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Edge-TCT characterization of irradiated HV-CMOSv3 sensors

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In high voltage monolithic detectors built on HV-CMOS technology the, usually small, n-well collecting diode is replaced by a long and deep n-well built on a low resistivity p-type substrate. The extended deep n-well allows partial depletion of the lightly doped region lying underneath. Charge collection in the depleted region is by drift. Some other charge may also appear in the depleted region after diffusion from the undepleted bulk. Since charge is promptly collected by drift, it is expected that these detectors will be radiation harder than monolithic detectors where collection is by diffusion only. Edge-TCT measurements of unirradiated and neutron irradiated 1×10^{15}, 7×10^{15} and 2×10^{16} n_{eq}/cm^2 samples were conducted. They show a charge collection degradation (preliminary) of $\approx$10% for 7×10^{15} and 50% for 2×10^{16} n_{eq}/cm^2 (reference measured at room T, irradiated measured at 0°C).

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