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50 ps timing with SiGe Bi-CMOS monolithic pixel sensors

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The proof-of-concept of a monolithic silicon pixel detector in SiGe Bi-CMOS technology for outstanding tracking and timing performance was produced in the SG13G2 process of IHP Mikroelektronik. Measurements with a ^{90}Sr source show a time resolution of 50ps for hexagonal pixels of $130\mu\text{m}$ side. The performance of the front-end electronics is compatible with Cadence Spectre simulations and shows the potential of this technology to be used in future tracking detectors with precise 4D measurement capability.

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