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Simulation of hybrid pixels using precise TCAD simulations

Tuesday 23 May 2023 10:00 (25 minutes)

In preparation for the High Luminosity LHC phase, the ATLAS collaboration is developing a new all-silicon tracking detector called the Inner Tracker (ITk). At the core of the new tracker will be 5 barrel layers equipped with hybrid pixel detectors with a fine pitch of either 50x50 or 25x100 μm. The new detector will need to withstand radiation damage levels up to 10 times greater than the current tracker, making it important to predict its performance after accumulating such a large radiation damage fluence. To do this, Allpix-squared will be used in combination with inputs from TCAD tools such as the electric field and weighting potential. This contribution will present the first lookup tables for an irradiated 100-μm-thick n-on-p sensor for collected charge, charge deflection, and free path, based on Allpix-squared simulations prepared using TCAD files from Silvaco tools. The plan is to use these lookup tables to correct cluster shapes and charges of ATLAS MC pixel-simulated events.

Will the talk be given in person or remotely?

Remotely

Authors: NAKKALIL, Keerthi (APC,CNRS/IN2P3 and Université'de Paris); BOMBEN, Marco (APC & Université Paris Cité, Paris (FR))

Presenter: NAKKALIL, Keerthi (APC,CNRS/IN2P3 and Université'de Paris)

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