

## 3D simulation of electrical characteristics for detector of combining silicon biasing adaptor with silicon drift detector

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Silicon drift detector (SDD), which is the detector of low capacitance because of the small area's anode, has many novel characteristics and advantages within the small electronics noise, high energy resolution, fast response time, and good position resolution. Due to these properties, SDD has been widely used in the fields of aerospace, medical science and high energy physics experiments. By analyzing the traditional SDD properties, it has been found that the power consumption of the SDD array was enormous, and that the suitable resistors as dividers could not be found easily in one's stockroom. To solve these problems, we came up with combining the silicon biasing adaptor (SBA) with the silicon drift detector (SDD). The combining detector structure is simulated using a 3D Silvaco TCAD tool. It has been found in simulations that both leakage current and the voltage to reach the geometry capacitance (full depletion voltage,  $V_{fd}$ ) increase with radiation fluence. Compared with the conventional SDD, the SBA-SDD has the better electrical characteristics.

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