

Abstract Submitted
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Magnetic field transients induced by pulsed kickers in the Muon $g-2$ experiment¹ JAREK KASPAR, University of Washington, FERMILAB MUON G-2 EXPERIMENT (E989) COLLABORATION — The Fermilab Muon $g-2$ experiment is a high-precision measurement of the anomalous magnetic moment of the muon aiming at a factor of four improvement over the previous effort at BNL. The experiment measures the spin precession frequency of the muon in a very uniform magnetic field. One source of magnetic field uncertainty is transient magnetic fields from eddy currents in the vacuum chambers induced by the pulsed kicker magnets. The field transients include fast exponentially decaying eddy currents following the kick, and slower transients induced by a mechanical motion of the kicker plates and mechanical vibrations of the vacuum chamber. These field transients are measured using a magnetometer based on Faraday rotation in a crystal of TGG. A precision better than 1 micro-Tesla is required, compared to the kick pulse strength of 26 milli-Tesla, on the background of the main magnet field of 1.45 Tesla. The magnetometer design, performance, and data analysis resulting in an upper limit on the magnetic field transients for the purpose of Run-1 publication will be presented.

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