

Front-side biasing of n-in-p silicon strip detectors

Tuesday 5 June 2018 15:10 (20 minutes)

Front-side biasing is an alternative method to bias a silicon sensor. Instead of directly applying high voltage to the back-side, one can exploit the conductive properties of the edge region to bias a detector exclusively via top-side connections. This option can be beneficial for the detector design and might help to facilitate the assembly process of modules. The effective bias voltage is affected by the resistance of the edge region and the sensor current. The measurements of n-in-p sensors performed to qualify this concept have shown that the voltage drop emerging from this resistance is negligible before irradiation. After irradiation, however, the resistivity of the edge region increases with fluence and saturates in the region of 10^7 at a fluence of $1 \times 10^{15} n_{eq} cm^{-2}$. The measurements are complemented by TCAD simulations and interpretations of the observed effects.

Primary author: DIERLAMM, Alexander (KIT - Karlsruhe Institute of Technology (DE))

Co-authors: METZLER, Marius (KIT - Karlsruhe Institute of Technology (DE)); BERGAUER, Thomas (Austrian Academy of Sciences (AT)); BASELGA BACARDIT, Marta (KIT - Karlsruhe Institute of Technology (DE)); PREE, Elias (Austrian Academy of Sciences (AT)); DRAGICEVIC, Marko (HEPHY Vienna); KONIG, Axel

Presenter: DIERLAMM, Alexander (KIT - Karlsruhe Institute of Technology (DE))

Session Classification: Pixel and Strip Sensors