

Current generation in heavily irradiated Si detectors: mechanisms of the current saturation at HL-LHC fluences

Tuesday 21 November 2017 14:40 (20 minutes)

The impact of the active base with a low electric field on the bulk current in Si detectors irradiated to $F \geq 1 \times 10^{15}$ neq/cm², i.e. to fluences of interest for the experiments at HL-LHC was studied. The simulated profiles of the electric field $E(x)$ and of the bulk current densities $j(x)$ showed that active base gives different contribution to the detector current operating as electrically neutral conductive base or electrically neutral depleted region, which depends on bias voltage and F . A comparison between the simulated and experimental j vs. F data at fluences up to $\sim 10^{17}$ neq/cm² showed both $j(F)$ dependences to be converted from linear to the square-root, which leads to saturation of the detector current associated with the impact of several mechanisms.

Authors: Dr VERBITSKAYA, Elena (Ioffe Institute); Dr FADEEVA, Nadezda (Ioffe Institute); Dr EREMIN, Vladimir (Ioffe Institute)

Presenter: Dr VERBITSKAYA, Elena (Ioffe Institute)

Session Classification: Device simulation