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Simulation of hybrid pixels using precise TCAD simulations

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In view of the High Luminosity LHC phase the ATLAS collaboration is preparing a new all silicon tracking detector - the Inner Tracker (ITk).
At the core of the new tracker there will be 5 barrel layers instrumented with hybrid pixel detectors with fine pitch (50x50 or 25x100 um).
The new detector will have to sustain radiation damage levels up to 10 times larger than the actual tracker.
It is important to make predictions on performance after such a large accumulated radiation damage fluence.
For this allpix-squared is used, in combination with inputs from TCAD tools, like the electric field and the weighting potential.

In this contribution we will show the possibility to read in TCAD files from Silvaco tools and some studies for 100 um thick n-on-p sensors.

The plan is to use these predictions to correct cluster shapes and charges of the ATLAS MC pixel simulated events.

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