

# A data-driven method to estimate the antiproton background in Mu2e

Friday 19 July 2024 20:40 (20 minutes)

The Mu2e experiment will search for the CLFV process of neutrinoless coherent conversion of muon to electron in the field of an Al nucleus. The experimental signature is a monochromatic conversion electron with energy  $E_{CE} = 104.97$  MeV/c. One of the possible background processes is  $\bar{p}s$  produced by the proton beam at the Production Target, annihilating in the ST. The background expected from  $\bar{p}$  is very low but highly uncertain. It cannot be efficiently suppressed by the time window cut used to reduce the prompt background. Therefore, we have developed a method for the in-situ measurement of this background. In Mu2e,  $p\bar{p}$  annihilation in the ST is the only source of events with multiple tracks coming from the ST, simultaneous in time, each with a momentum in the signal window region. We exploit this unique feature and reconstruct the multi-track events to estimate the  $\bar{p}$  background by comparison.

## Alternate track

1. Beyond the Standard Model

## I read the instructions above

Yes

**Primary author:** CHITHIRASREEMADAM, Namitha (University of Pisa)

**Co-authors:** Dr MURAT, Pavel (Fermilab); Dr DONATI, Simone (University of Pisa)

**Presenter:** CHITHIRASREEMADAM, Namitha (University of Pisa)

**Session Classification:** Poster Session 2

**Track Classification:** 05. Quark and Lepton Flavour Physics