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Production plans of the Enhanced Lateral Drift sensors

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Future experiments in particle physics need a few-micrometer position resolution in their tracker and vertex detectors. Instead of scaling down pitch sizes, the so-called enhanced lateral drift (ELAD) sensor concept seeks to improve the position resolution by increasing the lateral size of the charge distribution already during the drift in the sensor material. The ELAD sensor design has been optimised using SYNOPSIS TCAD tool. The geometry of the buried implants, their doping concentration and the position inside the sensor were optimised for different sensor thicknesses and different types of the substrate.

To estimate the position resolution of an ELAD sensor, test beam simulations using the AllPix2 software have been performed applying the realistic electric field profiles from the TCAD simulations. In the AllPix2 simulations, 2D and 3D electric fields have been used. Results of the geometry optimisation are shown realising an optimal charge sharing and hence position resolution.

A position resolution of a few micrometers is expected by using buried implants without relying on a Lorentz drift or tilted incident angle. The production plans and future ELAD sensors applications are presented.

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