

Design of next-generation LGADs with TCAD tools

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As the ECFA detector research and development roadmap outlines, "revolutionary improvements in the performance of solid-state detectors are essential to meet the requirements of future experiments." In this context, Technology Computer-Aided Design (TCAD) is a highly valuable tool that can reduce costs and development time by providing a comprehensive understanding of the devices' physical behaviour before their manufacture. Ad-hoc developed numerical models for bulk and surface radiation damage effects can enhance TCAD tools, enabling the prediction of detector response evolution after irradiation and allowing designers to integrate this knowledge during the design phase.

This contribution will present the simulation outcomes that guided the design and predictive optimisation of the next-generation Low-Gain Avalanche Diodes (LGADs), such as Compensated LGADs and Resistive Silicon Detectors (RSDs).

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