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FoCal-H Development and Performance Evaluation with H2GCROC

The Forward Calorimeter (FoCal) is a new sub-detector for ALICE, planned for installation during Long Shutdown 3, designed to have unique capabilities for measuring direct photon production at forward rapidity. FoCal-H, the hadronic calorimeter segment of this upgrade, is designed as a scintillating-fiber calorimeter. Its front-end electronics utilize the H2GCROC ASIC to read out signals from SiPMs. This ASIC features 72 channels and delivers both energy and timing information for input signals, with key functionalities such as Time-over-Threshold (ToT) measurement and a current conveyor stage, essential for efficient hadronic calorimeter readout.

The H2GCROC performance was evaluated in 2024 with the FoCal-H prototype during beam tests conducted at the SPS beamline. These tests employed a fully customized hardware system based on the Xilinx KCU105 evaluation board and software built with the PySide framework. We will present an overview of the FoCal-H project, including the detailed analysis of energy resolution, response linearity, and timing performance observed in the beam tests.

Category

Experiment

Collaboration (if applicable)

ALICE

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