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## Upgrade of the ATLAS Muon Barrel Trigger for HL-LHC

The present ATLAS muon trigger in the barrel region ( $|\eta| < 1.05$ ) is based on three layers of RPC chambers. It was designed to run for 10 years at the LHC luminosity of  $10^{34} \text{ cm}^{-2} \text{ s}^{-1}$  and operated successfully and with high selectivity during the first run of the LHC. In order to ensure a stable performance of the RPCs until 2035 at the higher rates and at luminosities of  $5\text{--}7 \times 10^{34} \text{ cm}^{-2} \text{ s}^{-1}$  provided by HL-LHC, the chambers will have to be operated with reduced gas gain to respect the original design limits on currents and integrated charge. The ATLAS muon collaboration proposes an upgrade of the system by installing an inner layer of new generation RPCs during the LHC shutdown expected for the year 2023. This new layer will increase the system redundancy and therefore allow operation with high efficiency and high selectivity during the HL-LHC phase. The insertion of this new layer will also increase the geometrical acceptance in the barrel region from 75% to 95%. Moreover, the additional measurements along the muon track provided by the inner layer will improve the resolution on the muon momentum. The trigger electronics will be upgraded with a more flexible system capable to operate at the expected level-0 rate of 1 MHz. The first 10% of the system, corresponding to the edges of the inner barrel even sectors (BIS), has been already approved by ATLAS and will be installed in 2018, to reinforce the trigger in the region between barrel and endcap.

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