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Testing improved length and accuracy of numerical simulations of merging black holes NICK DEMOS, California State University Fullerton, SXS COLLABORATION — Gravitational waves are ripples in space and time that Einstein predicted in 1916. Merging black holes are among the most promising sources of gravitational waves, and highly accurate numerical simulations of these sources are crucial for helping experiments detect as many gravitational waves as possible. Using the newest version of the Spectral Einstein Code (SpEC), I simulated equal mass, non-spinning, merging black holes, a well-studied benchmark case, and I compared the numerical waves' accuracy against a previous simulation. The new simulation is significantly longer, and it includes recent changes in SpEC designed to improve the simulated waves' accuracy, such as better resolving the unavoidable initial high frequency burst of spurious gravitational waves. This and future long, high-accuracy simulations will help develop improved approximate, analytic models of the waves for gravitational-wave searches.

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