HPGe test

Dec. 14. 2016. Thu.

Byul Moon

Status

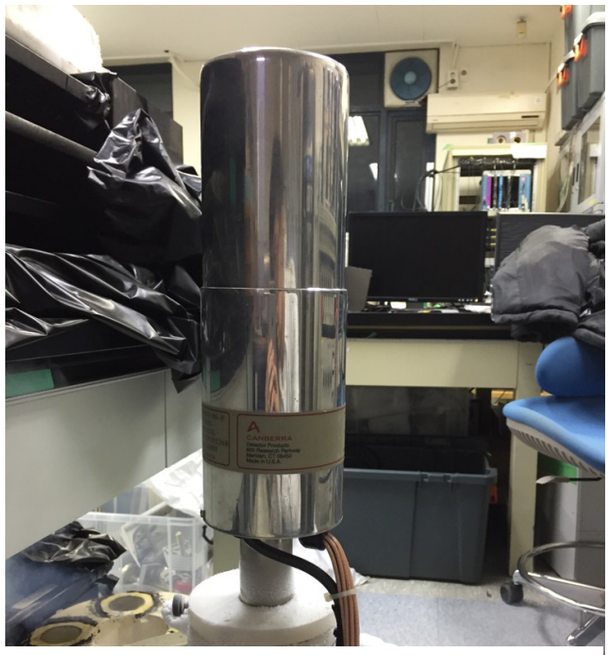
- Canberra GEM20180 Pop-top HPGe : Bad energy resolution, cracks in the crystal.

- Oxford HPGe : confirmed to be disused.

- Ortec GEM30185 Pop-top HPGe : in a test and waiting for the repair.

- Ortec GEM30185 Portable HPGe : in a test and waiting for the repair.

Status



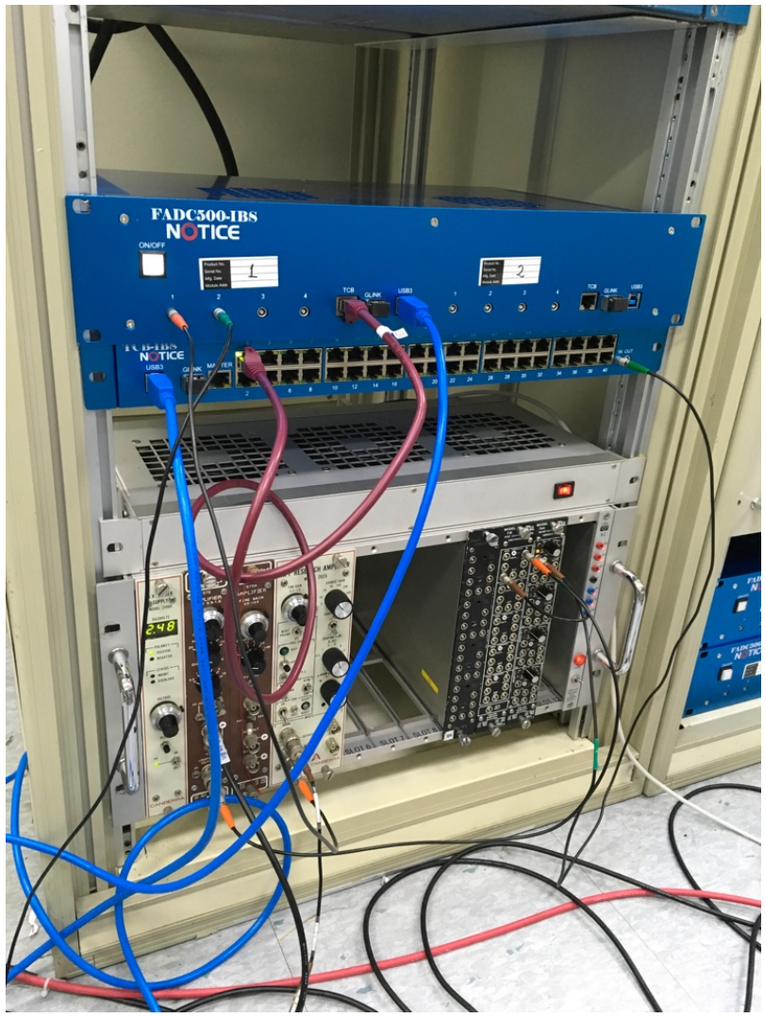
GEM20180 : in operation/test

GEM30185 : in a test

Oxford : disuse

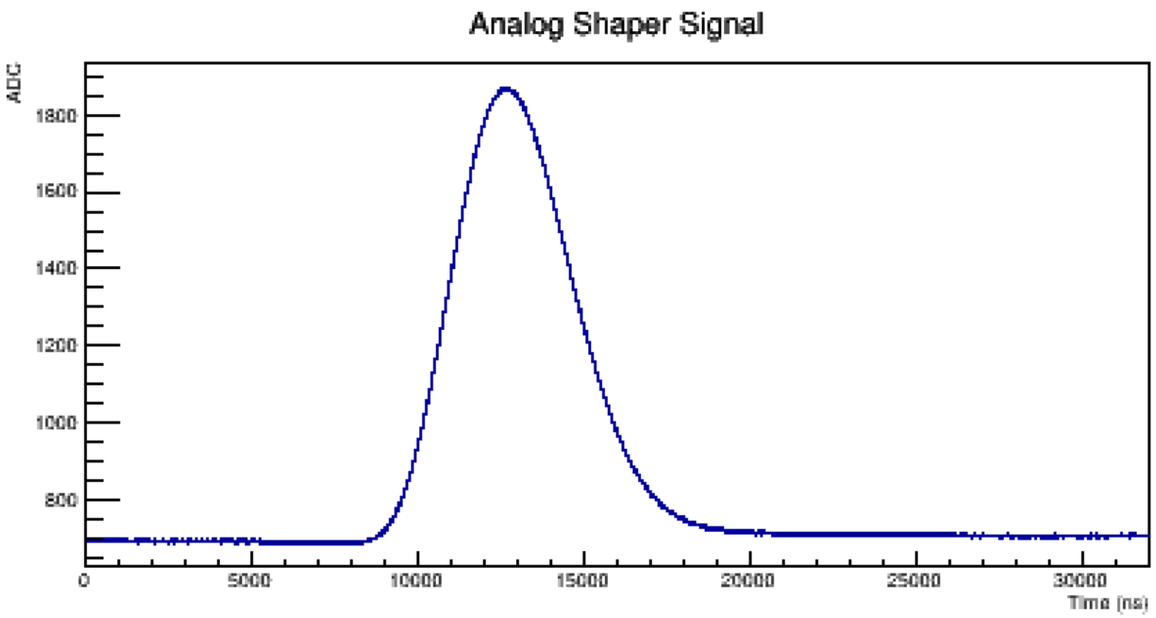
GEM30185 : in a test

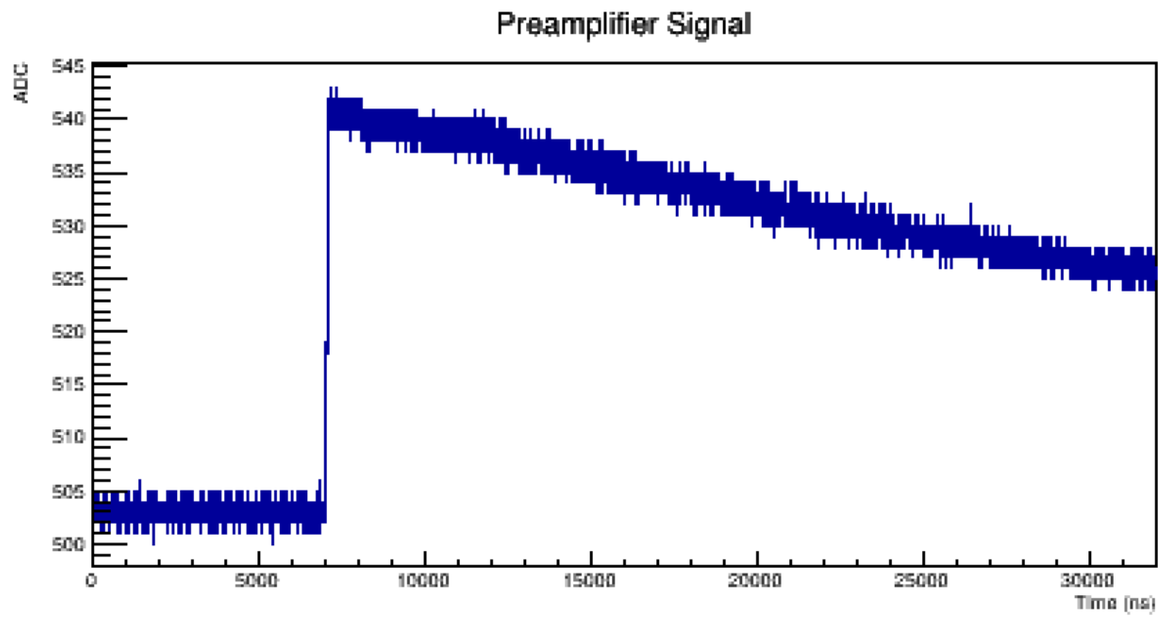
Operation Process

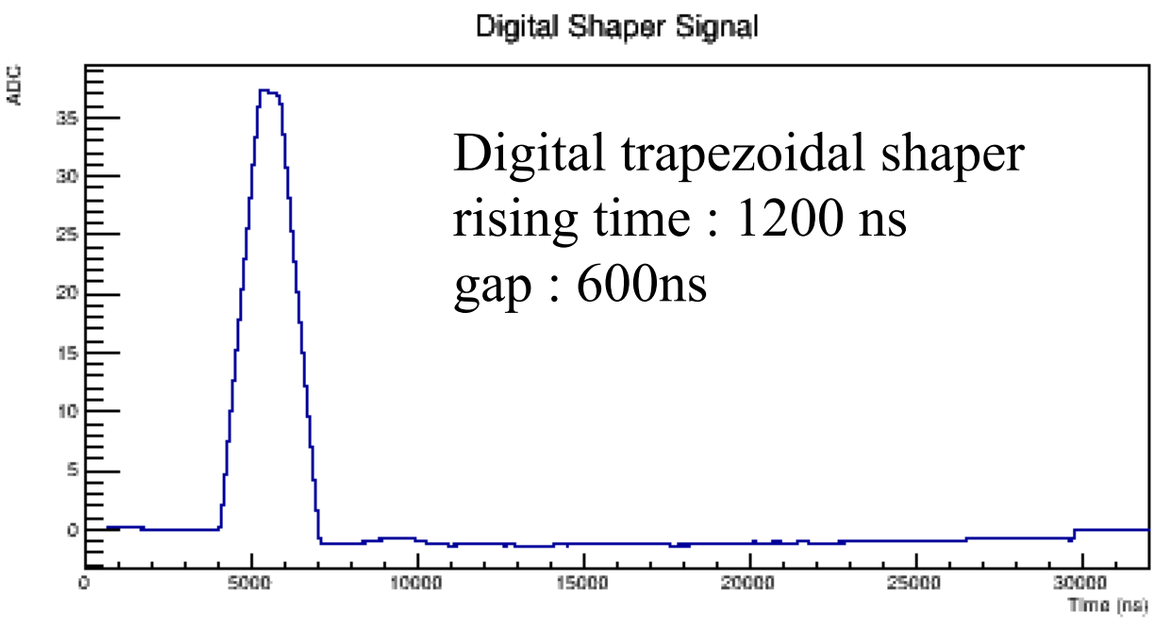


DAQ : FADC500
detector : Canberra GEM20180
bias : +2490V(+4000V is standard.)
trigger : external global trigger mode with the self triggering of HPGe
source : ^{60}Co, ^{152}Eu
ch1 : signal after an analog shaping amplifier(shaping time : 2μs)
ch2 : signal from a preamplifier

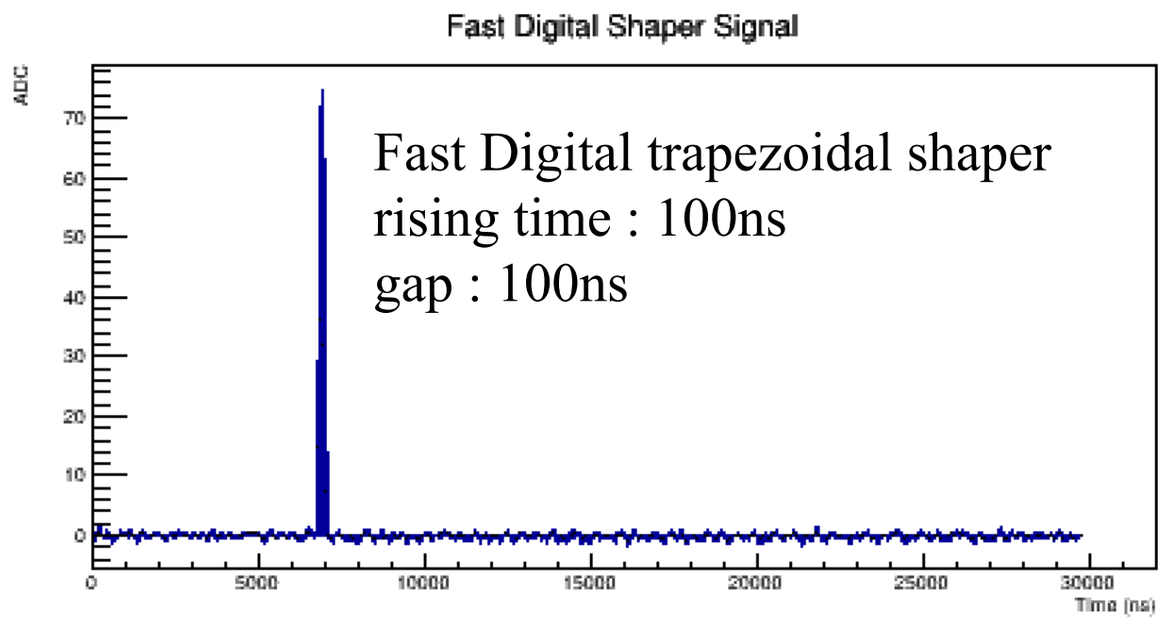
Simple Analysis





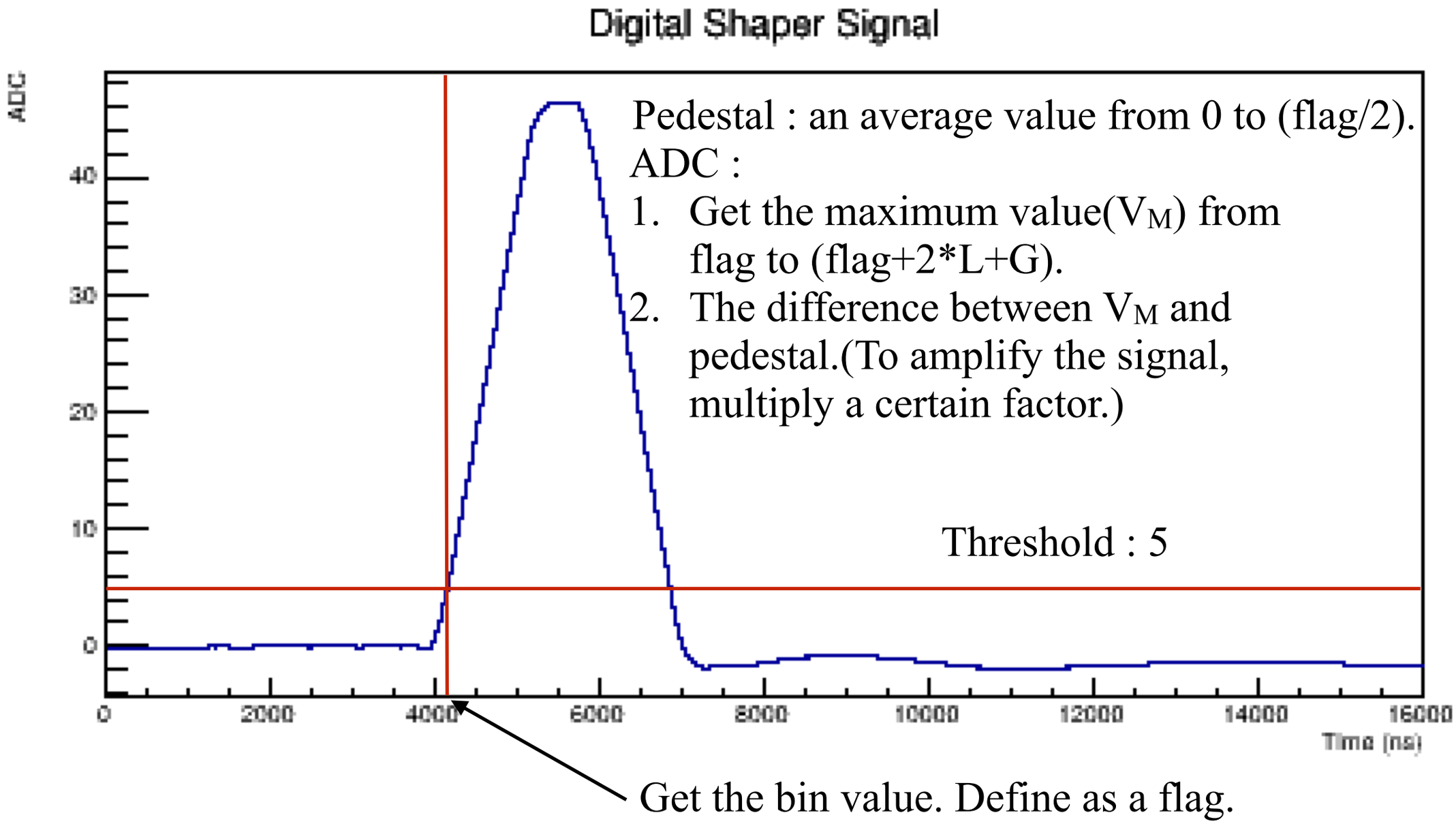


Digital trapezoidal shaper
rising time : 1200 ns
gap : 600ns

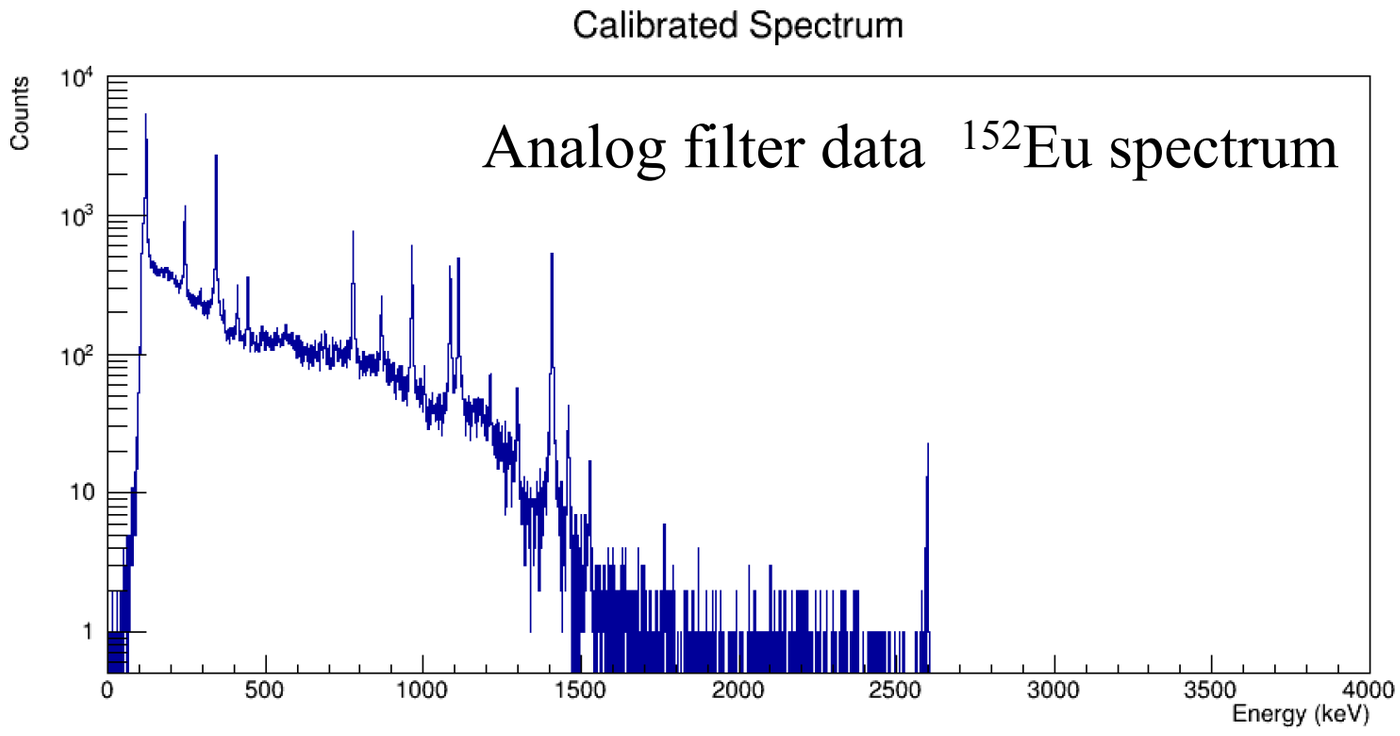


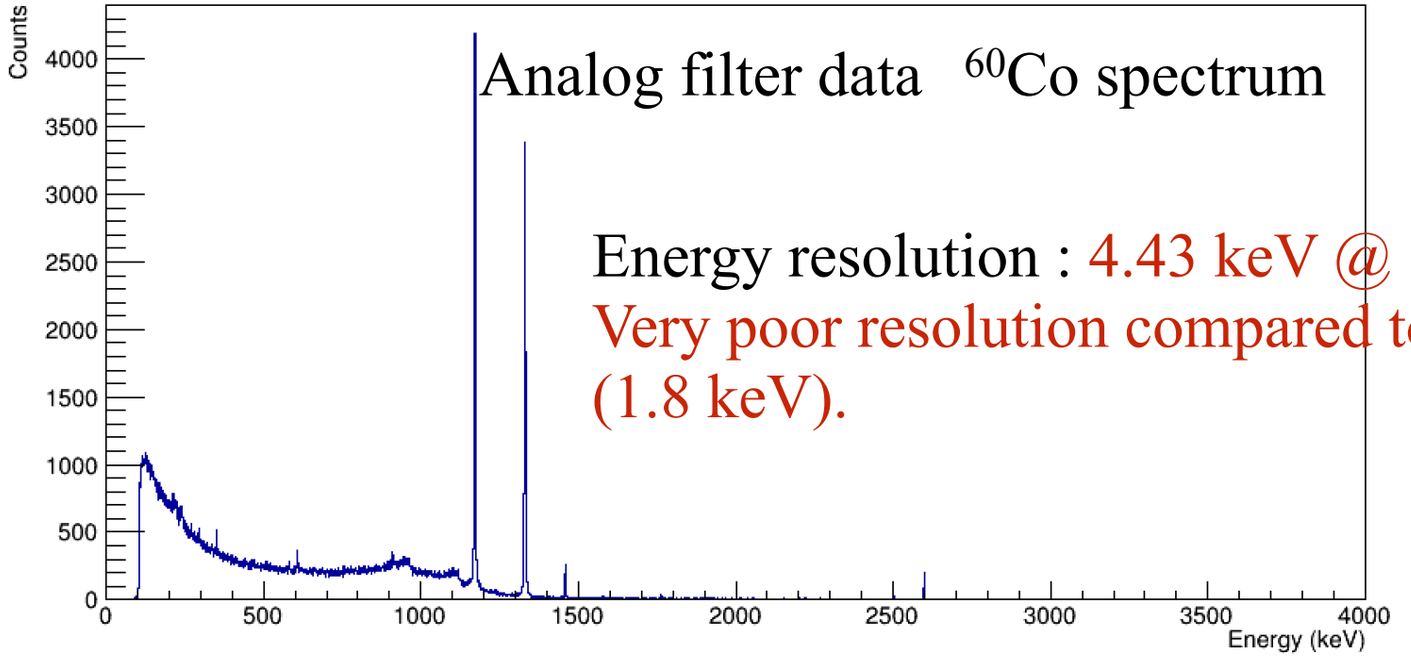
Fast Digital trapezoidal shaper
rising time : 100ns
gap : 100ns

Simple Analysis



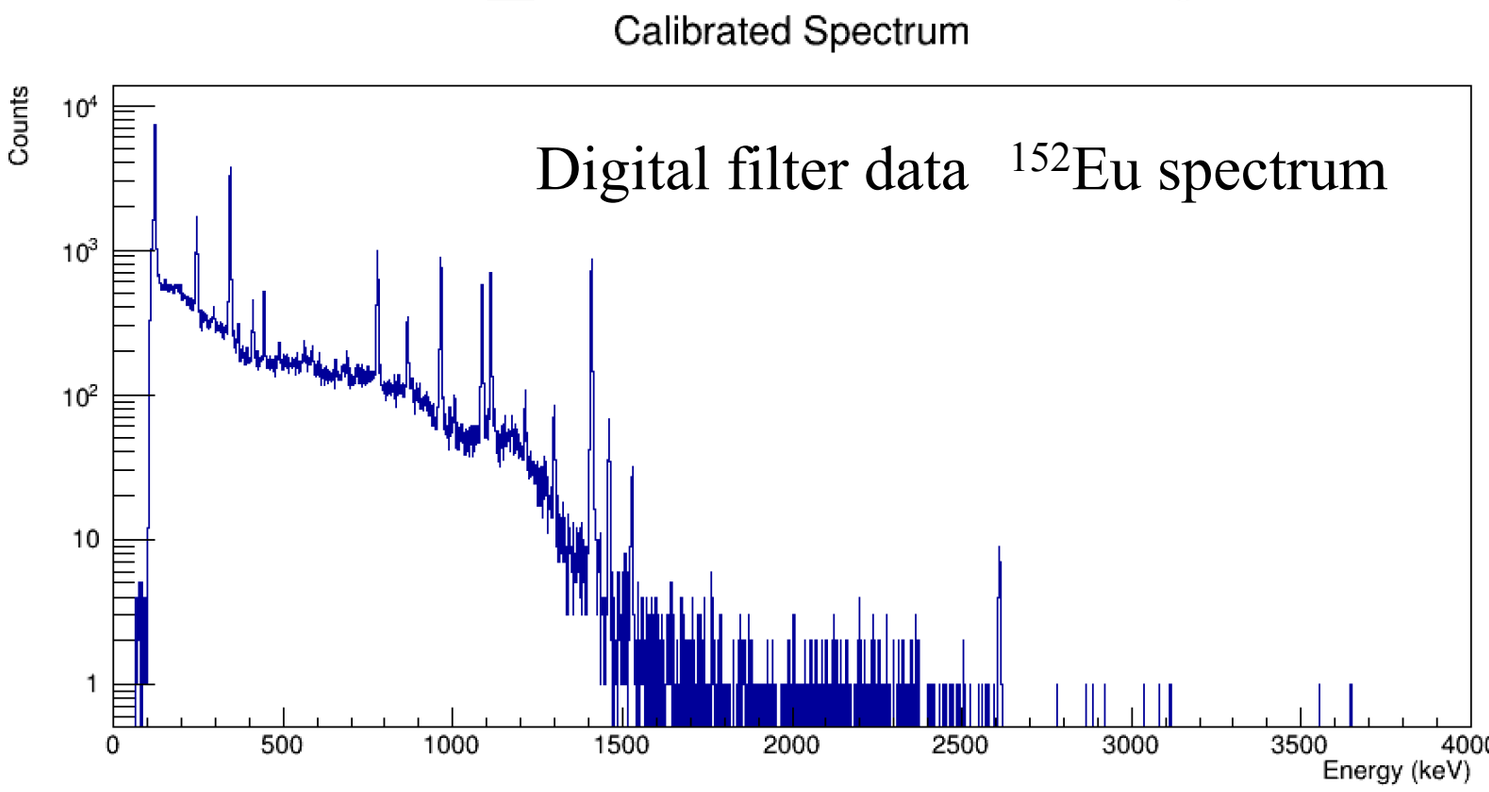
Simple Analysis

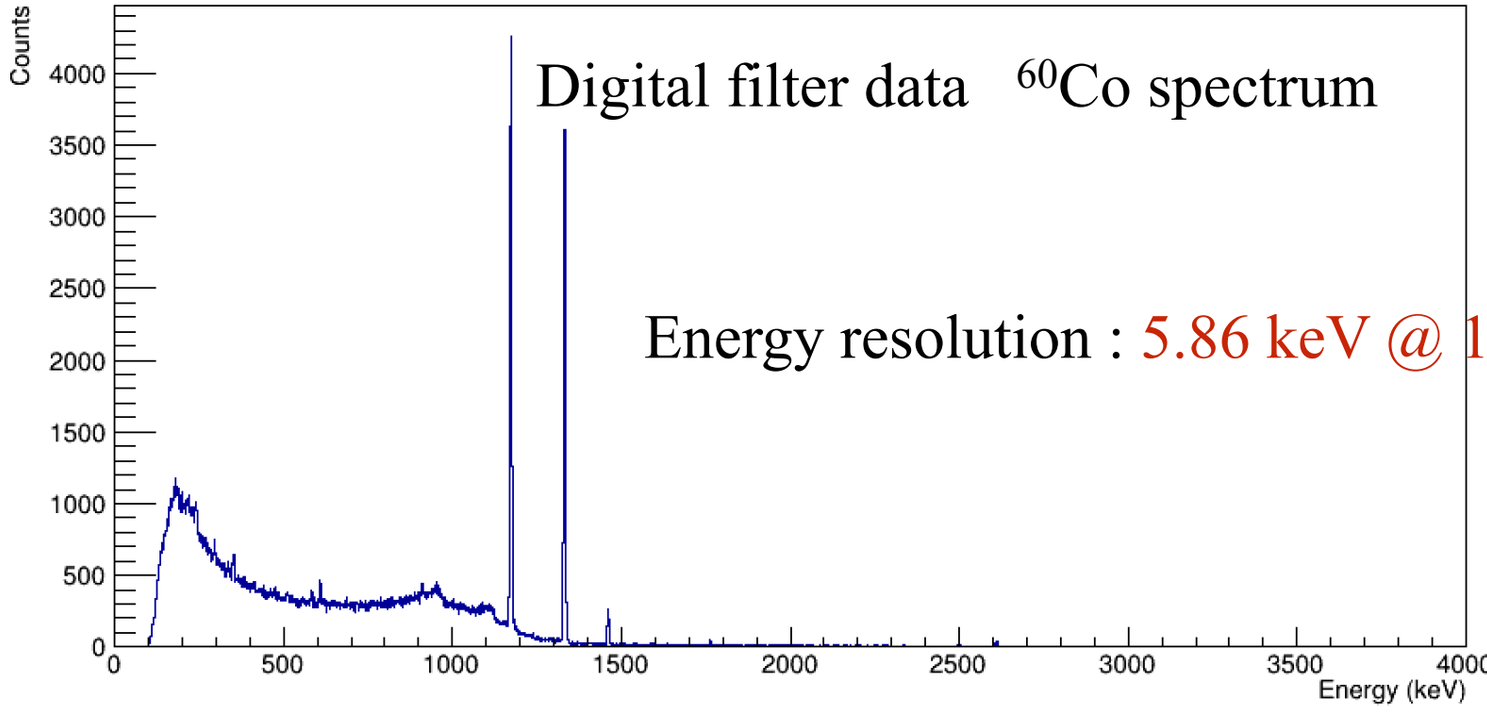




Energy resolution : 4.43 keV @ 1332.5 keV(~0.33 %)
Very poor resolution compared to the standard value (1.8 keV).

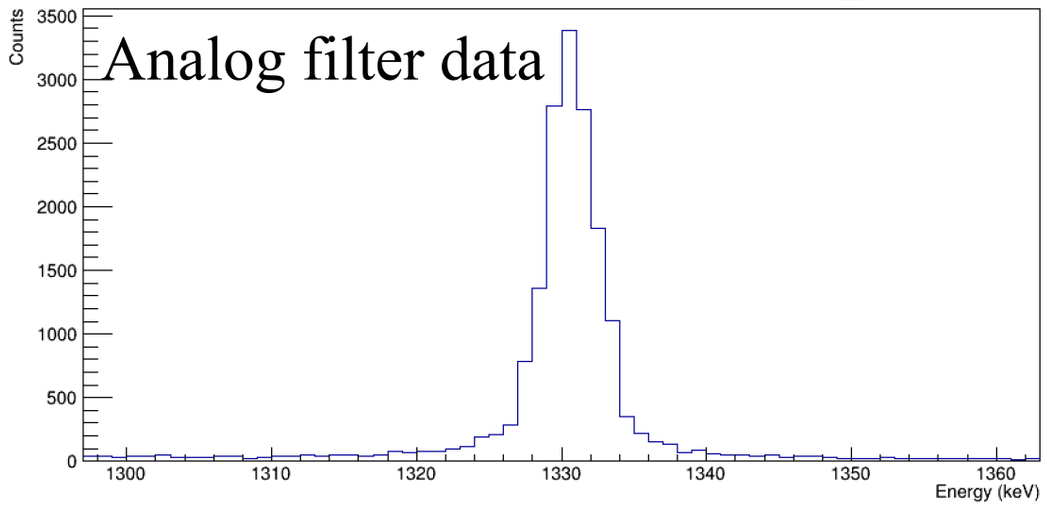
Simple Analysis

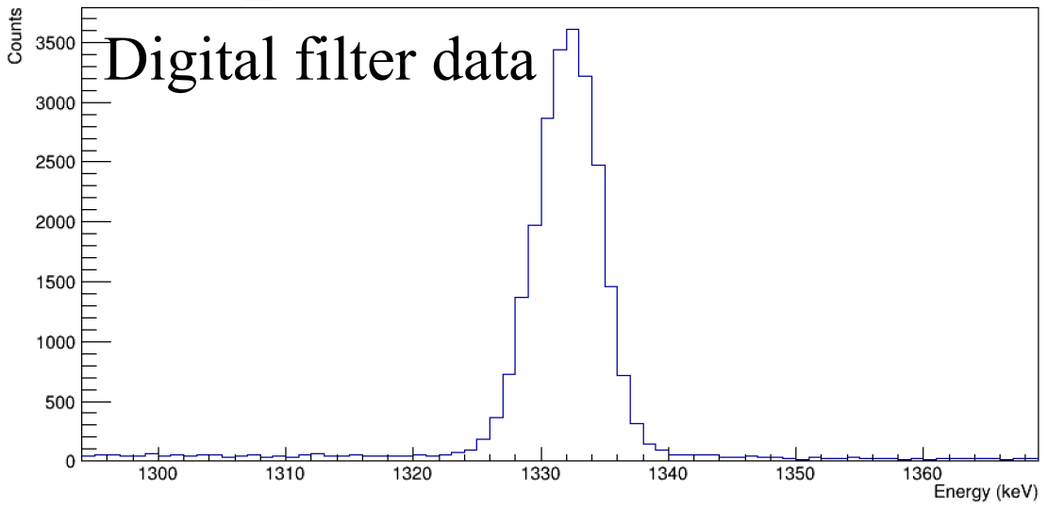


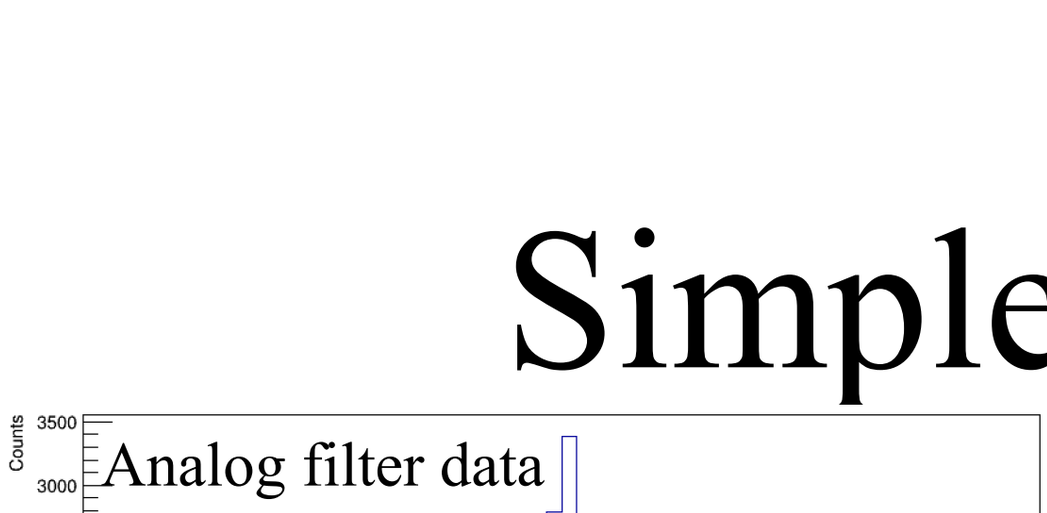


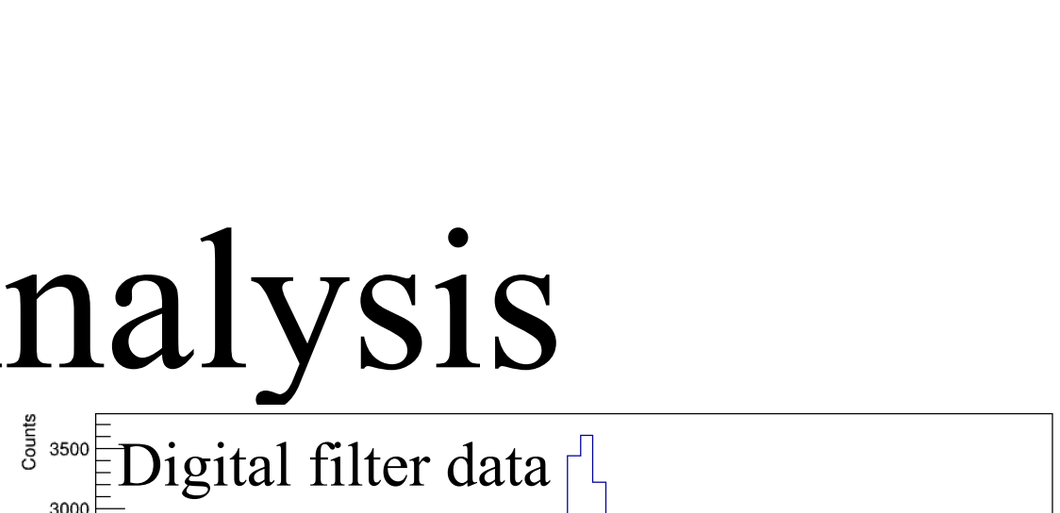
Energy resolution : 5.86 keV @ 1332.5 keV(~0.44%)

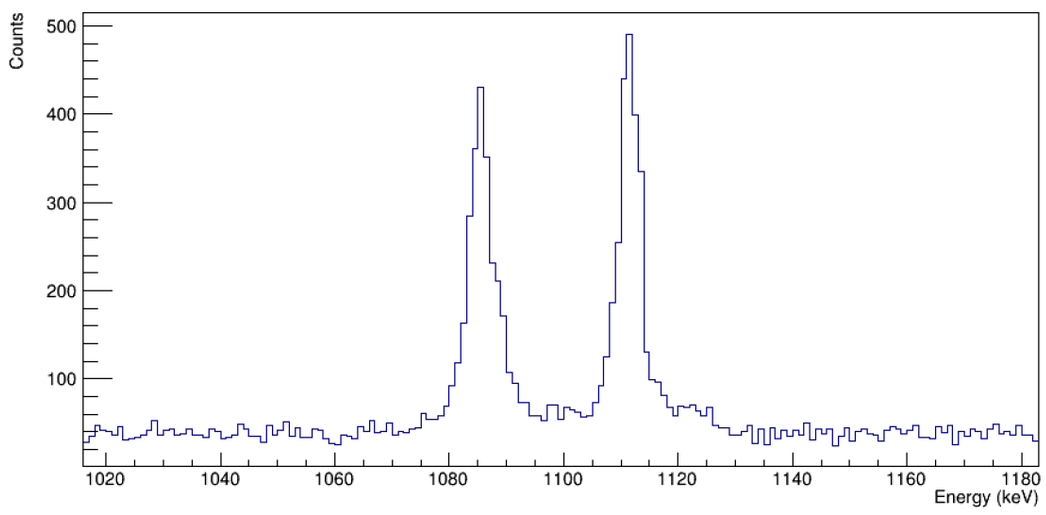
Simple Analysis

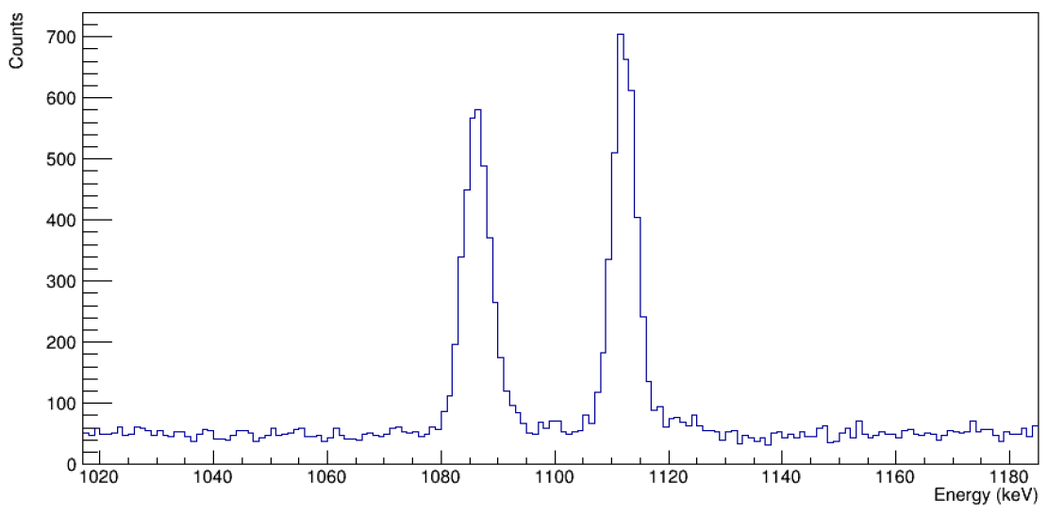












Future Plan

- Improve the energy resolution of the digital filter method.

- Implant the digital filter algorithm in the DAQ code to store only the ADC value. Advantage in the data size.

- Construct the CFD method algorithm to extract the TDC in the better time resolution.