

DC-coupled resistive silicon detectors for 4-D tracking

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In this work, we introduce a new design concept: the DC-Coupled Resistive Silicon Detectors, based on the LGAD technology. This new approach intends to address a few known features of the first generation of AC-Coupled Resistive Silicon Detectors (RSD). Our simulation exploits a fast hybrid approach based on a combination of two packages, Weightfield2 and LTSpice. It demonstrates that the key features of the RSD design are maintained, yielding excellent timing and spatial resolutions: a few tens of ps and a few microns. In the presentation, we will outline the optimization methodology and the results of the simulation. We will present detailed studies on the effect of changing the ratio between the n+ resistivity and the low-resistivity ring, on the effect of noise, and on the achievable temporal and spatial resolution.

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