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## Simulation of Hexagonal Pixel Configurations in Monolithic Active Pixel Sensors

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One of the aspects of the DESY Tangerine Project involves developing monolithic active pixel sensors (MAPS), which have been produced using 65 nm CMOS imaging technology and small collection electrodes. As a result, accurate simulations have shown to be crucial in assessing and predicting sensor performance, resulting in enhanced performance designs.

A simulation strategy that uses Technology Computer-Aided Design (TCAD) can combine Monte Carlo simulation with electrostatic field simulations to achieve this kind of characterization. The conventional square/rectangular pixel arrangements offer convenient fabrication and readout electronics, along with well-established data processing and analysis methods. The presented study examines the possible advantages of using a hexagonal pixel grid configuration over square or rectangular pixel layouts.

Efficiency, cluster size, and spatial resolution are used to evaluate these different configurations, and the square and hexagonal pixel geometries are compared. Additionally, time-dependent detector behaviour in response to incident particles of hexagonal pixel is simulated by means of transient simulations in detectors. The investigations conducted in this work underscore the potential of the hexagonal pixel grid to enhance the performance of MAPS in high-energy physics experiments.

### Will the talk be given in person or remotely?

Remotely

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