Performance of the instrumentation for measuring ω_a in the Muon g-2 experiment KIM SIANG KHAW, Univ of Washington, MUON G-2 COLLABORATION — The Muon g-2 experiment at Fermilab will begin data taking in 2017. The precision goal of 140 ppb requires collecting 21 times more data than the BNL E821 experiment, which resulted in the now well-known $> 3\sigma$ deviation between measurement and the Standard Model prediction. In addition the systematic uncertainties must be reduced by a factor of 3. To this end, an all-new detector and electronics instrumentation used to determine the anomalous precession frequency was designed. We report here on a recent test-beam run at SLAC that acquired realistic data from initial calorimeter calibration through fully reconstructed offline analysis. We will report on the performance of the following state-of-the-art systems: laser-based calibration network, PbF_2 calorimeter with ultra-fast SiPM readout, custom 800 MSPS 12-bit digitizers, online DAQ with an active GPU processing farm, and finally *art*-based offline framework. The combination of a mono-energetic multi-GeV electron beam and a sophisticated fast laser firing sequence enabled data to be taken at a variety of rates under controlled conditions. These tests provided crucial information regarding the needed performance for the systematics and established the capability of the instrumentation to handle high data rate.

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