

ATLAS New Small Wheel Performance Studies with 2023 (LHC Run3) data

Friday, 31 May 2024 08:30 (20 minutes)

Following the successful completion of Phase I upgrades during LHC Long Shutdown 2, the ATLAS detector has been operational since 2022 with various implemented upgrades. The most important and challenging upgrade is in the Muon Spectrometer, where the replacement of the two inner forward muon stations with the New Small Wheels (NSW) system introduces two novel detector technologies: small strip Thin Gap Chambers (sTGC) and resistive strips Micromegas (MM).

The installation and integration of the two NSW endcaps in ATLAS for LHC-Run3 data collection marks the culmination of extensive construction, testing, and installation efforts. The NSW actively contribute to the muon spectrometer tracking and trigger systems, concurrently finalizing the commissioning phase of this innovative system.

Substantial work has been invested in the operation of the new data acquisition system, as well as the implementation of a new processing chain within the muon software framework.

The new detectors are fully integrated into the ATLAS trigger, reconstruction and simulation software. Tracking is being optimized taking in consideration the alignment of each individual detector module by the ATLAS Muon Spectrometer optical alignment system and the deviations from the nominal geometry of all the constituent elements of each module.

This presentation will offer an overview of the strategies employed for simulations, reconstruction, and optimization, followed by a detailed report on the performance studies of the NSW system during its initial operation with LHC Run3 data.

Collaboration

ATLAS Muon

Role of Submitter

The presenter will be selected later by the Collaboration

Presenter: ROSATI, Stefano (INFN - Roma 1)

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