

Core-collapse Supernova Simulation with Subgrid Modeling of Fast Neutrino Flavor Conversion with Boltzmann Radiation Hydrodynamics Code

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Collective neutrino oscillation induced by neutrino self-interaction has been brought great attention in theoretical CCSN modeling.

Especially fast flavor conversion (FFC), which is caused by angular crossings in momentum space, is expected to affect CCSN dynamics.

However, including FFC effects into CCSN simulation is challenging because (1) FFC depends on momentum space angle distribution, and (2) the length scale of FFC is orders of magnitude shorter than that of classical simulations.

In this talk, I present results of CCSN simulations based on Boltzmann radiation hydrodynamics code with Bhatnagar-Gross-Krook (BGK) subgrid modeling of FFC.

I compare several mixing methods and numerical strategies and discuss effects onto CCSN dynamics and neutrino signals.

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