

GPU based track finding for muon g-2/EDM experiment at J-PARC

The quest for precise measurements of the muon's magnetic moment, prompted by the observed discrepancy between theoretical and experimental results by other experiments worldwide, is the motivation of the upcoming muon g-2/EDM experiment at J-PARC. The precise reconstruction of the positron tracks from muon decays plays a vital role, which is currently accomplished by a Hough transformation technique. However, due to the track-finding bottleneck in the reconstruction pipeline, a 40-fold reduction in computational time is essential. Here, we present the overview and status of a GPU-based approach to address this problem. The basic idea is to leverage GPU's (Graphics Processing Units) capability to optimize the track finding through parallel execution utilizing multiple GPU threads, allowing for significant acceleration in computation. Initial studies have shown encouraging results but also indicate additional refinements are required for high pileup conditions.

Track type

Flavour Physics

Author: CHETRI, Hridey

Co-authors: SAMUEL, Deepak (Central University of Karnataka); Ms N, Saranya (Central University of Karnataka); SANDILYA, Saurabh (Indian Institute of Technology Hyderabad); SUEHARA, Taikan (ICEPP, The University of Tokyo (JP)); YAMANAKA, Takashi (Kyushu University); MIBE, Tsutomu; OKAZAKI, Yuuta (KEK)

Presenter: CHETRI, Hridey

Session Classification: Poster Session