Contribution ID: **268**   Type: **Poster**

Neutron source-based event reconstruction in the JUNO detector

Wednesday 30 August 2023 16:14 (1 minute)

The Jiangmen Underground Neutrino Observatory (JUNO) is the largest underground liquid scintillator experiment in the world, currently under construction in southern China. In its central detector, a 20-kton liquid scintillator in an acrylic vessel works as a neutrino target and is viewed by more than 17,000 20-inch photomultiplier tubes and more than 25,000 3-inch photomultiplier tubes. The primary experimental goal of JUNO is to determine the neutrino mass ordering by measuring the energy spectrum of reactor neutrinos. Vertex reconstruction and particle identification algorithms have been developed to suppress background contaminations in the reactor neutrino analysis sample as well as to understand the non-uniform energy response of the detector. Such algorithms can be developed with the radioactive neutron (Americium-Carbon) source which is planned to be regularly deployed to calibrate the JUNO detector responses. This poster will present the detailed methodology and reconstruction performances, especially on the vertex reconstruction and separation power between positron signals and alpha/fast-neutron backgrounds, using the JUNO detector simulation.

Submitted on behalf of a Collaboration?

Yes

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Session Classification: Poster session

Track Classification: Neutrino physics and astrophysics