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Run-2/3 measurement of the muon anomalous magnetic moment by the Muon g-2 experiment at Fermilab

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The Muon g-2 experiment at Fermilab seeks to measure the muon magnetic moment anomaly, $a_\mu = (g-2)/2$, with a final target precision of 0.14 parts per million (ppm). The experiment's initial result, published in 2021 using Run-1 data from 2018, confirmed the previous measurement at Brookhaven National Laboratory with a comparable sensitivity of 0.46 ppm. In 2023, new results from Run-2 and Run-3, based on data collected in 2019 and 2020, were released. These datasets contain four times the data from Run-1, significantly enhancing sensitivity and achieving an unprecedented uncertainty of 0.20 ppm. This advancement resulted in a two-fold improvement in both statistical and systematic uncertainties. In this talk, we will discuss the increased precision relative to the Run-1 result, provide an outlook on future measurements, and highlight the projected uncertainties for the final analysis, which will incorporate datasets from 2021 to 2023. Additionally, we will explore the implications of comparing the new measurements with the latest Standard Model predictions for muon g-2.

Author: ZAID, Estifa'a (university of liverpool)

Presenter: ZAID, Estifa'a (university of liverpool)

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