

Abstract Submitted  
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**Magnetic Field Calibration for Fermilab Muon  $g-2$**  DAVID FLAY,  
Univ of Mass - Amherst — The Muon  $g - 2$  Experiment at Fermilab measures the anomalous magnetic moment of the muon,  $a_\mu$ , with improved precision compared to the previous experiment at Brookhaven National Lab. The Brookhaven result is in tension with the Standard Model by more than  $3\sigma$ . The determination of  $a_\mu$  requires the measurement of both the muon spin-cyclotron precession frequency  $\omega_a$  and the magnetic field  $B$  in terms of the free-proton precession frequency  $\omega_p$  that confines muons in the storage ring. The magnetic field is monitored by coordinated nuclear magnetic resonance (NMR) measurements. NMR probes are mounted in fixed locations above and below the storage region and continuously monitor the field. Roughly every three days, an in-vacuum trolley equipped with 17 NMR probes maps the muon storage region. In dedicated runs, the trolley is compared to a water-based NMR probe, converting trolley  $B$  measurements into corresponding values of  $\omega_p$ . In this talk, the calibration procedure and the analysis of data from the first physics run is presented. The author is supported by the DOE under Grant DE-FG02-88ER40415 and acknowledges support from the Fermi Research Alliance, LLC under Contract No. DE-AC02-07CH11359 with the U.S. DOE-OHEP.

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