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Measuring the Muon g-2 Magnetic Storage Field Via Proton Nuclear Magnetic Resonance MATTHIAS SMITH, University of Washington, MUON G-2 COLLABORATION COLLABORATION — The Muon $g-2$ experiment at Fermilab aims to measure the muon anomalous magnetic moment, a_μ, to a precision of 140 ppb, using a technique that determines the muon spin precession frequency in the highly uniform magnetic field of a storage ring. Both precession frequency and field determination contribute equally to the final systematic uncertainty. The magnetic field is determined from the measurement of free induction decay (FID) signals provided by a matrix of custom proton nuclear magnetic resonance (pNMR) probes. FID simulations show that we can achieve the required precision for extraction of field values compared to systematic contributions. The recently powered muon storage ring is providing data to evaluate the pNMR measurement results. We will describe the performance to date of this system.

Matthias Smith
University of Washington

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