

Abstract Submitted
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Improving Magnetic Field Uniformity in the Muon g-2 Storage Ring RACHEL OSOFSKY, University of Washington, MUON G-2 COLLABORATION — The muon g-2 experiment at Fermilab (E989) aims to measure the anomalous magnetic moment of the muon a_μ to a precision of 140 ppb. This new measurement will shed light on the 3.5 sigma deviation between Standard Model calculations and the previous measurement (E821) at Brookhaven National Laboratory, and will test Standard Model extensions. The muon g-2 experiment measures the difference between the cyclotron and spin precession frequencies of muons in a highly uniform magnetic field, where the magnetic field over a muon's trajectory must be known to 70 ppb. The last passive step in achieving the required field homogeneity was the adjustment and installation of over 10,000 iron shims in and around the muon storage region. Higher order multipole moments of the magnetic field distribution across the storage region are controlled using 100 concentric coils located above and below the vacuum chambers. The current distribution in these so called surface coils is adjusted to reduce magnetic field variations across the storage region to less than 2 parts per million. An overview of the surface coil system, their calibration, and the current optimization procedure used to arrive at the final magnetic field in the magnetic storage region will be presented.

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