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Event Reconstruction in JUNO

Friday, 26 February 2021 12:15 (5 minutes)

The Jiangmen Underground Neutrino Observatory (JUNO) is a 20 kton liquid scintillator experiment currently under construction in the vicinity of the Pearl River Delta in Southern China. Its main focus lies on the determination of the Neutrino Mass Ordering via measuring the oscillated spectrum of electron anti-neutrinos from two nuclear power plants in 53 km distance each. JUNO requires to measure the prompt positron signal of the coincident inverse beta decay reaction used for the anti-neutrino detection with an unprecedented energy resolution of 3% at 1 MeV. To be able to achieve this challenging energy resolution, the scintillation volume is densely instrumented with 17,612 large 20"-PMT's and 25,600 small 3"-PMT's. In case of a particle interaction in the detector, the digitized electronic pulses from the readout electronics of the large PMT's will be recorded. From the reconstruction of these pulses, it is possible to obtain the number and detection times of PMT photon hits, which are then used to reconstruct the particle energy, the time and vertex of the light emission, and the particle type. This presentation will show the development status of the reconstruction algorithms in JUNO with the focus on low energy events from the reactor spectrum. These will include conventional approaches, as well as novel approaches using deep learning methods.

Collaboration name

JUNO

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