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JUNO supernovae neutrino potential

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Determination of neutrino mass hierarchy is the main purpose of Jiangmen Underground Neutrino Observatory (JUNO). JUNO is designed to determine neutrino mass hierarchy by a detailed examination of the spectrum of electron antineutrinos from nuclear reactors. The analysis of neutrino energy spectra emitted by a supernova represents another possible way to determine neutrino mass hierarchy because neutrino flavor conversions occurring inside the supernova are sensitive to neutrino mass hierarchy. The aim of this study is to explore the possibility of JUNO to distinguish between neutrino flavors coming in a supernova burst and measure their energy spectra. A set of observables and criteria is proposed that enable on the basis of measured neutrino energy spectra to distinguish between normal and inverted neutrino mass hierarchy and to prove or disprove some supernova theoretical models.

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