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Development of fast, monolithic silicon pixel sensors in a SiGe Bi-CMOS process.

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An ultra-fast, low-noise and low-power SiGe Bi-CMOS electronics was developed and implemented in a monolithic silicon pixel sensors, with the aim to achieve 100ps time resolution for minimum ionising particles with $500 \times 500 \mu\text{m}^2$ pixels, corresponding to $\sim 750\text{fF}$ capacity. The performance of a prototype chip, comprising a 3×10 pixel matrix and a 50ps binning TDC will be shown, together with the technique proposed to synchronise a large number of sensors at picosecond level.

Primary authors: IACOBUCCI, Giuseppe (Universite de Geneve (CH)); PAOLOZZI, Lorenzo (Universite de Geneve (CH)); RIPICCINI, Emanuele (UNIGE); VALERIO, Pierpaolo (CERN); HAYAKAWA, Daiki (Universite de Geneve (CH)); CARDARELLI, Roberto (INFN e Universita Roma Tor Vergata (IT)); Dr RÜCKER, Holger (IHP Microelectronics); Dr KAYNAK, Mehmet (IHP microelectronics)

Presenter: PAOLOZZI, Lorenzo (Universite de Geneve (CH))

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