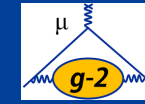


Material Effects and Crystal-Level Energy Calibration for Calorimeters used in Muon g-2 Experiment at Fermilab



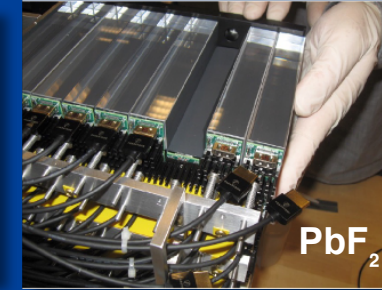
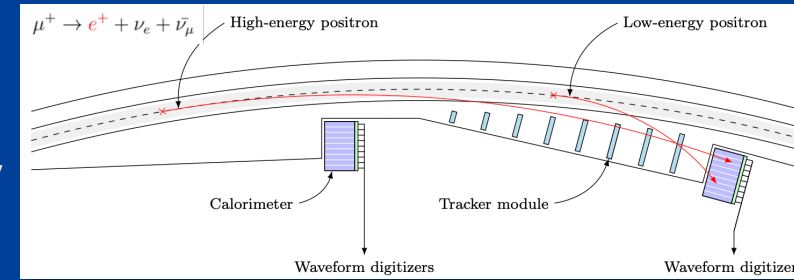
李政道研究所
TSUNG-DAO LEE INSTITUTE

Siew Yan Hoh Tsung-Dao Lee Institute, Shanghai Jiao Tong University

Poster No. B1

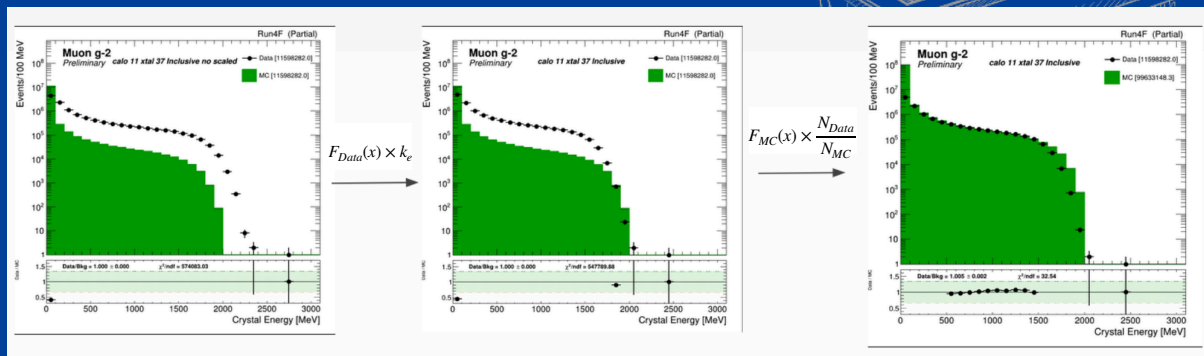
Motivation

1. The ω_a is related to the positron hit times and energies measured from 24 calorimeters, reconstructed from the energy deposition in PbF_2 arrays.
2. This study assess the accuracy of material effects on the crystal-level energy spectrum, potentially introducing systematic uncertainties to the ω_a .



Methods

1. The positron data and simulated energy deposition are prepared in same phases in a defined time window.
2. Energy scale constant, k_e is computed and optimized based on the minimized test statistics from Kolmogorov-Smirnov test.
3. The agreement is assessed by comparing scaled data and normalized simulated samples.



Results

1. Identified an average energy scale discrepancy of 0.87 in the central region, indicating unaccounted effects from the simulation.
2. Observed sub-optimal modeling of energy spectrum near the edge and corner crystals due to material budge effects.
3. This method can recalibrate and verify the reliability of the lost-muon-based energy calibration constant.

