Waveform shaping by DSP

TechnoAP

Difference between Trapezoidal Filter and Semi Gauss Filter

Our **digital signal processor (DSP)** such as APV8016A processes the signal of **digital Trapezoidal Filter** by high-speed FPGA. The difference in pulse response of the conventional analog Semi Gauss Filter is shown.
The time to peak is about 1/2 and the pulse width is about 1/3 as short as the Gauss Filter. Comparing the energy resolutions using Ge semiconductor detectors, similar high resolutions can be obtained at low rates, and data can be obtained at higher rates with more resolution maintained than the Semi Gauss Filter. By performing digital Trapezoidal Filter processing, high counts and abundant data can be obtained, making it possible to perform various analyzes compared to the Semi Gauss Filter.

The Trapezoidal Filter allows the user to measure up to high counts while maintaining high resolution.

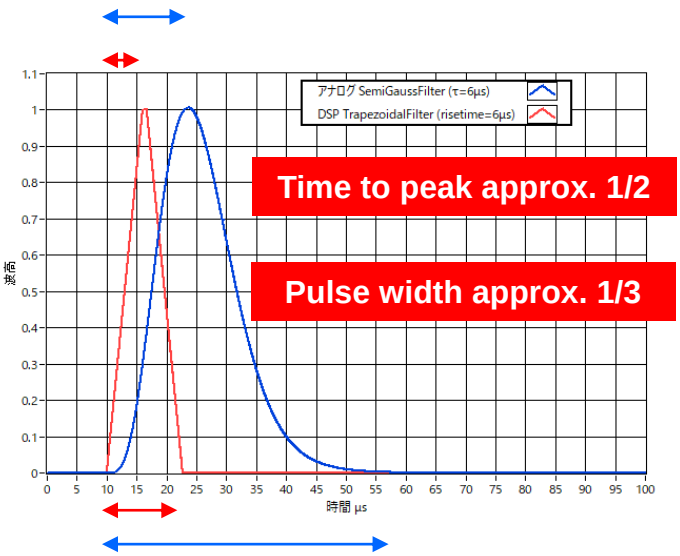

Figure 1.Difference in response between Trapezoidal Filter and Semi Gauss Filter

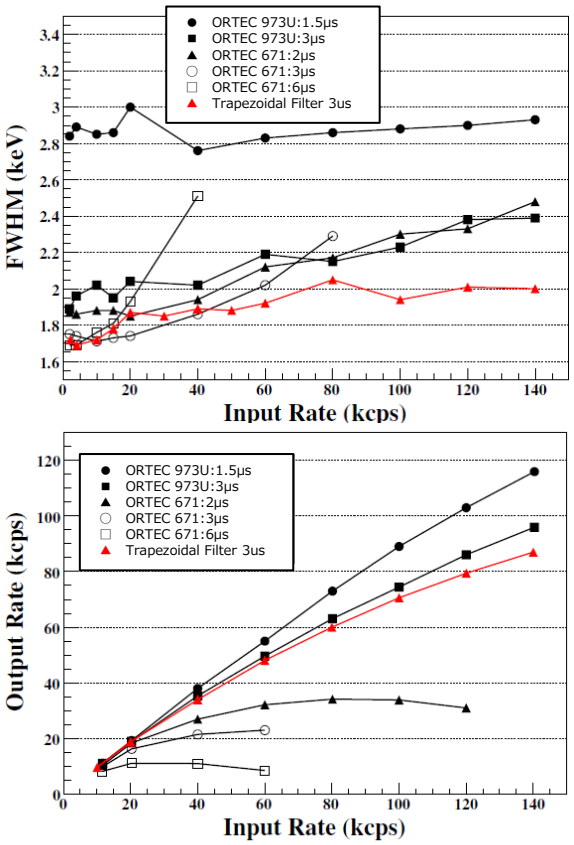

Figure 2. Difference in Ge energy resolution between Trapezoidal Filter and Semi Gauss Filter

	Digital Trapezoidal Filter	Analog Semi Gauss Filter
Resolution	◎	◎
Linearity	◎	◎
Counting rate	◎	△
Multi-channel	○	△
Cost	○	△
Data analysis	◎	△

Table 1. Performance comparison between Trapezoidal Filter method and Semi Gauss Filter method

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