

Improving spatial resolution of radiation-tolerant pixel sensors

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We present a general concept to improve the spatial resolution of silicon pixel detectors via introducing position dependent inter-pixel cross-talk. By segmenting the readout implantations and AC-coupling the resulting sub-pixels, a part of the pixel charge is shared with neighboring pixels. Simulations to study the impact of different coupling capacitor values on spatial resolution are depicted and the feasibility of such design using a radiation-tolerant high-voltage CMOS technology is discussed. An improvement of the spatial resolution by about 40% for $50\mu\text{m} \times 50\mu\text{m}$ pixels is demonstrated.

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