

Precession Frequency Analysis of the E989 Muon $g-2$ Experiment's Run 1 Dataset

Wednesday, July 29, 2020 3:45 PM (15 minutes)

The E989 Muon $g-2$ Experiment at Fermilab aims to measure the muon magnetic anomaly, a_μ , more precisely than the previous experiment at Brookhaven National Laboratory. There stands a greater than 3 standard deviations discrepancy between the Brookhaven measurement of a_μ and the theoretical value predicted using the Standard Model. The Fermilab experiment seeks to either resolve or confirm this discrepancy, which may be an indication of new physics. Measuring a_μ requires a precise determination of the muon anomalous precession frequency (spin precession relative to momentum) and the average magnetic field seen by the muons as they circulate in a storage ring. The anomalous precession frequency is imprinted on the time-dependent energy distribution of decay positrons observed by 24 electromagnetic calorimeters placed around the inside of the ring. A suite of pulsed NMR probes continually monitors the magnetic field. This talk will present the precession frequency analysis of the 2018 Run 1 dataset, which is similar in size to the entire Brookhaven dataset.

Secondary track (number)

Primary author: FIENBERG, Aaron (Penn State University)

Presenter: FIENBERG, Aaron (Penn State University)

Session Classification: Beyond the Standard Model

Track Classification: 03. Beyond the Standard Model