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Readout Electronics on Waveform Digitization and High-precision Time Measurement

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Waveform digitization is the most direct and effective method for capturing comprehensive signal information from particle detectors. This approach enables physicists to extract critical parameters through flexible digital algorithms. In this report, we present our development of waveform digitization electronics utilizing the DRS4 ASIC and a custom-designed Switched Capacitor Array (SCA) ASIC, including circuit design and experimental validation. Furthermore, we address the escalating demand for high-precision timing in particle physics readout systems, where sub-10 ps RMS resolution is now essential. Waveform digitization provides a viable approach to achieve such precision and our detailed implementation of this technique for ultra-high-resolution time measurement is also presented.

Collaboration you are representing

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