Contribution ID: **162** Type: **Oral report**

OSIRIS –An online scintillator radiopurity monitoring pre-detector of JUNO

Friday, 24 September 2021 16:10 (25 minutes)

JUNO is a 20 kt liquid scintillator detector under construction in Jiangmen, China, whose primary goal is to determine the neutrino mass hierarchy. Its construction is expected to be finished in 2022. To meet the stringent requirements on the radiopurity of the liquid scintillator, 10^{-16} g/g of ^{238}U and ^{232}Th, the OSIRIS (Online Scintillator Internal Radioactivity Investigation System) pre-detector has been designed to monitor the liquid scintillator during the several months of filling the large volume of JUNO. The OSIRIS design has been optimized for sensitivity for the ^{238}U/^{232}Th decay rates via the tagging of the respective ^{214}Bi -^{214}Po and ^{212}Bi-^{212}Po coincidence decays in the ^{238}U/^{232}Th decay chains. OSIRIS will be equipped with 76 20-inch PMTs. There are 64 of them observing the inner detector, which contains the 18-tons liquid scintillator target, surrounded by water. The remaining 12 PMTs are installed in the water Cherenkov veto detector, which surrounds the inner detector that is optically separated. This poster will show the design of several subsystems as well as the sensitivity of OSIRIS to the ^{238}U/^{232}Th, ^{14}C and ^{210}Po contaminations of the liquid scintillator.

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Session Classification: Section 3. Modern nuclear physics methods and technologies

Track Classification: Section 3. Modern nuclear physics methods and technologies.