

Machine Learning based photon counting for PMT waveforms and its application to the energy reconstruction in JUNO

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Jiangmen Underground Neutrino Observatory (JUNO), located in the southern part of China, will be the world's largest liquid scintillator (LS) detector upon completion. Equipped with 20 kton LS, 17612 20-inch PMTs and 25600 3-inch PMTs in the central detector (CD), the primary goal of JUNO is to determine the neutrino mass ordering, by precisely measuring the oscillation energy spectrum of anti-neutrinos from reactors. One of main challenges of JUNO is the unprecedented energy resolution requirement. The charge smearing of single photoelectron for PMTs is one of the dominant contributing factors to the energy resolution in JUNO. This poster will present a machine-learning-based method to reconstruct the number of photoelectrons for PMT waveforms and describe how it can be applied to JUNO to partially mitigate the impact of PMT charge smearing and improve the energy resolution.

Poster prize

No

Given name

Wuming

Surname

Luo

First affiliation

Institute of High Energy Physics, Chinese Academy of Sciences

Second affiliation

Institutional email

luowm@ihep.ac.cn

Gender

Male

Collaboration (if any)

JUNO

Primary author: LUO, Wuming (IHEP, CAS)

Co-authors: HUANG, Guihong (Wuyi University); JIANG, Wei (IHEP)

Presenter: LUO, Wuming (IHEP, CAS)

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