

Abstract Submitted
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Fast Digital Signal Processing Using FPGAs for Nuclear Physics Experiments¹ JOHN WILSON, JASON FRY, Eastern Kentucky University — A field-programmable gate array (FPGA) possesses speed and performance comparable to a hardwired integrated circuit but packs a much higher versatility. FPGAs are becoming a realistic and useful replacement for analog signal processors because of their adaptability and capacity for complex filters. Though a fully functional computational device does not have the speed nor the delicacy to filter high throughput waveform data, FPGAs that do are increasingly available. Contemporary experiments in precise nuclear physics may benefit significantly from the sophisticated yet fast filters that can be executed on these systems. We are presently developing signal processing tools in a high-end FPGA to apply in nuclear particle detection. We will report on the progress of implementing impulse response filters on an advanced Xilinx RFSoc for use in such experiments.

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