Contribution ID: **20** Type: **not specified**

Production and quality assurance of Mu2e CsI crystals

Tuesday 22 May 2018 08:55 (20 minutes)

The Mu2e calorimeter is composed by two disks of 1348 pure CsI crystals of 34 x 34 x 200 mm^3 dimension, each one readout and coupled in air by two large area SiPMs.
The calorimeter requirements translate in a series of technical specifications
for the crystals that are summarized by the following list when the crystal
is readout by a PMT and illuminated with a ^{22}Na source:
(1) dimension tolerance: $\pm$100 um;
(2) high Light Yield, $>$100 photoelectrons/MeV;
(3) Longitudinal response uniformity < 5\%;
(4) energy resolution less than 19\%;
(5) ratio between the scintillation light fast component over the total one better than 75\%.
In order to not affect calorimeter performance, the crystals have also to withstands the following requirements:
(6)A radiation induced noise below 0.6 MeV for a dose rate of 1.8 rad/hour.
(7) A normalized LY after 10 (100) krad $>$ 85\% (60\%).

A detailed quality assurance will be performed on each production crystals. Automatized station have been designed and constructed at the National Lab of Frascati.
The measurement of the radiation hardness for a small random sample
of the production group will be performed at Caltech/HZDR.
A summary of the techniques used will be presented.

Secondary topics

Applications

Design concepts for future calorimeter at the intensity frontier

Primary topic

Crystals

Authors: Dr STEFANO, MIscetti (LNF-INFN); Dr ZHU, Ren-Yuan (Caltech)

Presenter: Dr ZHU, Ren-Yuan (Caltech)

Session Classification: Session 5