

## Evaluation of KEK n-in-p planar pixel sensor structures for very high radiation environments with testbeam

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Various structures for n-in-p planar pixel sensors have been developed at KEK in order to cope with the huge particle fluence in the upcoming LHC upgrades.

Performances of the sensors with the different structures have been evaluated with testbeam.

The n-in-p devices were connected by bump-bonding to the ATLAS Pixel front-end chip (FE-I4A) and characterized before and after the irradiation to  $1 \times 10^{16}$  1 MeV equivalent neutrons per square centimeter ( $n_{eq}/\text{cm}^2$ ). Results of measurements with 120 GeV/c momentum pion beam at the CERN Super Proton Synchrotron (SPS) in September 2012 are presented.

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