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Nucleon-nucleon bremsstrahlung in core-collapse supernova simultations

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Neutrinos are the main vector of energy transport in the revival process of a stalled supernova shock. The treatment of their interactions with the medium is therefore an important part of our simulations. One of those interactions is the nucleon-nucleon bremsstrahlung which will create or annihilate a neutrino/anti-neutrino pair. In this talk, I will present the results for a finer treatment of this process in the GR1D supernova evolution code. I will talk about simulations from two different progenitors, one of which producing a successful explosion. Those simulations showed that the way of treating nucleon-nucleon bremsstrahlung and electron-positron pair production can have a significant impact on the shock evolution as well as on the neutrino luminosities.

Keywords

Core-Collapse Supernovae

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