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The Study of Multi-Layer sTGC Test System for ATLAS Phase-I upgrade

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ATLAS is one of the four experiments at Large Hadron Collider(LHC).LHC will be upgraded in the next several years aiming to new physics study. ATLAS experiment will fulfill Phase-I upgrade by 2020. The current ATLAS muon end-cap system(Small Wheel, SW) will be replaced with a completely New Small Wheel(NSW). The NSW is a set of precision tracking and trigger detectors able to work at high rates with excellent real-time spatial and time resolution. The small-strip Thin Gap Chamber(sTGC) will devote to trigger function in NSW. sTGC contains pad, wire and strip readout. The pads on the four-layer sTGC quadruplets are used through a 3-out-of-4 coincidence to identify muon tracks roughly pointing to the interaction point(IP). They are also used to define which strips need to be readout to obtain a precise measurement in the bending coordinate for the event selection. The signals from strips and pads of sTGC quadruplets will be readout by two different front-end boards(FEB), strip FEB(sFEB) and pad FEB(pFEB), respectively. The FEB boards are mounted on the sTGC quadruplets.
This paper presents the study of multi-layer sTGC test system, and it is named Front End Boards Driver Card (FEBDC), which has the capability of handling four sFEBs and four pFEBs simultaneously. The connection and communication between FEBDC and the eight p/sFEBs are the same as a real sTGC Readout system. So the front-end chips on FEBs can be configured by the FEBDC and the raw data for the hit-events can be readout and sent to the FEBDC.

Minioral

Yes

Description

STGC DAQ board

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