

Energy and timing resolution boost with waveform analysis

Friday 19 July 2024 20:40 (20 minutes)

To reconstruct the energy and time of events in the liquid scintillator detector, in a neutrino or dark matter experiment, we need to analyze the waveforms from photomultiplier tubes (PMTs). Fast Stochastic Matching Pursuit (FSMP) is a reversible jump Markov chain Monte-Carlo, which samples the posterior of PE time sequence for each waveform. Besides waveforms from dynode PMTs, FSMP is suitable to analyze waveforms from ALD-coated microchannel plate PMTs with long tail charge spectrum. This method gains acceleration on GPU, and improves the energy and time resolution of LS detectors. The energy resolution is improved by decreasing 12% of relative resolution.

Alternate track

1. Neutrino Physics

I read the instructions above

Yes

Primary author: WANG, Yuyi

Co-authors: Prof. XU, Benda (Tsinghua University at Beijing); WU, Yiyang (Tsinghua University)

Presenter: WANG, Yuyi

Session Classification: Poster Session 2

Track Classification: 13. Detectors for Future Facilities, R&D, Novel Techniques