



Contribution ID: 21

Type: **not specified**

Investigation of high resistivity p-type FZ silicon diodes after ^{60}Co - gamma irradiation

Tuesday, 21 June 2022 11:00 (20 minutes)

In this work, the macroscopic (I-V, C-V) and microscopic (Thermally Stimulated Current(TSC) and Capacitance(TS-Cap)) measurements were used to investigate the properties of high resistivity p-type diodes irradiated with ^{60}Co gamma-rays with dose values of 10, 20, 100 and 200 Mrad. Two types of diodes are manufactured using p-stop and p-spray to isolate pad and guard ring, and both are FZ p-type materials. For macroscopic measurements, frequency-dependent C-V only appeared on p-stop diodes and presented strongly dose-dependence; The development of leakage current density (j_d) with dose value was investigated. Compared to standard FZ n-type diodes, the exponential increase of j_d with dose didn't appear. In the microscopic measurements, the development of irradiation-induced defects concentration (BiOi, CiOi, VO, I) with dose is observed. And one unexpected larger peak appeared at the temperature range 80~130 K for 200 Mrad irradiated diodes. The above results were compared with data from TSC and Deep-Level Transient (DLTS) spectroscopy measurements achieved by the team of the CERN-RD50 "Acceptor removal project".

Primary authors: HIMMERLICH, Anja (CERN); Mr LIAO, Chuan (Hamburg University (DE)); FRETWURST, Eckhart (Hamburg University (DE)); GARUTTI, Erika (Hamburg University (DE)); PINTILIE, Ioana; SCHWANDT, Joern (Hamburg University (DE)); MAKARENKO, Leonid (Byelorussian State University (BY)); MOLL, Michael (CERN); GURIMSKAYA, Yana (Universite de Geneve (CH))

Presenter: Mr LIAO, Chuan (Hamburg University (DE))

Session Classification: Defect and Material Characterization