

Potential of Core-Collapse Supernova Neutrino Detection at JUNO

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JUNO is an underground neutrino observatory under construction in Jiangmen, China. It uses 20kton liquid scintillator as target, which enables it to detect supernova burst neutrinos of a large statistics for the next galactic core-collapse supernova (CCSN) and also pre-supernova neutrinos from the nearby CCSN progenitors. All flavors of supernova burst neutrinos can be detected by JUNO via several interaction channels, including inverse beta decay, elastic scattering on electron and proton, interactions on C12 nuclei, etc. This retains the possibility for JUNO to reconstruct the energy spectra of supernova burst neutrinos of all flavors. The real time monitoring systems based on FPGA and DAQ are under development in JUNO, which allow prompt alert and trigger-less data acquisition of CCSN events. The alert performances of both monitoring systems have been thoroughly studied using simulations. Moreover, once a CCSN is tagged, the system can give fast characterizations, such as directionality and light curve. This talk will give an overview of physics potential of CCSN neutrino detection in JUNO.

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Subcategory

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