

Low-Threshold Analysis for Low-Mass WIMP Search with COSINE-100

Wednesday 27 August 2025 18:00 (2 hours)

The COSINE-100 experiment is a direct dark matter search using 106 kg of NaI(Tl) crystal detectors, each with a light yield of approximately 15 photoelectrons per keV. The experiment was operated at the Yangyang Underground Laboratory in Korea, collecting 6.5 years of data. A nominal analysis has achieved a clean energy threshold of 8 photoelectrons by rejecting PMT-induced noise events. To further enhance sensitivity to low-mass WIMPs, we aim to lower the effective analysis threshold to the hardware trigger level of 2 photoelectrons (approximately 0.13 keV) using annual modulation analysis. While PMT-induced noise remains at this threshold, it can be statistically separated from potential WIMP signals, which would exhibit seasonal modulation. In this presentation, we will present the current status of the low-threshold analysis, event selection techniques, and future prospects for probing low-mass WIMP-nucleon scattering using the full COSINE-100 dataset.

Collaboration you are representing

COSINE-100

Author: KIM, Wonkyung (University of Science & Technology (UST), IBS School)

Presenter: KIM, Wonkyung (University of Science & Technology (UST), IBS School)

Session Classification: Poster session

Track Classification: Dark Matter and Its Detection