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Calibration of the JUNO detector using natural radioactivity

Friday, 21 June 2024 17:30 (2 hours)

The Jiangmen Underground Neutrino Observatory (JUNO) will be a 20-kiloton liquid scintillator detector, currently under construction in southern China. Equipped with 17,612 20-inch photomultiplier tubes (PMTs) and 25,600 3-inch PMTs, JUNO aims to use its world-leading size, energy resolution and low background levels to achieve its primary physics goal of resolving the fine structure due to oscillations in the nuclear reactor antineutrino energy spectrum, in order to determine the neutrino mass ordering and measure several oscillation parameters to a sub-percent precision. As JUNO enters its commissioning and early data-taking periods, having steady, robust calibration methods that evolve with time will be of particular use. Here, the measurement of key liquid scintillator parameters is presented using Bi-Po coincidence decays, which naturally occur in MeV-scale liquid scintillator detectors.

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