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Muon Spectrometer Phase I Upgrade for the ATLAS Experiment: The New Small Wheels Project

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The instantaneous luminosity of the Large Hadron Collider at CERN will be increased up to a factor of five with respect to the design value. To maintain excellent detection and background rejection capability in the forward region of the ATLAS detector, part of the muon detection system will be upgraded during the LHC long shutdown period of 2019–2020, with the complete replacement of the present first station in the forward regions with the so-called New Small Wheels (NSWs). The NSWs will have a diameter of approximately 15 m and will be made of two detector technologies: Micromegas detectors and small-strip thin gap chambers (sTGC). The physics motivation for this significant upgrade to the ATLAS detector will be presented. The design choices made to address the physics needs will be discussed. Finally, the status of the ongoing detector modules production will be presented.

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