

Abstract Submitted  
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**Achieving a precision field in the muon g-2 storage ring magnet at Fermilab**<sup>1</sup> H. ERIK SWANSON, CENPA - University of Washington, THE MUON G-2 COLLABORATION COLLABORATION — The Muon g-2 Experiment at Fermilab will measure the anomalous magnetic moment  $a_\mu$  of the muon. The target precision is 140 parts per billion (ppb), a four-fold improvement over the previous Brookhaven E821 measurement which found a 3.5 standard deviation discrepancy from the Standard Model prediction. This precision requires knowing the magnetic field strength in the muon storage ring with an uncertainty of 70 ppb. The magnet is first shimmed to achieve an average uniformity of one part per million (ppm). The field in the muon storage volume will be periodically measured and continuously monitored using proton NMR with single shot precision of 10 ppb. This magnet was successfully commissioned in October, 2015 and the shimming of the field to achieve the ultimate uniformity has been ongoing since that time. We will present the final results of this year-long process, describing some of the unique instrumentation and analysis routines we have developed along the way.

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