



Contribution ID: 156

Type: Oral presentation (in person)

Test beam experiment of the large prototype of high granularity scintillator calorimeter for future electron-positron colliders -performance evaluation -

Future electron-positron colliders, including the International Linear Collider (ILC) and the Circular Electron Positron Collider (CEPC), are currently proposed for the precise measurement of the Higgs boson. These projects require high-resolution scintillator calorimeters to achieve fine granularity. Our research focuses on the development of potential calorimeter options, namely the Scintillator Electromagnetic Calorimeter (Sc-ECAL) and the Analog Hadron Calorimeter (AHCAL). These are sampling calorimeters that use plastic scintillator cells as detection layers, with absorber layers that generate showers and detection layers that capture particles from these showers alternately arranged. To demonstrate the capabilities of these calorimeters, a prototype consisting of 32 layers of ECAL and 40 layers of HCAL, reflecting the actual device design, was constructed. Between April and June 2023, a beam test using this integrated prototype was conducted at CERN. The tests involved muons (10, 100, 120 GeV), electrons (0.5–250 GeV), and pions (1–350 GeV) to evaluate the energy response and resolution of ScECAL and AHCAL for electrons and pions. This presentation will outline each detector and the beam test, and report the analysis results concerning the performance of the detectors during the beam tests.

Apply for poster award

Yes

Primary authors: MURATA, Tatsuki; TAKATSU, Taisei (ICEPP)

Presenter: TAKATSU, Taisei (ICEPP)

Session Classification: Calorimetry, Muon detectors

Track Classification: Physics and Detector: Calorimetry, Muon