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Results from muon reconstruction performance with ATLAS at Run-3

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Muon reconstruction performance plays a crucial role in the precision and sensitivity of the Large Hadron Collider (LHC) data analysis of the ATLAS experiment. Using di-muon Resonances we are able to calibrate to per-mil accuracy the detector response for muons. Innovative techniques developed throughout the Run-2 period and during the LHC shut-down significantly improve the measurement of muon reconstruction, identification and calibration performance with these preliminary data. New analysis techniques are exploited which involve multivariate analyses for rejecting background hadrons from prompt leptons from the hard interactions as well as innovative in-situ corrections on data that reduce biases in muon momenta induced from residual detector displacements. We measure the reconstruction efficiencies and momentum performance measured with these methods. The results achieved are fundamental for improving the reach of measurements and searches involving leptons, such as Higgs decays to dimuons and ZZ or the first low mass and high mass searches in the beyond-the-standard model sector. This talk will present the recently released results on the muon reconstruction performance using the Run-3 data collected in 2022 by the ATLAS detector.

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