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