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Performance of the ATLAS New Small Wheels in preparation for LHC Run-3 data taking

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The muon spectrometer of the ATLAS detector has recently undergone a major upgrade in preparation for operation under experimental conditions foreseen at the High-Luminosity LHC (HL-LHC). Two New Small Wheels (NSW) have been constructed and installed to replace the first muon stations in the high-rapidity regions of ATLAS detector. This new system is designed to provide improved muon trigger momentum resolution and fake rate rejection in the forward region of the detector, in order to maintain the current ATLAS physics capability under the higher background environment of HL-LHC. The NSW has an active area of more than 1200 m^2 and is equipped with with multiple layers of two novel detector technologies: small-strips Thin Gap Chambers (sTGC) and Micromegas (MM). With an active area of more than 1200 m^2, the ATLAS New Small Wheels are the first large scale use of Micromegas technology in high-energy experiments. Latest results from the commissioning of the NSW in preparation for the LHC Run-3 data taking, as well as initial performance measurements, will be presented.

In-person participation

Yes

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