Contribution ID: **23** Type: **Talk (invited speaker only)**

[C03] Latest developments and results of radiation tolerance CMOS sensors with small collection electrodes

Wednesday 7 October 2020 21:00 (30 minutes)

The development of radiation hard Depleted Monolithic Active Pixel Sensors (DMAPS) targets the replacement of hybrid pixel detectors to meet radiation hardness requirements of at least 1.5E16 1 MeV neq/cm2 for the HL-LHC and beyond.

DMAPS were designed and tested in the TJ180nm TowerJazz CMOS imaging technology with small electrodes pixel designs. This technology reduces costs and provides granularity of 36.4x36.4µm2 with low power operation (1 uW / pixel), low noise of ENC<20e- , a small collection electrode (3 um) and fast signal response within 25 ns bunch crossing.

This contribution will present the latest developments after the MALTA and Mini-MALTA sensors. It will illustrate the improvements and results of the Czochralski substrate with a bigger depletion zone to improve efficiency. It will also present the plans for MALTA 2, which will be produced in late 2020, with enlarged transistors to reduce noise and cascoded front-end corrected slow control to improve chip operation.

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