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Past, Present, and Future of Muon $g-2$

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There is a long history of experiments measuring the anomalous magnetic moment of the muon, going back to the first tests of QED in the 1950's and 60's. The experimental method employed by the Fermilab Muon $g-2$ Experiment (E989) – measuring the decay products from muons trapped in the uniform field of a storage ring – is a direct descendent of the CERN-III measurement conducted in the 1970's. Here we briefly step through advancements in the theoretical and experimental precision of $a_\mu \equiv (g-2)/2$ throughout the years to the present day. We then describe the most recent theoretical results and (updates to) experimental methods before looking to the future of the experiment.

Summary

Fermilab report number

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