



## **Evaluating the Muon $g-2$ calorimeters as a beam diagnostic tool**

*Saturday 6 August 2016 18:00 (2 hours)*

The Muon  $g-2$  experiment at Fermilab will measure the anomalous magnetic moment of the muon to a precision of 0.14 parts per million. The measurement will rely on detailed knowledge of the muon beam profile in the storage ring. A suite of 24 segmented lead-fluoride calorimeters will provide energy, time, and position information about the decay positrons. Calorimeter data will primarily be used to determine the muon spin precession frequency, but will also provide measurements essential to controlling systematic uncertainties related to distortion of the closed orbit, betatron tunes, and knowledge of the beam energy and energy spread. Three tracking detectors and two fiber beam monitors will also provide beam information; the calorimeters have the advantage of being located every 15 degrees around the entire ring. Furthermore, while the fiber beam monitors will only be used during beam commissioning, the calorimeters will always be active, and will help us monitor the beam on a run-by-run basis. We use beam and detector simulations to develop algorithms for extracting muon beam parameters from calorimeter data.

**Primary author:** BJORKQUIST, Robin (Cornell University)

**Presenter:** BJORKQUIST, Robin (Cornell University)

**Session Classification:** Poster Session

**Track Classification:** Accelerator: Physics, Performance, R&D and Future Accelerator Facilities