

An Introduction to Edge-TCT measurements on irradiated HV-CMOSv3 sensors

Thursday 20 November 2014 09:00 (20 minutes)

Passive $100 \times 100 \mu\text{m}$ test diodes in an unirradiated and an $1 \times 10^{15} \text{ Neq cm}^{-2}$ irradiated HV2FEI4v3 HV-CMOS silicon sensor were analysed using the edge TCT technique. The observed signal had fast and slow contributions, that were interpreted as drift and diffusion. The former peaked in a region, that was interpreted as the depletion region, while the latter peaked further in the bulk material. Raising the bias voltage increased the depth of the former region, while pushing the latter region further into the bulk. The irradiated sample lost signal strength mainly in its slow part compared to the unirradiated sample, while its quick signal remained largely unaffected. As only the signal interpreted as drift is fast enough to be useful in LHC operation the investigated sensors could be considered radiation hard for this purpose. This gives further promise to the HV CMOS technology for high energy physics applications.

Primary authors: WEISSER, Constantin (University of Manchester (GB)); 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: WEISSER, Constantin (University of Manchester (GB))

Session Classification: TCT techniques and HVCMOS