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Silicon Sensor technologies for timing (LGAD)

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The working conditions at future accelerators will require the capability of taking data at unprecedented intensities and the possibility to distinguish events separated by a few tens of picoseconds will become of utmost importance. To face this challenge, intense R&D programs in silicon sensors are currently being carried on, with the ultimate goal of reaching concurrent excellent position and time resolutions. In this contribution I will review the status and the expectations on the production of fast silicon devices and I will point out the interplay of parameters such as internal gain, pixel volume and segmentation, electronic and shot noise in the design of the optimum sensor. Challenges related to the sensor manufacturing and the detector signal processing will be discussed, and first results from recently produced prototypes will be shown and compared to simulation.

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