



Contribution ID: 410

Type: talk

## ATLAS Muon Spectrometer Upgrades for the High Luminosity LHC

*Friday 24 July 2015 09:15 (15 minutes)*

The luminosity of the LHC will increase up to  $2$  and  $7 \times 10^{34}$  cm<sup>-2</sup>s<sup>-1</sup> after long shutdowns in 2019 and 2025 (phase-1 and phase-2 upgrades). In order to cope with the increased particle fluxes, upgrades are envisioned for the ATLAS muon spectrometer. At phase-1, the current innermost stations of the ATLAS muon endcap will be upgraded with 2x4-layer modules of Micromegas detectors, sandwiched by 2x4-layer modules of small strip Thin Gap detectors. Each 4-layer module of the New Small Wheels covers a surface of approximately 2-3 m<sup>2</sup> for a total active area of 1200 m<sup>2</sup> each. On such large area detectors, the mechanical precision is a key point and must be controlled and monitored along the process of construction and integration. Extensive test-beam campaigns have been carried out on prototype detectors.

For phase-2, highly selective first level triggers are essential to exploit the full physics potential. The ATLAS experiment plans to increase the rate and latency of the first two trigger levels. This requires new muon trigger electronics and the replacement of the read-out electronics, which will allow for the inclusion of the precision chambers in the first level trigger. ATLAS plans to reinforce the barrel muon trigger system acceptance by the installation of additional thin resistive plate chambers with a high-rate capability.

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**Session Classification:** Detector R&D and Data Handling

**Track Classification:** Detector R&D and Data Handling