

Prospects and Challenges of Detecting the Diffuse Supernova Neutrino Background in JUNO

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Jiangmen Underground Neutrino Observatory (JUNO) is an underground multi-purpose neutrino experiment, using a 20 kton liquid scintillator detector. JUNO has the capability to detect diffuse supernova neutrino background (DSNB) through the inverse-beta-decay (IBD) detection channel on free protons. We employ the latest information on the DSNB flux predictions and investigate in detail the background and its reduction techniques for the DSNB search at JUNO. The primary background is caused by the neutral-current (NC) interaction of atmospheric neutrinos with ^{12}C nuclei, whose uncertainty is carefully evaluated from both the spread of model predictions and an envisaged *in situ* measurement. In addition, the background suppression techniques with the pulse shape discrimination (PSD) and triple coincidence (TC) cuts are carefully studied. With 3 years of data taking, JUNO can reach a 3σ significance for a reference DSNB model and better than 5σ after 10 years. Even in the pessimistic scenario of non-observation, JUNO would strongly improve the limits and exclude a significant region of the model parameter space. This talk will present the prospects of detecting the DSNB in JUNO.

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