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Measurement of the Muon Magnetic anomaly to 0.20 ppm by the Muon g-2 experiment at Fermilab

Tuesday 5 December 2023 09:05 (25 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. The experiment's first result published in 2021, based on Run-1 data collected in 2018, confirmed the previous result obtained at Brookhaven National Laboratory with a similar sensitivity. In 2023, the experiment published new results based on the 2019 and 2020 datasets, Run-2 and Run-3, which contain a factor of four more data than in Run-1, thus entering a new sensitivity regime to $g - 2$. In this talk, I will discuss the improvements in the accuracy of a_μ with respect to the Run-1 result, which allowed for a factor 2 improvement on both the statistical and systematic uncertainties, and the future prospects for the experiment. and for the Standard Model prediction for muon $g - 2$. I will then discuss the implications of the comparison of the new measurement with the last Standard Model predictions for muon $g - 2$.

Name of collaboration or list of co-authors

E989 (Muon g-2) collaboration at Fermilab

Primary author: COTROZZI, Lorenzo

Presenter: COTROZZI, Lorenzo

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