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Performance of new front-end electronics for the Phase-II upgrade of the ATLAS small-diameter Monitored Drift Tube detector

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The Monitored Drift Tube (MDT) detector will be used at the first-level trigger to improve the muon transverse momentum resolution and thus reduce the muon trigger rate for high-luminosity LHC runs. The small-diameter MDT (sMDT), with half the drift-tube diameter of the MDT and using the same readout electronics, will be installed in detector regions where MDT chambers will not fit. A new trigger and readout system has been proposed and the current readout electronics will be replaced. A new analog Application-Specific Integrated Circuit (ASIC) of Amplifier/Shaper/Discriminator circuit and a new digital ASIC of time-to-digital converter (TDC) are developed. Front-end boards integrating these ASICs are developed and tested. In this talk, we will show performances of these ASICs and joint test results with sMDT chambers.

Primary author: GUO, Yuxiang (University of Michigan)

Presenter: GUO, Yuxiang (University of Michigan)

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