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Measuring the anomalous precession frequency ω_a for the Muon $g-2$ Experiment[1] JASON HEMPSTEAD, University of Washington, MUON G-2 COLLABORATION — The magnetic anomaly of the muon a_μ hints at new physics with a greater than 3 standard deviation discrepancy between the measurement performed at Brookhaven National Lab and the Standard Model prediction. To clarify (or resolve) the disparity, the ongoing Muon $g-2$ Experiment at Fermilab has accrued a dataset larger than that of its predecessor experiment. The magnetic anomaly is directly proportional to the rate at which a muon's spin precesses relative to its momentum in a magnetic field, ω_a. Decay positron energies, measured using 24 highly gain-stabilized calorimeters, carry information about the spin distribution of the parent muons; higher energy positrons are more likely emitted in the direction of the muons' spins. Determination of ω_a is made from fitting the time-dependent distribution of positron energies using several methods: setting a lower threshold on the positron energy; taking a ratio of time-shifted histograms; and an asymmetry weighting technique based on positron energies. Corrections must be made for muons that exit the storage region before decaying, beam betatron motions, and rate-dependent pileup in the detectors. The process of measuring ω_a and associated systematic errors will be presented in the context of Run 1 data.

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