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Long Term Annealing Studies of irradiated ATLAS12 sensors

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P-type sensors have been selected as a base material for many future detectors due to the superior radiation hardness. The properties and performance of irradiated sensors has been intensively measured, but some aspects like the annealing behavior are still under evaluation.
In this contribution long term annealing studies at room temperature and 60℃ on ATLAS12 p-type mini strip sensors, irradiated up to a fluence of 3e14 $\frac{n_{eq}}{cm^2}$, will be presented. The charge collection, leakage current and effective doping concentration behavior have been interpreted with existing annealing models.
The effect of the annealing temperature has been evaluated in order to conclude some properties of the mechanisms behind the annealing of p-type silicon. The behavior of these sensors will also be compared to previous measurements with irradiated up to 2e15 $\frac{n_{eq}}{cm^2}$, in which charge multiplication was observed. The results presented in this work contribute to the evaluation of sensors which are candidates to be used within HL-LHC Upgrade.

Authors: DIEHL, Leena (Albert Ludwigs Universitaet Freiburg (DE)); MORI, Riccardo (Albert Ludwigs Universitaet Freiburg (DE)); HAUSER, Marc (Albert Ludwigs Universitaet Freiburg (DE)); PARZEFALL, Ulrich (Albert Ludwigs Universitaet Freiburg (DE)); WIIK-FUCHS, Liv (Albert Ludwigs Universitaet Freiburg (DE))

Presenter: DIEHL, Leena (Albert Ludwigs Universitaet Freiburg (DE))

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