



Contribution ID: 4

Type: Oral

Studies of time resolution, light yield, and crosstalk using SiPM-on-tile calorimetry for the future Electron-Ion Collider

Tuesday, 7 November 2023 16:15 (15 minutes)

We recently proposed a high-granularity calorimeter insert for the EIC, which uses plastic scintillator tiles read out by silicon photomultipliers. In this talk, we present findings that characterize its fundamental components through measurements of light yield, optical crosstalk, and timing resolutions. These measurements were conducted using cosmic rays, an LED, and a beta source. We also compared two methods for optically isolating cells: one using “megatiles” with grooved boundaries between cells, and another using a 3D-printed plastic frame to host individual cells. Our results indicate that the 3D-printed frame effectively eliminates optical crosstalk and simplifies the assembly process. This presentation is based on results published in JINST 18 (2023) 05, P05045.

Early Career

Yes

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Session Classification: RDC9

Track Classification: RDC Parallel Sessions: RDC9: Calorimetry