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Fast Lookup Tables for Parametrizing Charge Digitization in HL-LHC ATLAS ITk detectors

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The ATLAS ITk-Pixel and ITk-Strip detectors are planned tracker upgrades for the High-Luminosity LHC utilizing n+-in-p silicon sensors. They must withstand severe irradiation over their operational lifetimes, corresponding to fluences of up to 9×10^{15} 1-MeV neq/cm, with consequences on charge collection efficiencies. To achieve a precise understanding of the expected performance and to produce Monte Carlo simulations with realistic tracking performance, TCAD models of irradiation effects on internal electric fields are developed and coupled with AllPix2 simulations of ionization-charge propagation through the sensors. To bypass computational bottlenecks in simulating the busy HL-LHC environment, various fast Lookup Table strategies are explored and integrated into the AllPix2 ecosystem.

Will the talk be given in person or remotely?

Remotely

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