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Readout Electronics for Scintillating Fiber-based Muon Beam Monitor in COMET Experiment

This paper presents the design of readout electronics for Muon Beam Monitor in COMET (Coherent Muon to Electron Transition) experiments. The Muon Beam Monitor in this experiment is a mesh structure consisting of a total of 256 Scintillating Fibers (SCSF-3HF) in two vertical directions, respectively. For the purpose of profiling the muon beam, electronics are required to measure the time-origin and the position of the incoming particles. SiPM 13360-1350PE produced by Hamamatsu is used as the photosensor. The weak current signal is converted into a voltage signal through a $50\ \Omega$ resistor. The ASIC MaPMT is applied to process the small voltage signal to generate the initial hit information. MaPMT has 64 channels, each with integrated amplification and over-threshold screening circuitry. After the initial hit information is collected, it needs to be filtered by the trigger unit for further compliance. The valid data will be packaged and transmitted to the server. The electronics design is now complete. The beamline will run tentatively in June and beam testing of the Muon Beam Monitor will be conducted at that time.

Minioral

Yes

IEEE Member

No

Are you a student?

Yes

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