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Effects of the nuclear equation of state on the outcome of core-collapse supernovae SOMDUTTA GHOSH, SANJANA CURTIS, CARLA FROHLICH, Department of Physics, North Carolina State University, Raleigh, NC 27695, USA — Massive stars end their lives when their core collapses under gravity, resulting in either a core-collapse supernova (successful explosion) or a black hole (failed explosion). Despite many efforts, it is not yet fully understood which massive stars will successfully explode in a core-collapse supernova and which ones will collapse to a black hole. Here, we investigate the impact of the nuclear equation of state (eos) on the outcome of core collapse (successful or failed explosion) and the subsequent nucleosynthesis. We model the explosion in spherical symmetry using the effective push method together with general-relativistic hydrodynamics and neutrino transport. We use several supernova eos(s) and study the variation in explosion properties and nucleosynthesis yields for stars with different zams mass. We find that the eos significantly impacts the outcome of our simulations.

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