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Real-time Monitoring of Transient Phenomena with JUNO

A new era of multi-messenger astronomy has arrived with the detection of gravitational waves and high-energy astrophysical neutrinos. The successful coordination of near real-time follow-up campaigns by multi-wavelength and multi-messenger instruments of those events have largely extended our understanding of the most violent phenomena in the Universe. With its unprecedented sensitivity to MeV scale neutrinos, the Jiangmen Underground Neutrino Observatory (JUNO) will contribute significantly to this exciting new field. We will present a model-independent real-time monitoring algorithm and the corresponding sensitivities to transient phenomena such as core-collapse supernova burst and pre-burst neutrino signals. Preliminary study shows that by implementing such algorithm on the firmware of a multi-messenger trigger system in JUNO can lead to significant detection of a typical core collapse supernova out to a distance of 100 kpc.

Mini-abstract

Real time monitoring of supernova neutrinos with JUNO

Experiment/Collaboration

JUNO

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