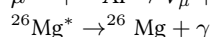
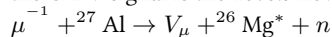


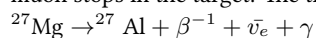
## Normalization of the Mu2e Charged Lepton Flavor Violation Experiment

Wednesday, 14 July 2021 16:15 (15 minutes)

The Mu2e experiment will search for Beyond-the-Standard-Model, Charged Lepton Flavor Violation (CLFV) in muon capture  $\mu^- + \text{Al} \rightarrow e^- + \text{Al}$ , with a single event sensitivity surpassing the current world's best limit by 10,000 times. To report a reliable result, the number of stopped muons will be normalized to 10% precision utilizing a combination of two  $\gamma$ -ray and one x-ray transitions. The first, directly proportional to the CLFV signal is the 1808.7 keV  $\gamma$ -ray emitted promptly in the muon capture process,



The second, is the 346.8 keV x-ray emitted promptly from the  $2p \rightarrow 1s$  muonic atomic transition in Al, from muon stops in the target. The third, is the 844 keV  $\gamma$ -ray from the  $\beta$ -decay



where  ${}^{27}\text{Mg}$  is produced in the muon capture process, and decays with a lifetime of 9.5 minutes.

The stopped-muon rate measurement will use two complementary photon counting detectors. One of them, the LaBr<sub>3</sub> detector, is capable of high rate operation up to and above 800 kcps, with 0.7 % energy resolution.

The other, the HPGe detector is capable of energy resolution of 0.1%, however, its rate capability is limited to an estimated  $\sim 100$  kcps.

### Are you are a member of the APS Division of Particles and Fields?

No

**Primary author:** CHEN, Jijun

**Co-authors:** EDMONDS, A; BHIRANGI, A; BARKER, J; CAO, H; CHISLETT, R; FERRARI, A; GERSABECK, M; GINTHER, G; GLASS, H; H, Casler; HARKNESS-BRENNAN, L; HUANG, S; JUDSON, D; KENNY, V; KNODEL, O; LANCASTER, M; KOLTICK, D; MILLER, J; MOTUK, E; MULLER, S; QUIRK, J; LYNCH, K; TRAN, N; POPP, J

**Presenter:** CHEN, Jijun

**Session Classification:** Lepton Flavor and Precision Measurements

**Track Classification:** Lepton Flavor and Precision Measurements