Contribution ID: **777** Type: **Parallel session talk**

Design and construction status of the Mu2e crystal calorimeter

Friday 30 July 2021 09:45 (15 minutes)

The Mu2e experiment at Fermi National Accelerator Laboratory searches for the charged-lepton flavor violating neutrino-less conversion of a negative muon into an electron in the field of an aluminum nucleus. The dynamics of such a process is well modelled by a two-body decay, resulting in a mono-energetic electron with energy slightly below the muon rest mass (104.967 MeV). Mu2e will reach a single event sensitivity of about 3x10–17 that corresponds to four orders of magnitude improvement with respect to the current best limit.

The calorimeter requirements are to achieve an energy resolution better than 10% and a timiong resolution better than 500 ps at 100 MeV in order to provide the needed μ/e particle identification, an online trigger filter while aiding the track reconstruction capabilities. It consists of two disks of un-doped CsI crystals, each one read out by two large area UV-extended SiPMs.

In this talk, the status of construction and QC performed on the produced crystals and photosensors, the development of the rad-hard electronics and the most important results of the irradiation tests done on the different components are summarized. The production of electronics is underway and we will summarize the QC test performed on the analog electronics and on the integrated SIPM+FEE units. Construction of the mechanical parts is also progressing well. Status and plans for the final assembly are also described. We expect to start assembly of the disk in summer 2021 assuming that the pandemics status will allow the INFN team to be present at Fermilab.

In the meanwhile, a complete vertical slice test with the final electronics is in progress on the large calorimeter prototype, dubbed Module-0, at the Frascati Cosmic Rays test stand. First calibration and performance results will be shown.

Collaboration / Activity

Mu2e / calorimeter

First author

Email

Primary author: DIOCIAIUTI, Eleonora

Co-author: MISCETTI, Stefano (INFN)

Presenter: DIOCIAIUTI, Eleonora

Session Classification: T12: Detector R&D and Data Handling

Track Classification: Detector R&D and Data Handling