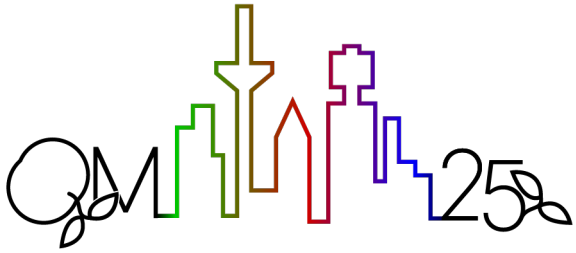

Contribution ID: **189** Type: **Poster**

Development of a versatile preamplifier with extensive readout capabilities for high-energy nuclear experiments.

In high-energy physics experiments, silicon detectors play an important role in the discovery of new physical phenomena. In the research and development of detectors with silicon pad sensors, a simple preamplifier is essential to evaluate the performance of silicon pad sensors. We have therefore developed a versatile readout circuit for detectors that can be used in both test beam and laboratory environments with a simple setup. This preamplifier is a simple design consisting of a charge-sensitive amplifier, a filter circuit, and an inverting amplifier. The main features of this preamplifier are wide frequency bandwidth, low noise, and ease of setup. An infrared laser system is used to verify the silicon pad (320-μm silicon thickness, 1 cm x 1 cm for the single cell) with the preamplifier we developed.
In this poster, we evaluate the performance of this preamplifier by measuring the minimum ionized particle (MIP) with a 320 μm silicon pad sensor using a 3 GeV/c positron beam at the PF-AR test beamline at KEK and a 0.8 GeV/c electron beam at ELPH at Tohoku University.

Category

Experiment

Collaboration (if applicable)

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Session Classification: Poster session 1

Track Classification: Detectors & future experiments