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Pixel sensors with different pitch layouts for ATLAS Phase-II upgrade

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Different pitch layouts are considered for the pixel detector being designed for the ATLAS upgraded tracking system which will be operating at the High Luminosity LHC. The tracking performance in the Endcap pixel regions could benefit from pixel layouts which differ from the geometries used in the barrel region. Also, the performance in different barrel layers and eta regions could be optimized using different pixel sizes.

This presentation will report on the development and tests of pitch layouts which could be readout by the FE-I4 ASICs. The pixel geometries include 50x250 μm^2 , 25x500 μm^2 , 100x125 μm^2 , 125x167 μm^2 , 50x2000 μm^2 and 25x2000 μm^2 .

The sensors with geometries 50x250 μm^2 , 25x500 μm^2 and 100x125 μm^2 were irradiated and tested at the DESY testbeam. These and other testbeam results as well as results from characterization of these sensors in the laboratory will be presented.

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