

Measurement of the anomalous spin precession frequency ω_a in the Muon $g-2$ experiment at Fermilab

Thursday 18 July 2024 11:00 (15 minutes)

The Muon $g-2$ Experiment at Fermilab aims to measure the muon magnetic moment anomaly, $a_\mu = (g-2)/2$, with a final accuracy of 0.14 parts per million (ppm). A 3.1-GeV muon beam is injected into a storage ring of 14 m diameter, in the presence of a 1.45 T magnetic field. The anomaly a_μ can be extracted by accurately measuring the anomalous muon spin precession frequency ω_a , based on the arrival time distribution of decay positrons observed by 24 calorimeters, and the magnetic field. In 2023, the experiment published a result based on the 2019 and 2020 datasets, reaching the unprecedented sensitivity of 0.20 ppm. In this talk, I will outline the major systematic uncertainties on the ω_a frequency and provide an overview of the ongoing ω_a analysis for the last three datasets, collected from 2020 to 2023, along with the projected uncertainties on the final Muon $g-2$ measurement at Fermilab.

Alternate track

1. Beyond the Standard Model

I read the instructions above

Yes

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