

Muon g-2 Shutdown Mini-Review, June 13, 2018 - CHARGE

Recently the Muon g-2 experiment completed commissioning and started the first physics data-taking run. The primary goal of the experiment is to measure the muon's anomalous magnetic moment with a precision of 140 parts per billion, a four-fold improvement over the result from the BNL E821 experiment, to shed light on the >3 sigma deviation from the theoretical predictions seen by E821. The size of the data sample accumulated by the experiment during the currently ongoing data-taking run has recently surpassed that of the E821 experiment, while the experiment has not yet reached its design data accumulation rate.

With several months of running complete, work is now being planned for the summer 2018 accelerator shutdown to address performance issues. We ask the committee to comment on the performance of the experiment so far with respect to its performance goals, and on the readiness of the experiment to successfully execute the work planned for the shutdown.

Specifically:

1. How does the performance of the experiment in 2018 compare to the design? At the current performance, and assuming 42-week runs in FY19 and FY20, what is the projected experimental sensitivity compared to the 140 ppb design goal?
2. What are the priorities of the experiment for the shutdown, and what are the consequences if specific tasks are not carried out during summer 2018 shutdown? What is the expected effect of the planned improvements on the experimental sensitivity?
3. Has a detailed task list and work plan for the shutdown been developed? What are the technical and schedule risks associated with each task? Have the required resources (both Fermilab and the rest of the collaboration) to perform and manage the work been identified and secured? What is the expected M&S cost of each task?
4. If options for work to be performed still exist, what is the process to make these choices and when will they be made? In particular, what options are still under consideration for the kicker repairs, and has a decision been made on the installation of the new inflector?
5. What work is required to complete the recommendations from the Kephart review?

We request a brief written closeout report from the committee by Friday, June 22, 2018.