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Picosecond timing performances of the FERS-5200 readout system

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Next generation high energy physics experiments will feature high-granularity detectors with thousands of readout channels, thus requiring ASICs (low power and dimension).

CAEN FrontEnd Readout System (FERS) integrates ASICs on small, synchronizable and distributable systems with Front and Back Ends. The A5203 FERS houses the recently released CERN picoTDC ASIC and provides high-resolution time measurements of ToA and ToT.

In this talk we will analyze the performances of the A5203 unit: 3.125 ps LSB, ToA measurements down to ~ 7 ps RMS over a single board, and ~ 20 ps RMS for input signals of variable amplitude. The walk effect introduced by different amplitudes is corrected using ToT. Besides walk correction, the ToT is used for signal amplitude reconstruction and background reduction.

The A5203 has been used in various applications, both experimental and industrial. These will be quickly illustrated as well as the upcoming units where picoTDC will be combined with new Weeroc ASICs.

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Session Classification: Applied research and new ideas (part II)