

Abstract Submitted
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High Precision Magnetic Field Scanning System for the New Muon g-2 Experiment RAN HONG, Argonne National Laboratory, MUON G-2 COLLABORATION COLLABORATION — The New Muon g-2 Experiment (E989) at Fermilab will measure the anomalous magnetic moment of muon a_μ aiming at a precision of 140 ppb. This new experiment will shed light on the long-standing 3.5 standard deviation between the previous muon g-2 measurement (E821) at Brookhaven National Laboratory and the Standard Model calculation, and potentially discover new physics. The New Muon g-2 Experiment measures the precession frequency of muon in a uniform magnetic field, and the magnetic field experienced by the muons needs to be measured with a precision better than 70 ppb. For the measurement of the magnetic field in the muon storage region, the former trolley system from E821 with 17 NMR probes was refurbished and upgraded with new electronics, probes and a modern motion control system. A test solenoid magnet was set up at Argonne National Laboratory for calibrating the NMR probes and the precision studies of systematic uncertainties. In this presentation, we will describe the trolley motion control scheme, the trolley position measurement methods, the electronic system for activating and reading the NMR probes and the test solenoid facility.

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