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BIS78, a pilot project for phase-2 ATLAS RPC and beyond

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The architecture of the present trigger system in the ATLAS muon barrel was designed according to a reference luminosity of 1034 cm-2 s-1 with a safety factor of 5, with respect to the simulated background rates, now confirmed by LHC Run 1 data. HL- LHC will provide a luminosity 5 times higher and an order of magnitude higher background. As a result, the performance demand increases, the detector being operated under condition much harsher than the design scenario.
ATLAS muon Collaboration approved an appropriate upgrade plan, to guarantee the performance required by the physics program for the 20 years scheduled, consisting in installing a layer of new generation RPCs in the inner barrel, to increase the redundancy, the selectivity, and provide almost full acceptance. The BIS78 project aims to install the first 10% of the system already in LS2, at the edges of the inner barrel even sectors (BIS7 and 8). This is the barrel region with the highest background so it is an excellent pilot project for the Phase-2 full coverage.
The BIS78 RPCs represent a new generation of the RPC detectors, basing on a new and advanced FE electronics capable to exploit 10 times smaller signals, correspondingly increasing the rate capability, and halved thickness gas gap and electrodes to reduce thickness, weight and to more than double the time resolution.
We will illustrate the performance of the new detectors and the project status.

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