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The ATLAS New Small Wheels for LHC Run3

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ATLAS, the largest particle detector at the Large Hadron Collider (LHC), had undergone a massive upgrade during the Long Shutdown 2, for proper operation under the high rates expected from High-Luminosity LHC (HL-LHC) era. Two New Small Wheels (NSW) have been constructed and installed, replacing the old SWs, at the most forward region of the ATLAS muon spectrometer and they are the first new detectors in the experiment specifically designed to handle High Luminosity. The NSW detectors are at the forefront of detector design, using two innovative gaseous detector technologies: Micromegas (MM) and small-strip thin-gap chambers (sTGC), and they provide both fast and precise muon-tracking capabilities.

This presentation will summarize the motivation of the NSW upgrade and the steps from the validation of the electronics for a system with more than 2.1 M electronic channels to the preliminary results for early detector operation and data-taking in 2022 for Run3 with the new Muons System.

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