

Including radiation damage effects in ATLAS MonteCarlo simulations: status and perspectives

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Signal reduction is the most important radiation damage effect on performance of silicon tracking detectors in ATLAS. Adjusting sensor bias voltage and detection threshold can help in mitigating the effects but it is important to have simulated data that reproduce the evolution of performance with the accumulation of luminosity, hence fluence. ATLAS collaboration developed and implemented an algorithm that reproduces signal loss and changes in Lorentz angle due to radiation damage. This algorithm is now the default for Run3 simulated events. In this talk the algorithm will be briefly presented and results compared to first Run3 collision data. For the high-luminosity phase of LHC (HL-LHC) a faster algorithm is necessary since the increase of collision, event, track and hit rate imposes stringent constraints on the computing resources that can be allocated for this purpose. The philosophy of the new algorithm will be presented and the strategy on how to implement it and the needed ingredients will be discussed.

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