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MALTA monolithic Pixel sensors in TowerJazz 180 nm technology

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Depleted Monolithic Active Pixel Sensors are of highest interest at the HL-LHC and beyond for the replacement of the Pixel trackers in the innermost radii of HEP experiments where maximum performance, and cost effectiveness is required. They aim to provide high granularity and low material budget over large surfaces and ease of integration. This research includes the development of radiation hard DMAPS with small collection electrode in TowerJazz 180 nm CMOS imaging technology with asynchronous read-out (MALTA sensor), design and fabrication of prototypes, and characterization under high demanding conditions. The MALTA sensor features a pixel pitch of 36um and has been optimised for radiation hardness and best possible time resolution. The presentation will summarise the latest measurement results for sensor design and process optimisation towards radiation hardness of >2x10^15 n_eq/cm^2 (NIEL) and 100Mrad (TID). Spatial emphasis will be given to the optimisation of its time-resolution of 2ns in order to utilise the sensor for demanding time-tagging applications in a fine-pitch pixel tracker.

Collaboration

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