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Performance and radiation hardness of Tower 180 nm MALTA monolithic pixel sensors

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The MALTA monolithic active pixel sensor produced in TowerJazz 180 nm CMOS technology with pixels of size 36.4 x 36.4 um² and a 3 micro;m² electrode. As part of the MALTA family, the MALTA2 demonstrator features an asynchronous readout with cascoded front-end and demonstrates time resolution below 2 ns with radiation hardness up to 3e15 n/cm². As such, the MALTA family is a compelling candidate for tracking detectors for the HL-LHC and beyond. This contribution will show results from irradiated MALTA2 produced on both high-resistivity epitaxial silicon and on Czochralski substrates, obtained during the 2022 testbeam campaign at CERN SPS North Area. The timing performance of MALTA2 sensor irradiated to 3e15 n/cm² will be presented along with the detector efficiency. Future chip designs will also be discussed.

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