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Fast timing and 4D tracking with UFSD detectors

In this contribution, I will review the growing interest in implementing large area fast timing detectors with a time resolution of 30-50 ps based on low gain avalanche detectors. This interest is spurred as timing information is a very effective tool in pile-up rejection. Large scale high-precision timing detectors face formidable challenges in almost every aspect: sensors performance, their segmentation and radiation resistance, very low power and low noise electronics, cooling, low material budget and large data volume. In my talk I will also present the progress towards the realization of 4D-tracking detectors, which combine the excellent spatial resolution of silicon trackers to fast timing measurement. The current status of these developments in detectors for high-energy physics, and its possible use at HL-LHC, will be reported.

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