

Edge-TCT characterization of irradiated HV-CMOSv3 sensors

Thursday 20 November 2014 09:20 (20 minutes)

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 $0^\circ C$).

Authors: WEISSER, Constantin (CERN); MUENSTERMANN, Daniel (Universite de Geneve (CH)); FERNANDEZ GARCIA, Marcos (Universidad de Cantabria (ES))

Co-authors: GALLRAPP, Christian (CERN); NEUGEBAUER, Hannes (Hamburg University (DE)); MOLL, Michael (CERN)

Presenter: FERNANDEZ GARCIA, Marcos (Universidad de Cantabria (ES))

Session Classification: TCT techniques and HVCMOS