

Meeting 16/11/2016

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Importing Spectrum to CAEN DT5800 Detector Emulator

- 3/4 options for spectrum:
 - Fixed value (no spectrum)
 - Energy spectrum from pre-set shape or isotope database
 - Import spectrum (.csv, .dat, .spectrum, ANSI N4242)
 - Sequence (repeat a stored sequence)
- Can modify spectrum shape

Choose Signal Shape

- 3 options for signal shapes:
 - Default
 - Pre-set shapes
 - Delta
 - Pulse (square)
 - Exponential
 - Shaped Exponential
 - Gaussian
 - Import pulse shape (.csv)
- Can modify signal shape and add noise

Choose Signal Time Distribution

- 4 options for time distributions:
 - Constant rate
 - Poisson distribution
 - Import time distribution (.csv)
 - Sequence

Testing with an Imported Spectrum

- Installed detector emulator software on my laptop.
- Output signal to Lecroy HDO6104 oscilloscope
- Imported spectrum file:
`/unix/pbt/af/data/clatterbridge/aug16/2in/ham_stdCub/1.98mm/ST_900V_150ns_25kHz_0_001_eh_0.dat`
- Tested with 3 pre-set signal shapes
 - Pulse (square)
 - Exponential
 - Shaped Exponential
- Generated histograms from emulated signals with inbuilt functions on oscilloscope
 - Signal Area
 - Signal Amplitude

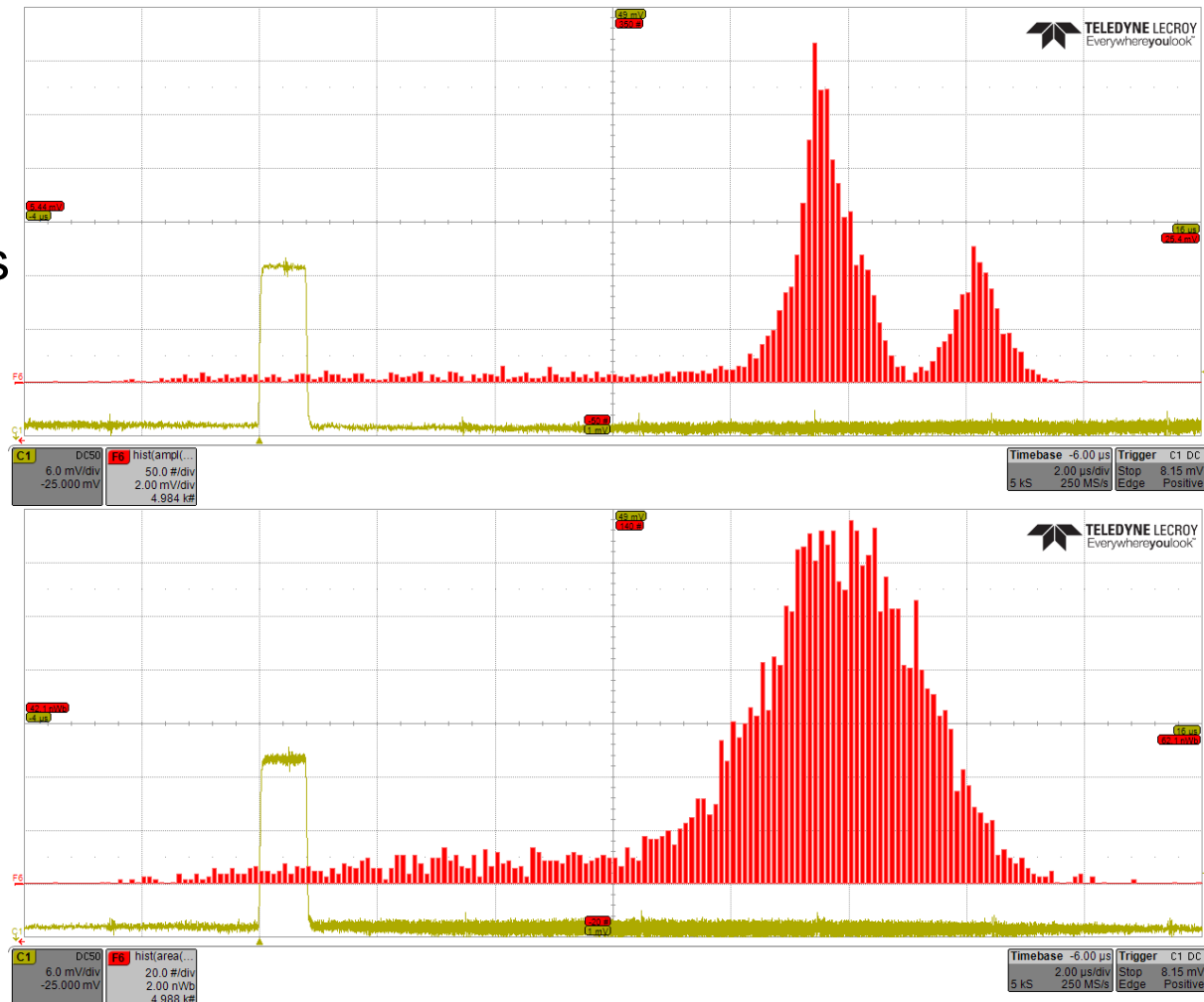
Pulse (Square)

Signal Shape:

- Offset: 16 μs
- Width: 0.8 μs
- Length: 32.76 μs
- Amplitude: 0.05 V
- Rise Slope: 0 μs
- Fall Slope: 0 μs

Histograms:

- Amplitude (top)
 - Values: ~ 5000
 - Bins: 200
- Area (bottom)
 - Values: ~ 5000
 - Bins: 200



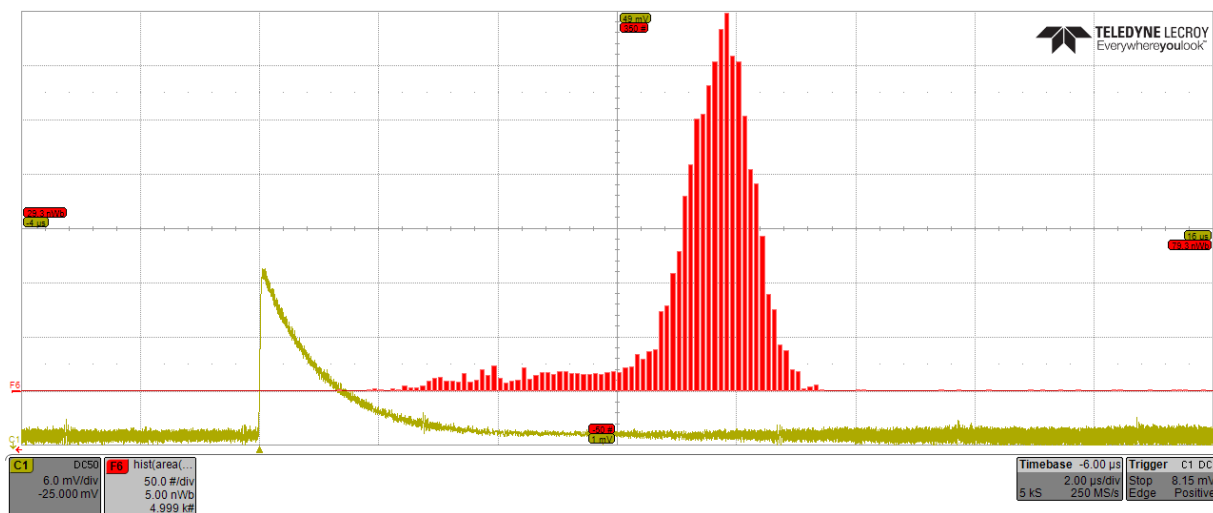
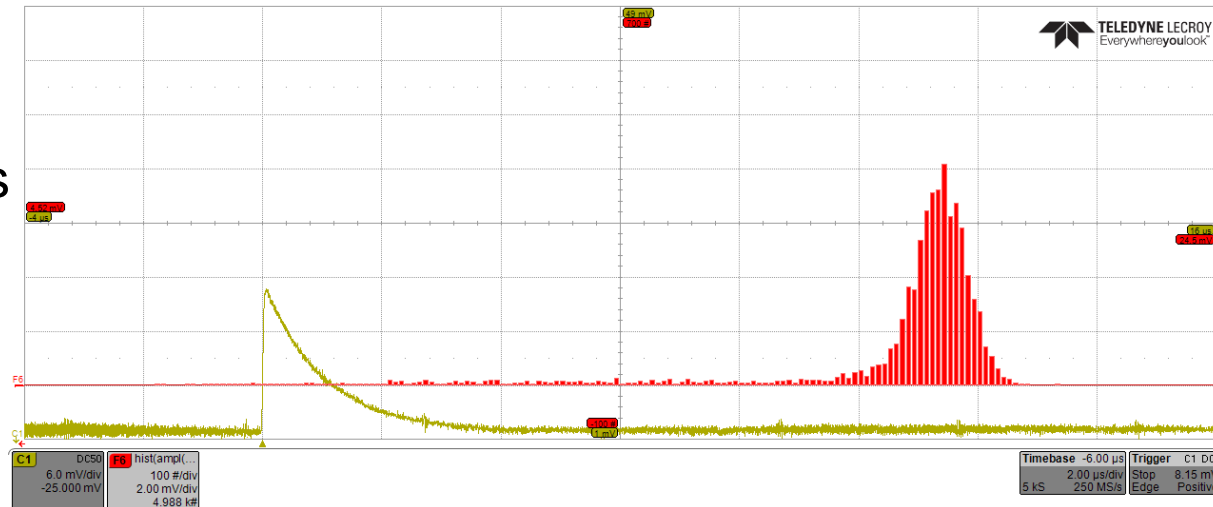
Exponential

Signal Shape:

- Offset: 0.8 μs
- Length: 32.76 μs
- Amplitude: 0.05 V
- τ : 1 μs

Histograms:

- Amplitude (top)
 - Values: ~5000
 - Bins: 200
- Area (bottom)
 - Values: ~5000
 - Bins: 200



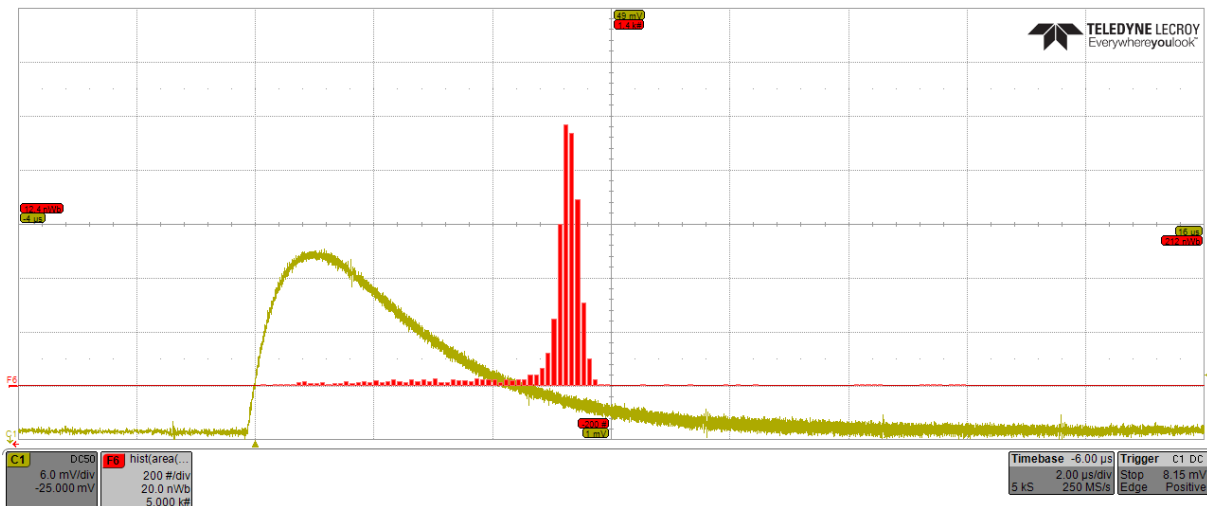
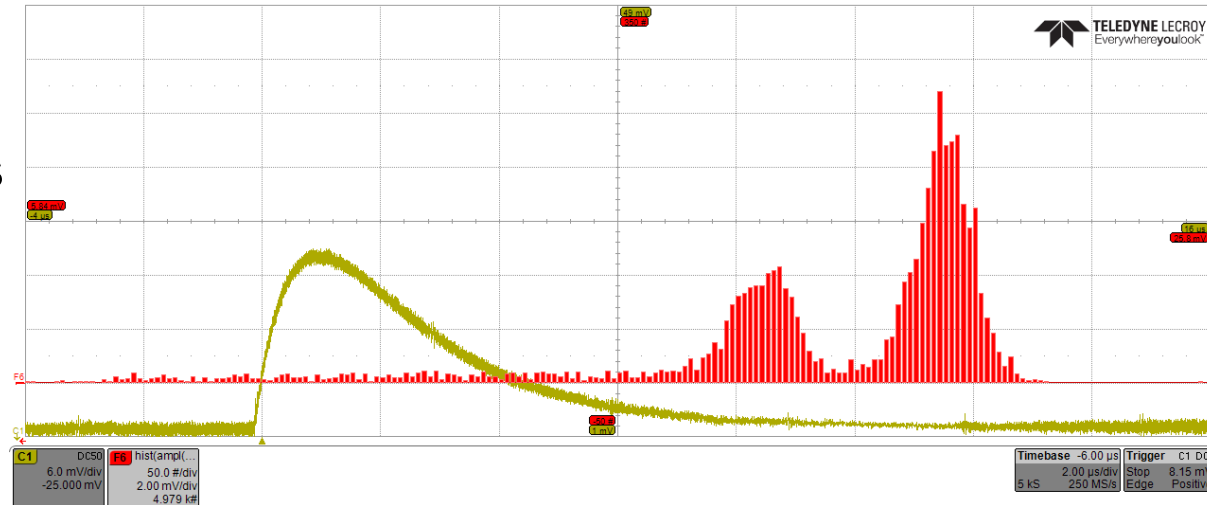
Shaped Exponential

Signal Shape:

- Offset: 0.8 μ s
- Length: 32.76 μ s
- Amplitude: 0.05 V
- τ_1 : 1 μ s
- τ_2 : 2 μ s

Histograms:

- Amplitude (top)
 - Values: ~5000
 - Bins: 200
- Area (bottom)
 - Values: ~5000
 - Bins: 200



Oscilloscope Histogram Screenshot Files

/unix/pbt/aknoetze/DT5800/

- ADCSpec_Pulse_100_AmpHist.png
- ADCSpec_Pulse_100_AreaHist.png
- ADCSpec_Exp_100_AmpHist.png
- ADCSpec_Exp_100_AreaHist.png
- ADCSpec_ExpSh_100_AmpHist.png
- ADCSpec_ExpSh_100_AmpHist.png