Contribution ID: **129** Type: **Poster**

Study of p-type silicon GCD and FET structures irradiated with a 60 Co gamma source at HL-LHC radiation levels and TCAD simulations

Tuesday, 24 May 2022 08:42 (1 minute)

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 outer tracker detectors (200mm - 1200mm from the beam axis) from $3x10^{14}$ to $1x10^{15}$ neq/cm^2 and total ionization doses from 10 kGy to 750 kGy after 3000 fb^{-1} of irradiation. A systematic program of radiation 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. In this work, complementary radiation studies with gamma photons from a 60Co source are presented. The doses are of the orders of tens of kGy. The irradiated test structures contain among others gate-controlled diodes (GCD) and field-effect transistors (FET). The alterations in the current components after irradiation are investigated. The results of IV measurements on these devices are presented as a function of the total absorbed radiation dose following a specific annealing protocol. The measurements are compared with the results of a TCAD simulation. The devices under test are made of oxygen enriched float zone p-type silicon.

Collaboration

Primary author: ASSIOURAS, Panagiotis (Nat. Cent. for Sci. Res. Demokritos (GR))

Co-authors: LOUKAS, Dimitrios (Institute of Nuclear and Particle Physics (INPP), NCSR Demokritos, Aghia Paraskevi); KYRIAKIS, Aristoteles (Institute of Nuclear and Particle Physics (INPP), NCSR Demokritos, Aghia Paraskevi); KAZAS, Ioannis (Institute of Nuclear and Particle Physics (INPP), NCSR Demokritos, Aghia Paraskevi)

Presenter: ASSIOURAS, Panagiotis (Nat. Cent. for Sci. Res. Demokritos (GR))

Session Classification: Solid State Detectors - Poster session