

# Investigation of highly irradiated n<sup>+</sup>-in-n planar ATLAS pixel sensors

*Wednesday 19 November 2014 14:15 (20 minutes)*

Several FE-I3 sized n<sup>+</sup>-in-n single chip sensors have been irradiated to fluences up to  $2 \cdot 10^{16} n_{eq}/cm^2$  which may possibly be reached in the inner ATLAS pixel layers in HL-LHC. To determine the scaling behaviour, the leakage current was measured depending on the voltage or on the temperature for individual sensors.

In addition to these measurements an FE-I3 n<sup>+</sup>-in-n single chip assembly irradiated to a fluence of  $2 \cdot 10^{16} n_{eq}/cm^2$  was annealed in small steps to an overall time of 700 \,min at 60 °C. The impact on the leakage current and the collected charge was characterized.

The results obtained from this two studies are presented.

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**Session Classification:** Segmented Sensors, Test Beams and Detector Systems