

# Development of Simulation Software for Silicon Carbide Particle Detectors

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In the rapidly evolving field of semiconductor detector device design and performance prediction, computer-aided simulations play a crucial role. Various research institutions worldwide have developed simulation software and packages for semiconductor detectors, such as WeightField2, AllpixSquared, and TRACS, to address different software development requirements and computational performance demands. However, there is still a lack of dedicated software for simulating silicon carbide particle detectors.

This report introduces RASER, a Python-based fast semiconductor particle detector simulation software, jointly developed by the Institute of High Energy Physics and Jilin University, among others. The report presents the basic framework of RASER and highlights a comparative analysis between simulation results obtained from RASER and experimental measurements. Furthermore, the report discusses the guiding value of optimized device parameters derived from RASER simulations for the design of silicon carbide microstrip and pixel detectors.

By leveraging the capabilities of RASER, researchers and engineers can gain valuable insights into the design and optimization of silicon carbide particle detectors, contributing to the advancement of semiconductor detector technologies.

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