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# Design and test of the Mu2e undoped CsI crystal calorimeter

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The Mu2e experiment at Fermilab will search for the charged-lepton flavour violating neutrino-less conversion of a negative muon into an electron in the field of an aluminum nucleus.

The Mu2e detector is composed of a tracker and an electromagnetic calorimeter and an external veto for cosmic rays.

The calorimeter plays an important role in providing excellent particle identification capabilities, a fast online trigger filter while aiding the track reconstruction capabilities.

The calorimeter requirements are to provide a large acceptance for  $\sim 100$  MeV electrons and reach:

- 1) a time resolution better than 0.5 ns @ 100 MeV;
- 2) an energy resolution  $O(10\%)$  @ 100 MeV;
- 3) a position resolution of 1 cm.

The calorimeter consists of two disks, each one made of 674 undoped CsI crystals readout by two large area  $2 \times 3$  array of UV-extended SiPMs of  $6 \times 6$  mm<sup>2</sup> dimensions.

A large scale prototype has also been constructed and tested at the beam test facility in Frascati.

It consists of 51 pre-production crystals readout by two Mu2e SiPM.

We present the progresses done to complete the calorimeter design as well as a summary of results obtained in the production of components and on the test beam of the prototype.

## Secondary topics

Silicon photosensors, radiation hardness, calorimeter systems

## Applications

Design concepts for future calorimeter at the intensity frontier

## Primary topic

Crystals

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