

Investigation of non gaussian noise in irradiated p-on-n sensors

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In the CMS campaign to find the new baseline material for the next tracker, irradiated p-on-n sensors showed a non-gaussian noise behaviour. The effect has been quantified and studied systematically as a function of the applied bias voltage and sensor annealing, as well as irradiation fluence, particle type and energy and sensor geometry. In some operation area, this effect would lead to a noise occupancy of the sensor of over 10%, which makes this p-on-n sensors unuseful as a tracking device. The dependence on the sensor geometry (strip pitch and w/p ratio) indicates, that a high electric field at the strip side promotes the effect. T-CAD simulations of irradiated strip sensors showed an intrinsically higher electric field at the front side of p-on-n sensors compared to n-on-p sensors, thus making the occurrence of the effect more likely in p-on-n sensors.

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