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Fallback Accretion in Core-Collapse Supernova Explosions[1] HANNALORE J. GERLING-DUNSMORE, CHRISTIAN D. OTT, TAPIR, California Institute of Technology — Core-collapse supernovae (CCSNe) are expected to result in one of two kinds remnants: neutron stars (NSs) and black holes (BHs). It is believed that if a CCSN explosion fails, a BH results, and if the explosion is successful, a NS results. This certainly is the case if there is a strong explosion that unbinds the entire stellar mantle. However, in the case of a weak or severely asymmetric explosion, a substantial quantity of material may fall back. This is commonly called fallback accretion, and it is a potential means of BH formation. We study fallback accretion in spherically-symmetric (1D) neutrino-driven CCSNe using the open-source GR1D code. We obtain explosions by artificially enchancing neutrino energy deposition and in this way also control the explosion energy. We present results on the mapping from progenitor structure and explosion energy to amount and rate of fallback accretion.

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