



Institut
Ruđer
Bošković



Contribution ID: 9

Type: **not specified**

Irradiation of gate-controlled diodes and MOS capacitors with ^{60}Co -gamma photons

Wednesday 18 November 2020 15:30 (20 minutes)

During the era of the High-Luminosity (HL) LHC the experimental devices will be subjected to enhanced radiation levels with fluxes of neutrons and charged hadrons in the inner detectors up to $\sim 2.3 \times 10^{16} \text{ n}_{eq}/\text{cm}^2$ and total ionization doses up to $\sim 1.2 \text{ Grad}$. A systematic program of irradiation tests with neutrons and charged hadrons is being run by LHC collaborations in view of the upgrade of the experiment, in order to cope with the higher luminosity of HL-LHC and the associated increase in pile-up events and radiation fluxes. While most related studies focus on irradiation with neutrons, hadrons or X-rays, in this work, a complementary radiation study with gamma photons from a ^{60}Co source is presented. The doses are of the orders of tens of kGy. The irradiated test structures contain among others gate-controlled diodes (GCD). Surface and bulk components of the electric current can be separated through IV measurements on a GCD, and the interface recombination velocity and interface state density can be determined from the surface current. Here, the alterations in the GCD current components after irradiation are investigated. MOS capacitors are also located on the test structures and the CV measurements on them are compared with the output of a TCAD simulation. The devices under test are made of oxygen enriched float zone p-type silicon.

Primary author: ASENOV, Patrick (Nat. Cent. for Sci. Res. Demokritos (GR))

Co-authors: ASSIOURAS, Panagiotis (Nat. Cent. for Sci. Res. Demokritos (GR)); KAZAS, Ioannis (Nat. Cent. for Sci. Res. Demokritos (GR)); Dr KYRIAKIS, Aristoteles (Nat. Cent. for Sci. Res. Demokritos (GR)); LOUKAS, Dimitrios (Nat. Cent. for Sci. Res. Demokritos (GR))

Presenter: ASENOV, Patrick (Nat. Cent. for Sci. Res. Demokritos (GR))

Session Classification: Detector Characterization and Simulation