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Transient and SPICE Simulations of silicon sensors in the 65nm CMOS imaging process

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The goal of the TANGERINE project is to develop the next generation of monolithic silicon pixel detectors using a 65 nm CMOS imaging process, which offers a higher logic density and overall lower power consumption compared to currently utilized feature sizes.

The Analogue Pixel Test Structure (APTS) are sensors designed and developed by ALICE with readout boards developed by CERN EP R&D using a 65 nm imaging process to study the capabilities of this technology.

A combination of Technology Computer-Aided Design (TCAD) and Monte Carlo (MC) simulations are used to understand how the detector design affects the signal development in these sensors. Allpix Squared utilizes the electric field and generic doping profiles obtained with TCAD simulations to simulate the contribution of the detector response. The output is then introduced into a SPICE (Simulation Program with Integrated Circuit Emphasis) software to reproduce the electronics response used as readout in the actual sensors, which can be later compared with data obtained during laboratory characterizations and test beams.

In this contribution, the setup, the output of the detector and electronics response, and preliminary timing results will be presented.

Will the talk be given in person or remotely?

Remotely

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