

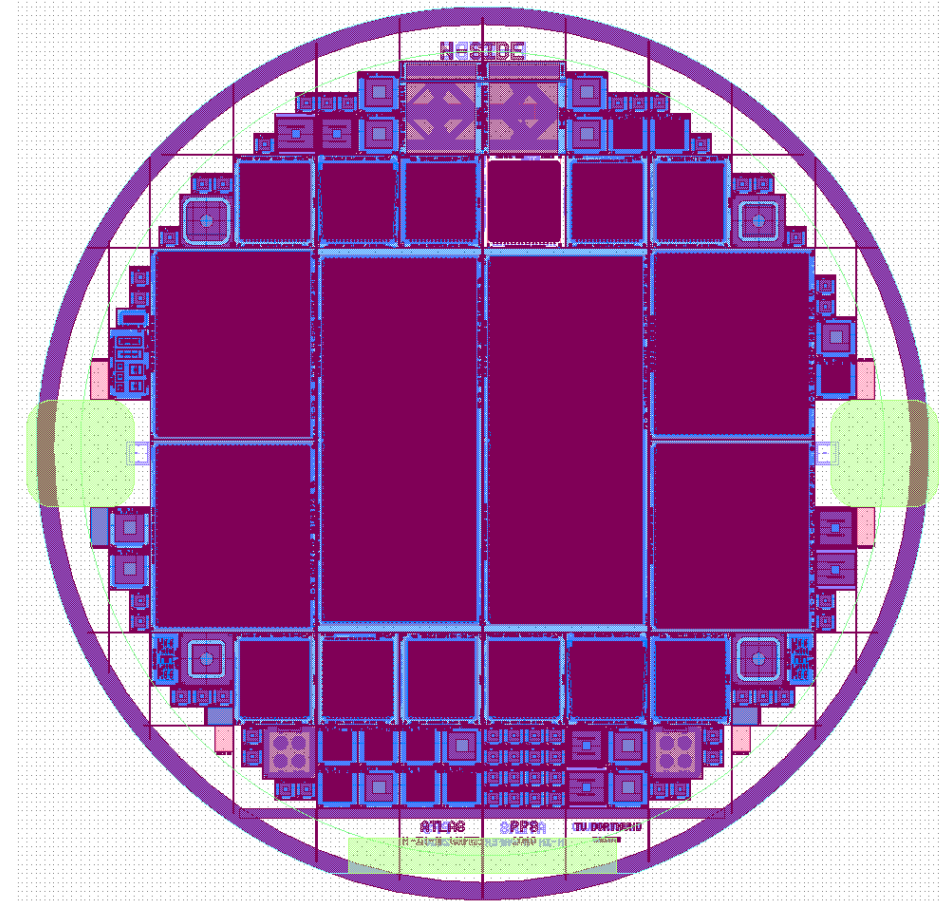
Outlook on the 2010 n-in-n CiS pixel production on thinned silicon

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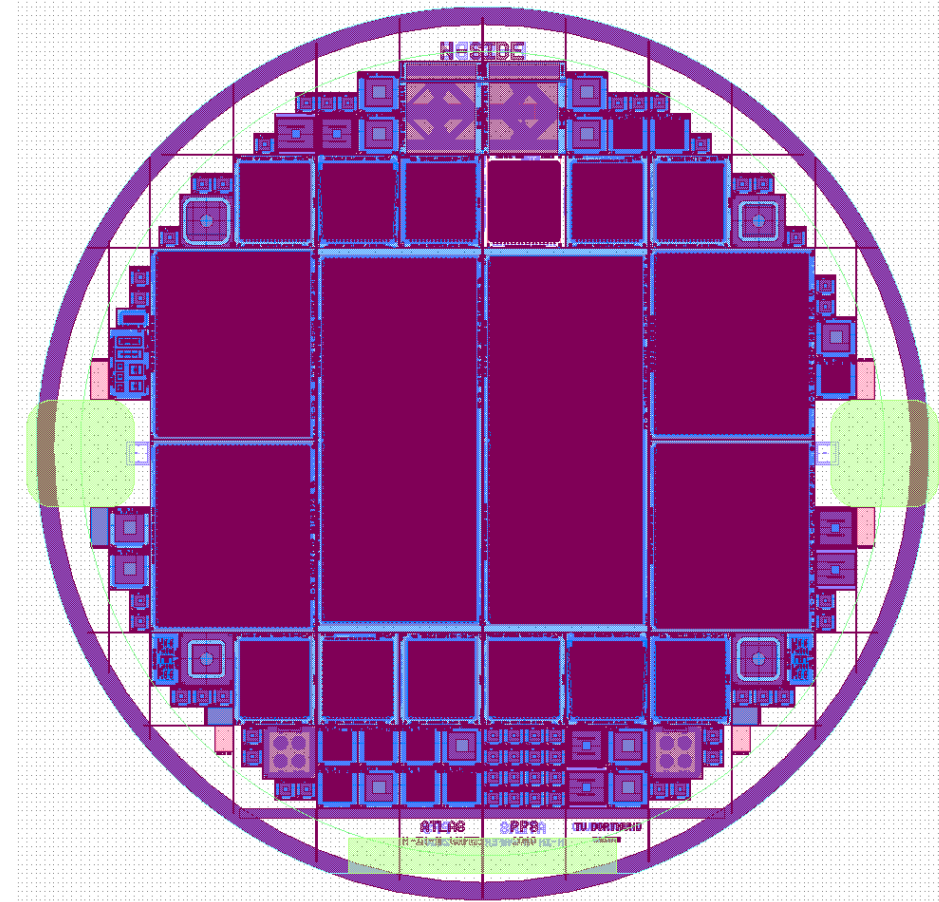
Overview

- Planar Pixel Sensor (PPS) submission to produce first planar n-in-n sensors compatible to the insertable b-layer (IBL)
- RD50 members already contributed structures and support



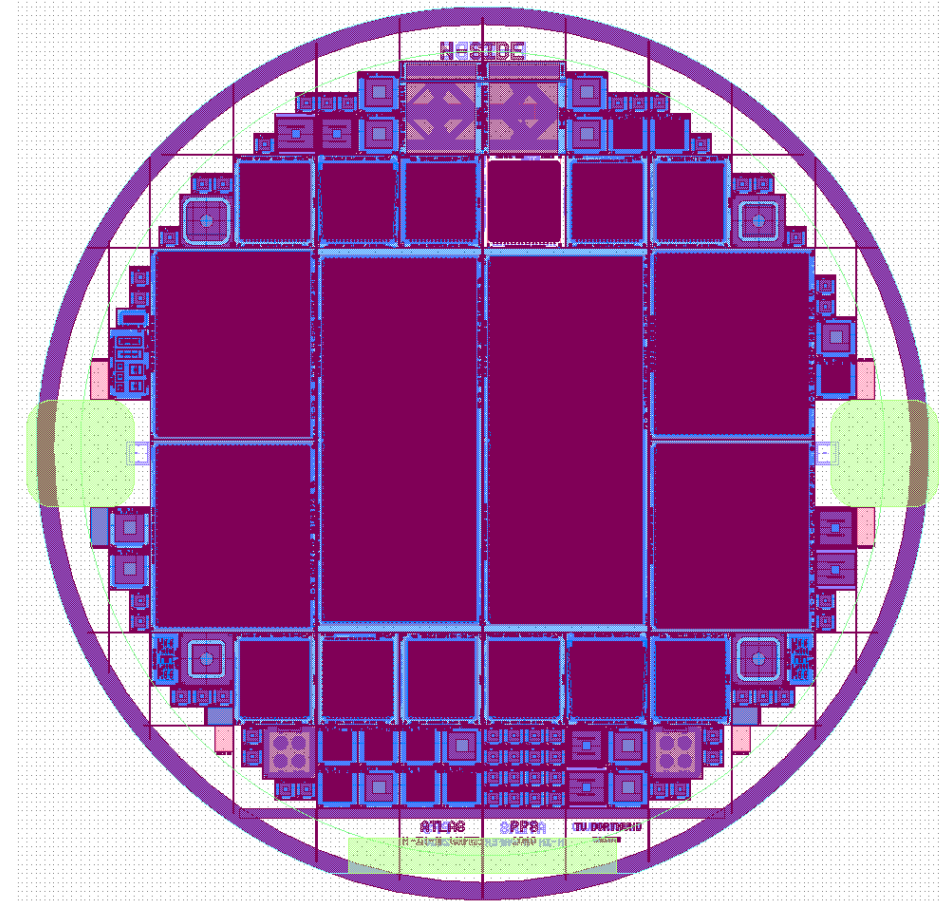
Overview

- vendor: CiS
- 4" n-type wafer (double sided)
- DOFZ bulk material
- Thicknesses:
 - 250µm (12 wafers)
 - 225µm (6 wafers)
 - 200µm (6 wafers)
 - 175µm (6 wafers)
 - 150µm (6 wafers)



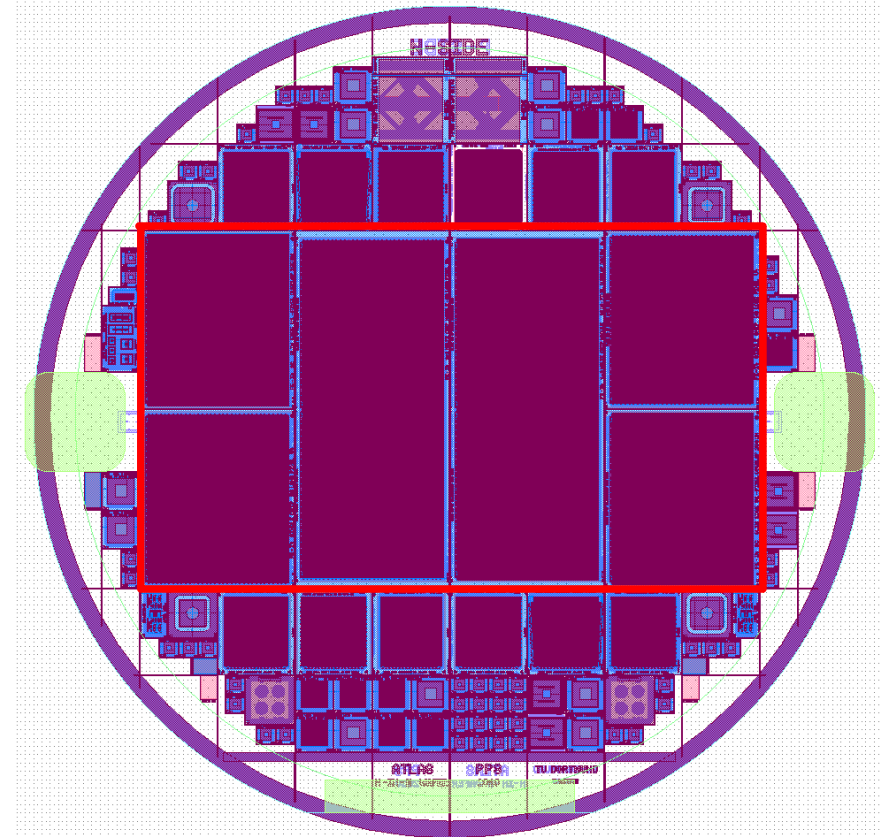
Overview

- Different kinds of structures
 - FE-I4 related sensors
 - FE-I3 related sensors
- test structures
 - guard ring diodes
 - ROSE diodes
 - GCD
 - Mosfets
 - sensors for test chips



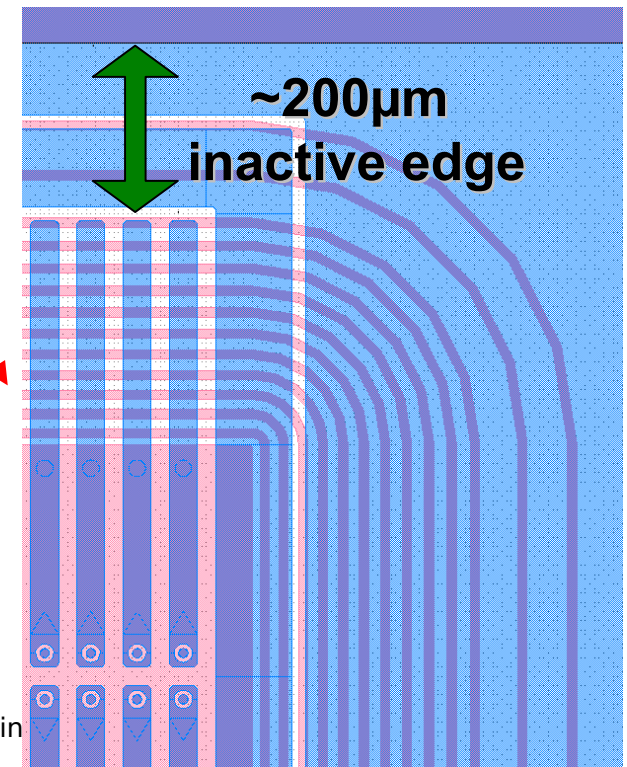
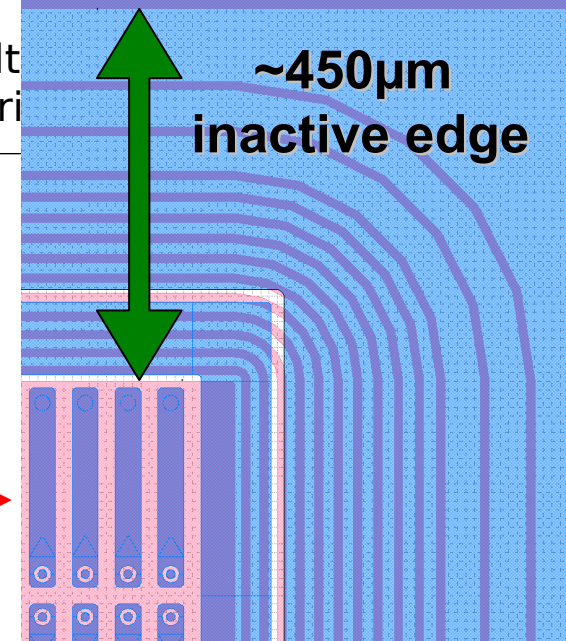
FE-I4 related sensors

- Two 2x1 MultiChipModules
- suitable sensor for the ATLAS insertable b-layer
 - reduction of the inactive edge is necessary ('Slim Edge')
 - conservative design
 - large inactive edge
 - no shifting of guard rings
 - no field inhomogeneities



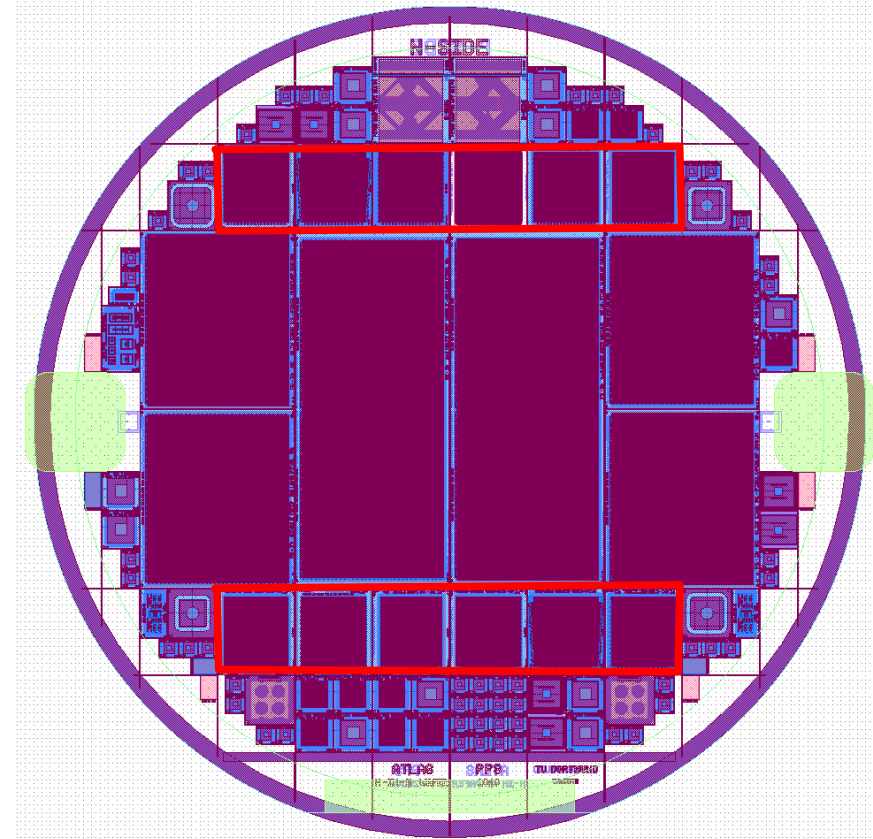
FE-I4 related sensors

- suitable sensor for the ATLAS insertable b-layer
 - slim edge design
 - shifted guard rings to minimize inactive edge
- Four SingleChip sensors
 - same two layouts as the MCMs



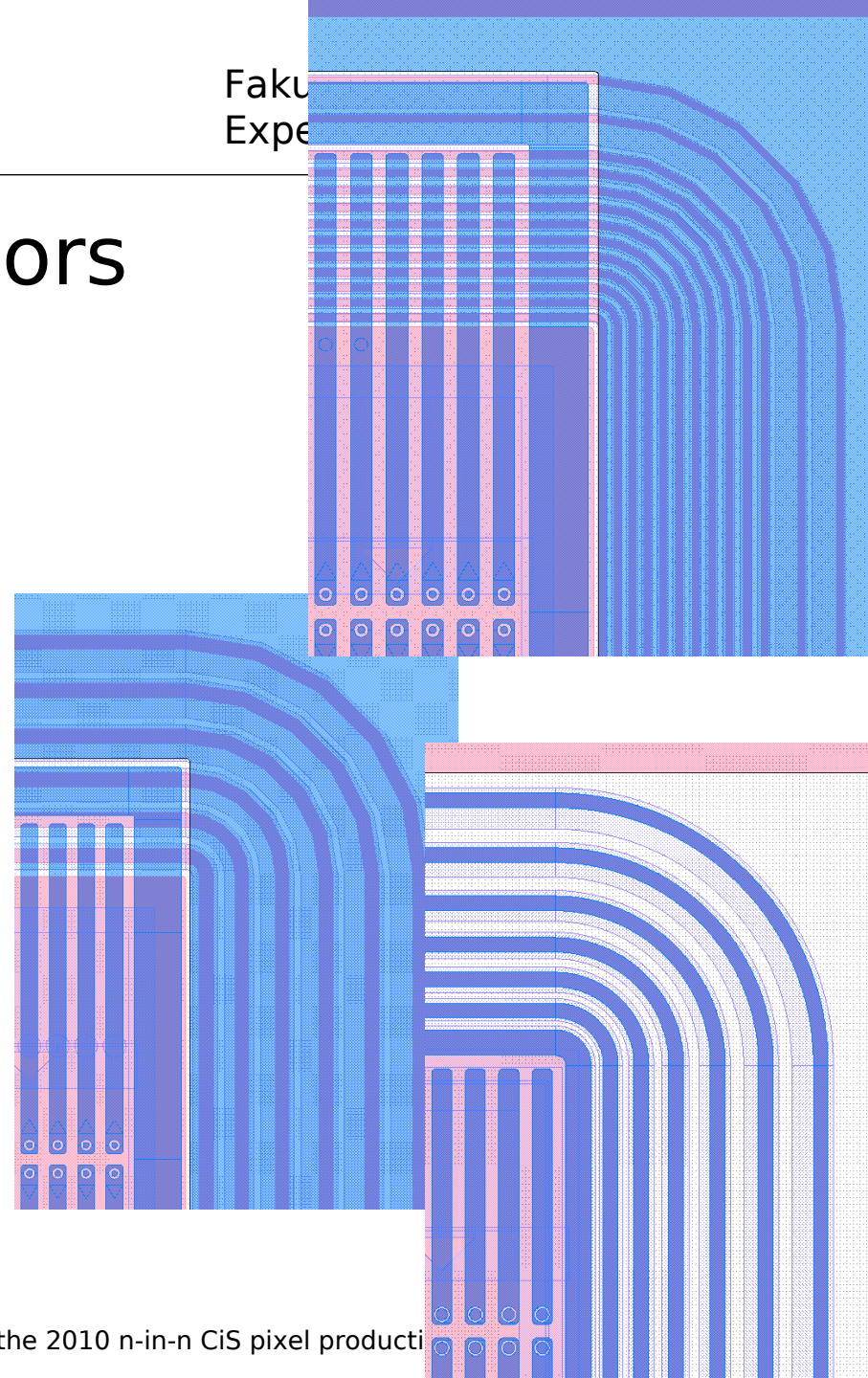
FE-I3 SingleChip sensoren

- Mainly different guard ring designs to investigate the reduction of inactive edges
 - same as the FE-I4 versions: for comparison
- new one which is promising according to device simulation
- guard rings on the p- and n-side
 - improved breakdown behaviour after bulk conversion?



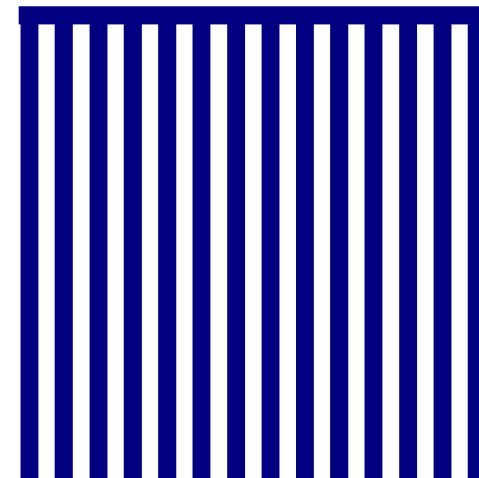
FE-I3 SingleChip sensors

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Diodes

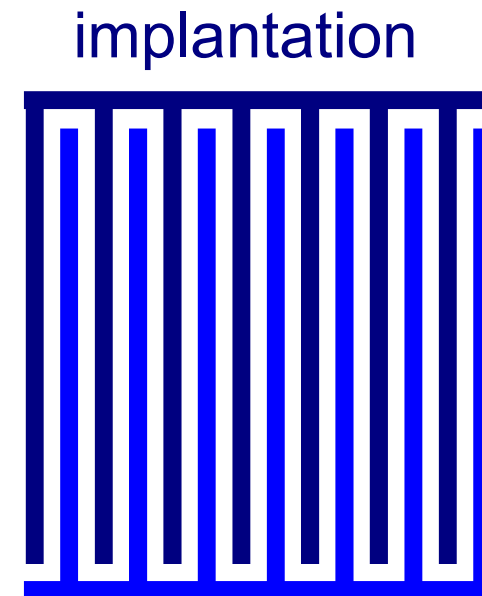
- Different versions to investigate charge amplification
- conventional pad like implantation for comparison
- comb like implantation
 - proposed by G.Kramberger
 - version with moderated p-spray between strips
- version with uniform p-spray between strips
- version with area-wide metal overhang
 - to have different field configurations



implantation

Diodes

- 'coplanar grid': two combs which intertwine
- possibility to apply a slightly different ground potential on the n-side to influence the field configuration



Irradiation plans (preliminary)

- Slim Edge structures
 - primarily necessary for IBL fluences ($2 \cdot 10^{15} n_{\text{eq}}/\text{cm}^2$ and $5 \cdot 10^{15} n_{\text{eq}}/\text{cm}^2$ neutrons)
- structures for charge amplification
 - fluences up to $20 \cdot 10^{15} n_{\text{eq}}/\text{cm}^2$ neutrons
 - comparison between the different bulk thicknesses will be one of the main issues
 - more collected charge in thinner sensors?