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CAFE: A relativistic Magnetohydrodynamics code

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We present CAFE, a code designed to solve the equations of relativistic ideal magnetohydrodynamics (RMHD) in three cartesian dimensions. We present the standard tests for the relativistic RMHD regime. The tests include among the two-dimensional (2D) and 3D tests with magnetic field. The code uses high-resolution shock-capturing methods, and we present the error analysis for a combination that uses the Harten, Lax, van Leer, and Einfeldt flux formula combined with a linear, PPM and WENO5 reconstructors. We use the flux-constrained transport and the divergence cleaning methods to control the divergence-free magnetic field constraint.

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