A new open-source spherically-symmetric general-relativistic hydrodynamics code for the study of stellar collapse and black hole formation EVAN O'CONNOR, CHRISTIAN OTT, California Institute of Technology — We present a new open-source general-relativistic (GR) code based on the formulation of Romero-Ibanez and employing radial-gauge, polar-slicing coordinates in which the 3+1 equations simplify substantially. We discretize the GRHD equations with a finite-volume scheme, employing piecewise-parabolic reconstruction of state variables at cell interfaces and approximate Riemann solvers. The GRHD part of the code is coupled to various finite-temperature microphysical equations of state and an approximate deleptonization scheme for the collapse phase and a neutrino-leakage/heating scheme for the postbounce epoch are included and described. An array of test calculations is presented.

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