

Precision Timing with LYSO:Ce Crystals & SiPM Sensors for the CMS MTD Barrel Timing Layer

Thursday, 28 May 2020 11:00 (18 minutes)

The central Barrel Timing Layer (BTL) will be based on LYSO:Ce crystals read out with silicon photomultipliers (SiPMs). The BTL will use elongated crystal bars, with double-sided read out, with a SiPM on each end of the crystal, in order to maximize detector performance within the constraints of space, cost, and channel count. We will present an overview of the MTD BTL design, detailed in the recently released technical design report, and will review the extensive R&D studies carried out to optimize the MTD BTL crystal-based technology and the test beam results in which the goal of 30 ps timing resolution has been achieved. We will also present progress in the development of the dedicated readout electronics for the BTL, as well as a brief overview of the overall mechanics, cooling, and plans for system tests, installation, and integration into CMS.

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