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Performance evaluation and electronics development of a new inner-station TGC detector for the ATLAS experiment at HL-LHC

This poster presents the performance evaluation and electronics development of a new inner-station Thin Gap Chamber (TGC) detector for the ATLAS experiment at HL-LHC. The ATLAS experiment at HL-LHC aims to obtain up to 4000 fb^-1 of proton collision data to improve the sensitivity for the search of new particles, including candidates for dark matter. To select interesting events from the vast amount of data, upgrades for detectors and trigger systems are being developed. The TGC detectors located inside the magnetic field region will be changed from 2 layers to 3 layers to suppress low-momentum muons and charged particles not directly originating from proton-proton collisions. The first module of the new TGC detectors has been assembled, and the performance was evaluated with a DAQ system based on SoC devices. The noise level and detection efficiency have been obtained. In addition, the coincidence logic for the new TGC detectors has been developed and validated using simulation with straight tracks.

Abstract for a poster

all program topics can be contemplated

Primary author: WADA, Arisa (Nagoya university)

Presenter: WADA, Arisa (Nagoya university)