

Results with p-type pixel sensors with different geometries for the HL-LHC

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Pixel detectors will be extensively used for the four innermost layers of the upgraded ATLAS experiment at the future High Luminosity LHC (HL-LHC) at CERN. The total area of pixel sensors will be over 5 m². The silicon sensors that will instrument the pixel volume will have to face several technology challenges. They will have to withstand doses up to 2×10^{16} neq cm⁻², to have a reduced inactive area at the edge of the sensors still being able to hold 1000V bias voltage and to be relatively low cost considering the large area to be covered. N-side readout on p-type bulk is the most promising technology for satisfying the various requirements. Several sensor types have been produced in the UK, conceived for various readout systems, for studying the properties of n-in-p and n-in-n sensors before and after irradiation with test beam and laboratory measurements. The status of these studies is here presented in term of charge collection efficiency and charge sharing performances.

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