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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 90Sr source show a time resolution of 50ps for hexagonal pixels of 130 μ m side. The performance of the frontend 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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