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Diffuse Supernova Neutrino Background Detection at JUNO

As an underground multi-purpose neutrino detector with 20 kton liquid scintillator, JUNO has great potential to detect the supernova neutrino background (DSNB). Depending on intensive supernova neutrino simulation from the numerical supernova simulations, about 4-8 events per year are expected to be detected. The dominant background is from the neutral-current (NC) interaction of atmospheric neutrino with ^{12}C, which surpasses the DSNB by more than one order of magnitude. The precise prediction based on six data-driven nuclear models gives an uncertainty of 20%, but the in-situ measurement based on the decay information of the residual nuclei could reduce the uncertainty to 10%. The backgrounds can be effectively suppressed by pulse shape discrimination. The poster presents a sophisticated DSNB sensitivity study at JUNO.

Mini-abstract

JUNO, DSNB, NC interaction of atmospheric neutrino in LS and pulse shape discrimination

Experiment/Collaboration

JUNO

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