

# Power Dissipation Studies on n-in-n Pixel Sensors

*Friday 4 December 2015 12:10 (20 minutes)*

The innermost tracking detector of the ATLAS experiment consists of planar n-in-n pixel sensors. Also the newly installed insertable b-layer (IBL) consists of pixel sensors but with a revised design layout and an improved front-end electronics. The envisaged radiation dose in the run II data taking period of the innermost sensors will be a few  $10^{15} \text{ n}_{\text{eq}} \text{ cm}^{-2}$ . Irradiation doses well above  $10^{16} \text{ n}_{\text{eq}} \text{ cm}^{-2}$  are considered for innermost pixel detector layers in future collider and detector upgrades like the high luminosity LHC (HL-LHC).

This contribution presents the results of a systematic study of power dissipation, which has been performed on several n-in-n single chip sensors, irradiated to fluences up to  $2 \times 10^{16} \text{ n}_{\text{eq}} \text{ cm}^{-2}$  as well as on all main structures of a non-irradiated IBL prototype wafer. Measurement parameters include variations of sensor bias voltages, operation temperatures, bulk thicknesses and irradiation fluences.

**Primary authors:** GISEN, Andreas (Technische Universitaet Dortmund (DE)); KLINGENBERG, Reiner (Technische Universitaet Dortmund (DE))

**Presenter:** GISEN, Andreas (Technische Universitaet Dortmund (DE))

**Session Classification:** 3D and Pixel detectors