

# Fully relativistic CCSN simulations of 20Msun star with magnetic field

*Tuesday, 13 August 2019 11:00 (20 minutes)*

We will report fully relativistic CCSN simulations of 20Msun progenitor star with M1 neutrino transport. To explore the role of magnetic field, particularly in the explosion dynamics and in the explosive nucleosynthesis, we calculated several models w/ and w/o rotation and magnetic field. Regarding the dynamics, we found a bipolar outflow in strongly magnetized model, while oblate like explosion is seen in non-magnetized rotating model. The ejecta in the magnetorotational explosion (MRE) model show relatively higher entropy and Ye compared to the previous studies with rather more simplified neutrino treatments. Because of the 3D effects, the MRE is not a collimated jet-like explosion and the abundance pattern reaches only up to the second peak. This is consistent with previous study. In this talk, we will also discuss their multi-messenger aspects including neutrino and GW signals.

## Keywords

Core-Collapse Supernovae

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