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Cooling & Timing Tests of the ATLAS Fast Tracker VME boards

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The Fast Tracker Processor (FTK) is an ATLAS trigger upgrade built for full event, low-latency, high-rate tracking. The FTK core, made of 9U VME boards, performs the most demanding computational task. The "Associative Memory Board Serial Link Processor" (AMBSLP) and the "Auxiliary card" (AUX), plugged on the front and back sides of the same VME slot, constitute the Processing Unit (PU), which finds tracks using hits from 8 layers of the inner detector. The PU works in pipeline with the "Second Stage Board" (SSB), which finds 12-layer tracks by adding extra hits to the identified tracks. In the designed configuration, 16 PUs and 4 SSBs are installed in a VME crate. The high powerconsumption of the AMBSLP, AUX and SSB (respectively 250 W, 70 W and 160 W per board) required the development of a custom cooling system. Even though the consumption expected for

each VME crate of the FTK system is high compared to a common VME setup, the 8 FTK core crates will use \sim 50 kW, which is just a fraction of the power and the space needed for a CPU farm performing the same task.

We report on the integration of 32 PUs and 8 SSBs inside the FTK system, on the infrastructures needed to run and cool them, and on the tests performed to verify the system processing rate and the temperature stability at a safe value.

Minioral

Yes

IEEE Member

No

Are you a student?

No

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