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Strategy for Measuring the Radioactive Contamination of Liquid Scintillator with the Pre-detector of JUNO: OSIRIS

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

The Jiangmen Underground Neutrino Observatory (JUNO) is a critically important neutrino experiments aimed at determining the mass hierarchy (MH) of neutrinos. It is currently under construction and will be filled with 20k tons of liquid scintillator (LS) to mainly observe the reactor anti-neutrinos from two sets of nuclear reactors located 53 km away. In order to reach the goal of 3σ sensitivity of MH measurement within 6 years of operation, the background control of the material used in the detector is stringent, which requires an extremely high purity of LS. The primary contributors to background in JUNO's LS are radioactive isotopes, mostly from the decay chain of ^{238}U/^{232}Th. The Online Scintillator Internal Radioactivity Investigation System (OSIRIS) is a pre-detector of JUNO dedicated to monitor the radioactivity contamination of LS prior to its introduction into the JUNO central detector. The OSIRIS detector is now filled with 18 tons of LS and 550 tons of pure water inside the cylindrical tank, which are monitored by 76 20-inch photomultiplier tubes. This poster will report the measurement on radioactivity purity of LS observed by OSIRIS, including the detection strategy and preliminary results based on the current dataset.

Poster prize

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