

Upgrade of the ATLAS Monitored Drift Tube Frontend Electronics for the HL-LHC

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The monitored drift tube (MDT) chambers are the main component of the precision tracking system in the ATLAS muon spectrometer, capable of measuring the sagitta of muon tracks to an accuracy of $60\text{ }\mu\text{m}$, which corresponds to a momentum accuracy of about 10% at $p_T=1\text{ TeV}$. To cope with large amount of data and high event rate at HL-LHC, the present MDT readout electronics will be replaced and the MDT detector will be used at the first-level trigger with an output event rate of 1 MHz and a latency of $\sim 6\text{ }\mu\text{s}$. Prototypes for two frontend ASICs, a frontend mezzanine card and a data transmission board have been realized and tested. The design of a mobile mini-Data Acquisition system is ongoing and will be crucial for testing newly-built small-diameter MDT chambers with new frontend electronics prototypes and for future integration and commissioning. I will present the overall design of MDT frontend electronic system, results from ASIC and board prototypes and tests using the miniDAQ system.

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