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# Time determination method using digital waveform processing with RFSoC for RI beam experiments

We have developed a digital waveform processing system with Xilinx RFSoC.It is optimized system for experiments at RIKEN RI Beam Factory(RIBF) that is an accelerator facility in Japan. This system is aimed at simultaneous measurement of TOF with high-resolution and ΔE using plastic scintillators. For this development, Xilinx RFSoC that includes 4GHz FADC, FPGA, and CPU has been adopted. Using RFSoC, we expect to be able to establish the system processing high frequency signal without dead time. As for the development status, this system was introduced in RI beam experiments and measured ΔE and TOF with plastic scintillators. Also, as timing determination methods in waveform analysis, we have studied extrapolation of the rising slope, zero-cross timing, and centroid calculation. As the result, a high timing resolution was successfully obtained with centroid calculation. In this contribution, the developed system and the timing determination method will be reported in detail.

## Minioral

Yes

## IEEE Member

No

## Are you a student?

Yes

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