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P4.087 Supernova neutrino detection in NO ν A experiment

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Supernova explosions produce large number of neutrinos with energies around 10-60 MeV. This neutrino signal is peaked at several milliseconds after the core bounce and then has a decaying tail for several tens of seconds. Studying these neutrinos can provide information about the processes affecting the supernova explosion and probe existing models.

This poster describes a developed data-driven trigger designed to detect neutrino signal from a galactic supernova using the NO ν A detectors.

Since the NO ν A experiment is designed to measure neutrino oscillations in a ν_{μ} beam with average energy of 2 GeV, detecting interacting low-energy neutrinos from supernova requires dedicated data selection and background reduction. To detect the supernova event we monitor the number of selected interactions per 5ms block. Since the background is stable in time, we aim to detect the supernova neutrino time structure above the background.