

# The positron reconstruction at the Muon $g-2$ Experiment

*Tuesday, 16 May 2023 18:25 (15 minutes)*

In April 2021, the E989 Muon  $g - 2$  collaboration at Fermilab published a measurement of the muon anomaly ( $a_\mu$ ) based on the Run-1 dataset with 0.46 ppm precision. The measured value confirmed the previous BNL experiment and increased the discrepancy with the Theory Initiative (2020) theoretical value to  $4.2\sigma$ . A new publication with a precision improved by factor 2 is expected for this Summer. The experimental technique requires a precise determination of the muon anomalous precession frequency based on the calorimeter data. This talk will discuss the reconstruction of the decay positrons observed by the calorimeters, the state of the art gain calibration system, and the analysis techniques employed to achieve a lower than 50 parts per billion systematic uncertainty on the precession measurement.

**Primary author:** GIROTTI, Paolo (Pi)

**Presenter:** GIROTTI, Paolo (Pi)

**Session Classification:** Young Researchers Talks