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[F10] TimeSPOT results on sensors and electronics and future perspectives

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The TimeSPOT project has developed fast sensors and electronics for the readout of radiation-hard 4D pixels for vertex detectors of the next generation of experiments at colliders. In this paper, results about 3D silicon sensors, fabricated according to a so-called 3D-trench geometry, are illustrated. 3D-trench sensors have shown an intrinsic time resolution around 10 ps even after an integrated fluence of 2.5 10^16 1 MeV neutron equivalent per cm^2. Moreover, results from the test of a first read-out ASIC prototype, fabricated in CMOS 28-nm technology, are illustrated. The ASIC integrates a matrix of 32x32 pixels, 55 µm pitch. Each channel integrates one fast amplifier, one discriminator and one TDC. Measured time resolutions are in the range of 30ps. Next steps of dedicated developments on sensors and electronics, presently at their initial stage, will be also addressed in the paper.

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