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High resolution timing detectors and electronics: an overview

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In the last decade the interest towards radiation detectors combining good time resolution (100 ps rms or below) and high channel density has significantly increased. ASICs implemented in deep submicron CMOS technologies and latest generation FPGAs allow to confine the error introduced by the readout electronics to a few ps. The main challenges are thus expected to come from the sensor and/or system level issues. In the presentation the key factors limiting the detector time resolution are discussed, with emphasis on the interplay between the sensor and its front-end. Significant developments in the field of high-resolution, high-granularity timing systems are reviewed.

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