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Status of the Precision Drift Tube Chambers for the ATLAS Muon Spectrometer

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Content

The Muon Drift Tube (MDT) chambers provide very precise and reliable muon tracking and momentum measurement in the ATLAS muon spectrometer. Already in run 2 of the LHC they have to cope with very high background counting rates up to 500 Hz/cm2 in the inner endcap layers. At High-Luminosity LHC (HL-LHC), the background rates are expected to increase by almost a factor of 10. New small (15 mm)-diameter Muon Drift Tube (sMDT) chambers have been developed for upgrades of the muon spectrometer. They provide an about an order of magnitude higher rate capability and allow for the installation of additional RPC trigger chambers in the barrel inner layer of the muon detector for HL-LHC. They have been designed for mass production and achieve a sense wire positioning accuracy of 5 microns. A pilot project for the barrel inner layer upgrade is on the way for the 2019/20 LHC shutdown. Several sMDT chambers have already been installed and operated in the ATLAS detector.

Summary

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