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The Upgrade of the ATLAS Electron and Photon Triggers towards LHC Run 2 and their Performance

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Electron and photon triggers covering transverse energies from 5 GeV to several TeV are essential for signal selection in a wide variety of ATLAS physics analyses to study Standard Model processes and to search for new phenomena. Final states including leptons and photons had, for example, an important role in the discovery and measurement of the Higgs particle. Dedicated triggers are also used to collect data for calibration, efficiency and fake rate measurements. The ATLAS trigger system is divided in a hardware-based (Level 1) and a software based high level trigger (HLT), both of which were upgraded during the long shutdown of the LHC in preparation for data taking in 2015. The increasing luminosity and more challenging pile-up conditions as well as the planned higher center-of-mass energy demanded the optimisation of the trigger selections at each level, to control the rates and keep efficiencies high. To improve the performance multivariate analysis techniques are introduced at the HLT. The evolution of the ATLAS electron and photon triggers and their performance will be presented, including new results from the early days of the LHC Run 2 operation.

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