

Quality control of LYSO:Ce crystals for the CMS barrel MIP Timing Detector

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The MIP Timing Detector (MTD) is a new sub-detector planned for the Phase 2 upgrade of the CMS experiment at the CERN LHC, designed to measure the time-of-arrival of charged particles with a resolution of 30-60 ps. The barrel region of MTD (Barrel Timing Layer, BTL) is made of arrays of Cerium-doped Lutetium-Yttrium Oxyorthosilicate (LYSO:Ce) scintillating bars, readout by silicon photo-multipliers arrays. The quality of BTL LYSO crystals in the production phase is being monitored in a dedicated laboratory in INFN-Rome1, for a sample of arrays and single crystals. In order to ensure mechanical compatibility in the detector assembly, arrays undergo dimensional measurements. Performances of LYSO arrays and single crystals are checked by measuring light output, decay time, optical cross-talk, time resolution, and transmittance. Radiation hardness of the samples against ionizing radiation by gamma rays are studied at the Calliope facility of ENEA-Casaccia Research Centre.

Alternate track

1. Detectors for Future Facilities, R&D, Novel Techniques

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Yes

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