



Noise Scan

Date : 08 - 05- 2020

Sigma Calculation

1. Calculated from scalers :

Mean baseline position :

B_i – baseline for bin i ($i = 1..32$)

C_i – counts registered for baseline B_i

$B_{imV} = (B_i * 2) - 32$ // from LSB to mV , baseline values go from -32 to 32 mV

Mean baseline :

$$Bl\ mean = \frac{\sum B_{imV}}{\sum C_i}$$

Standard Deviation : $\sqrt{\sigma B^2} = \frac{\sum (B_i - B)^2 * C_i}{\sum C_i}$

2. From Gaussian fit
3. From S- curve measurement

4. From Rice formula : $f_t = \frac{f_0}{2} \exp\left(-\frac{V_{TH}^2}{2\sigma_v^2}\right)$

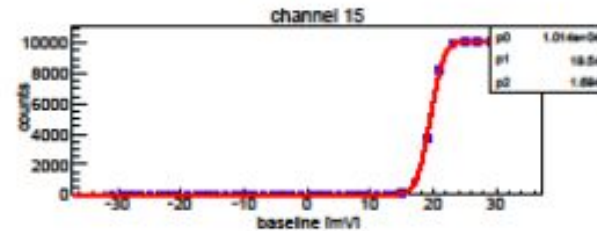
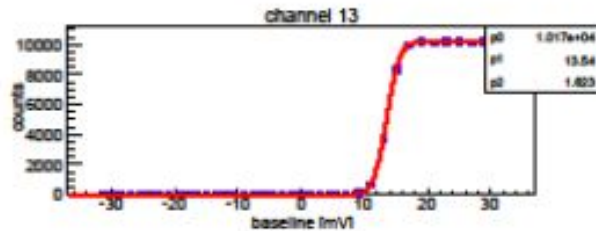
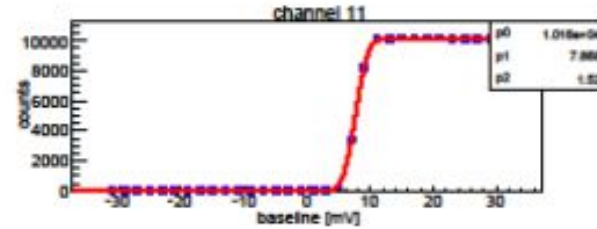
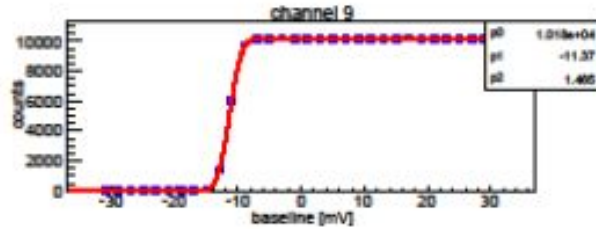
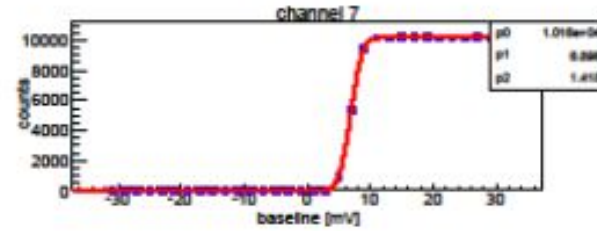
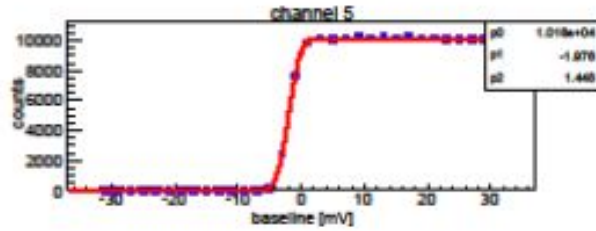
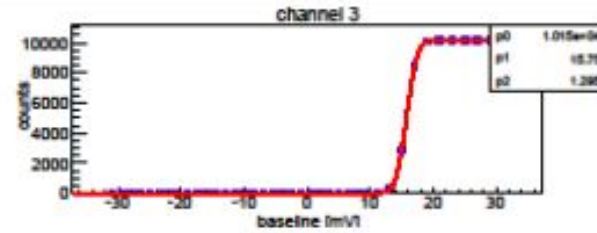
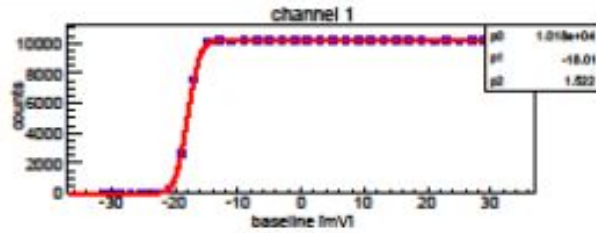
$$Slope = \frac{-1}{2\sigma^2}$$

From linear fit on log(counts) vs V^2 th

B - board
 T_p 20 ns
Connected to detector

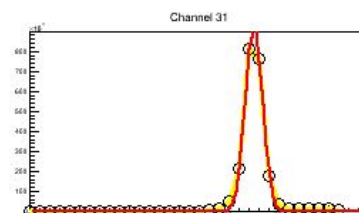
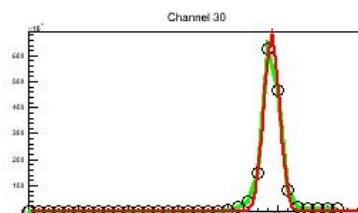
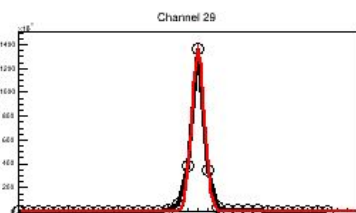
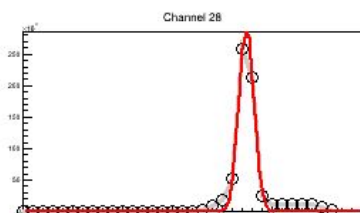
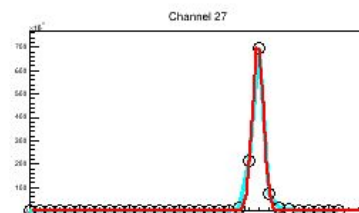
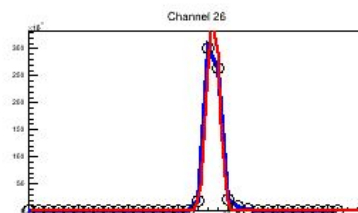
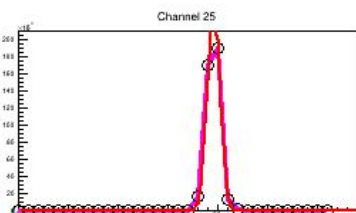
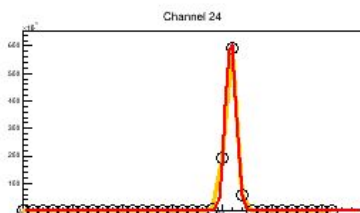
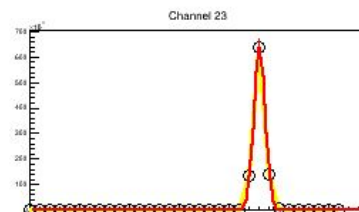
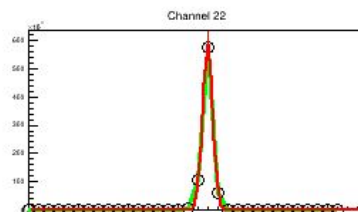
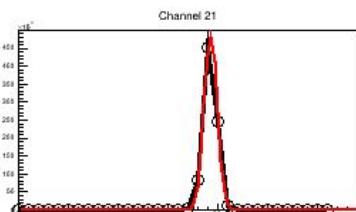
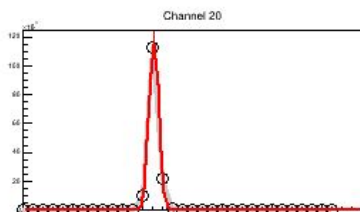
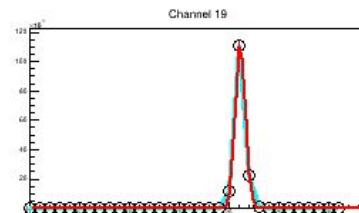
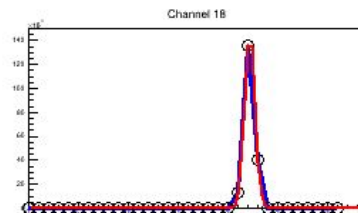
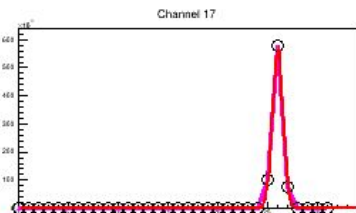
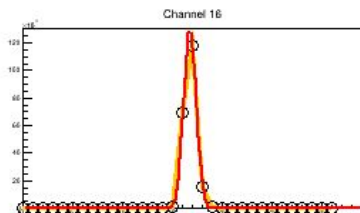
S - Curve

By. Prof.Smyrski



16 channels

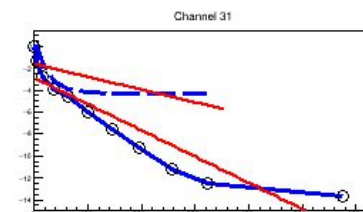
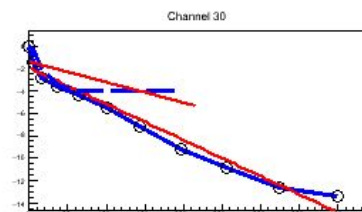
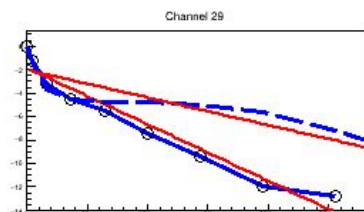
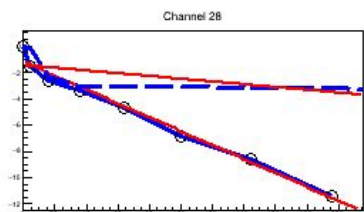
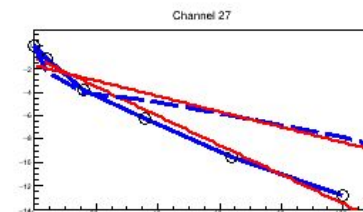
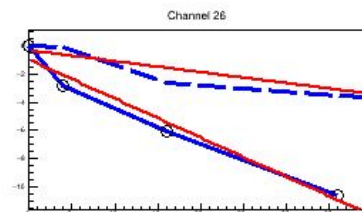
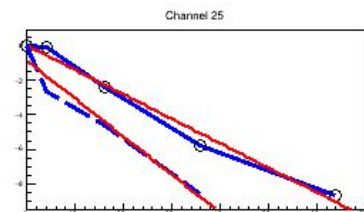
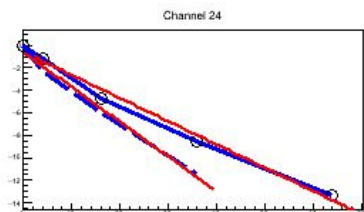
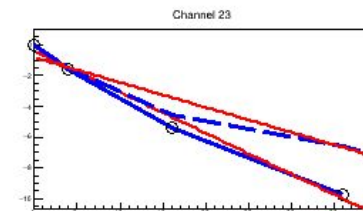
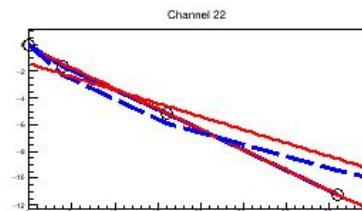
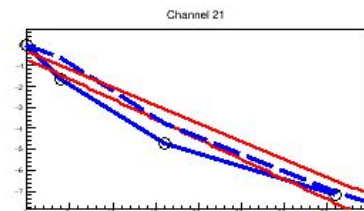
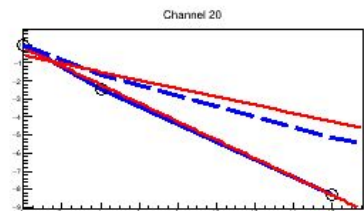
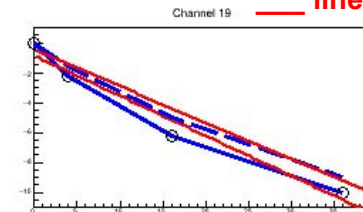
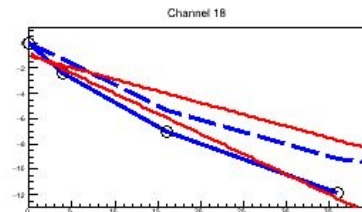
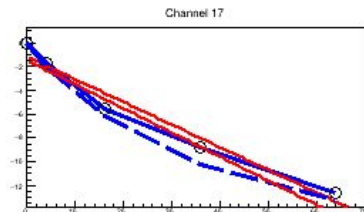
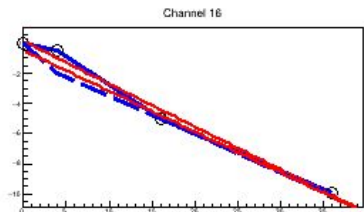
Gaus Fit



16 channels

Linear fit on : $\ln(\text{Counts})$ vs V_{th}^2

— 0 to peak
--- peak to 0
— linear fit



Sigma

Channel	Baseline scan @ thr = 0 mV			Pulse generator σ (error func. fit) mV
	σ (gaussian fit) mV	Std dev. mV	Rice function $\frac{\sigma_{peakto0} + \sigma_{0topeak}}{2}$	
1	1.24	1.23	1.34	1.52
3	1.06	1.05	1.44	1.30
5	0.99	0.96	1.23	1.45
7	1.01	0.99	1.43	1.42
9	1.08	1.10	1.41	1.47
11	1.20	1.45	1.95	1.52
13	1.49	3.79	4.99	1.62
15	1.56	2.79	4.58	1.69

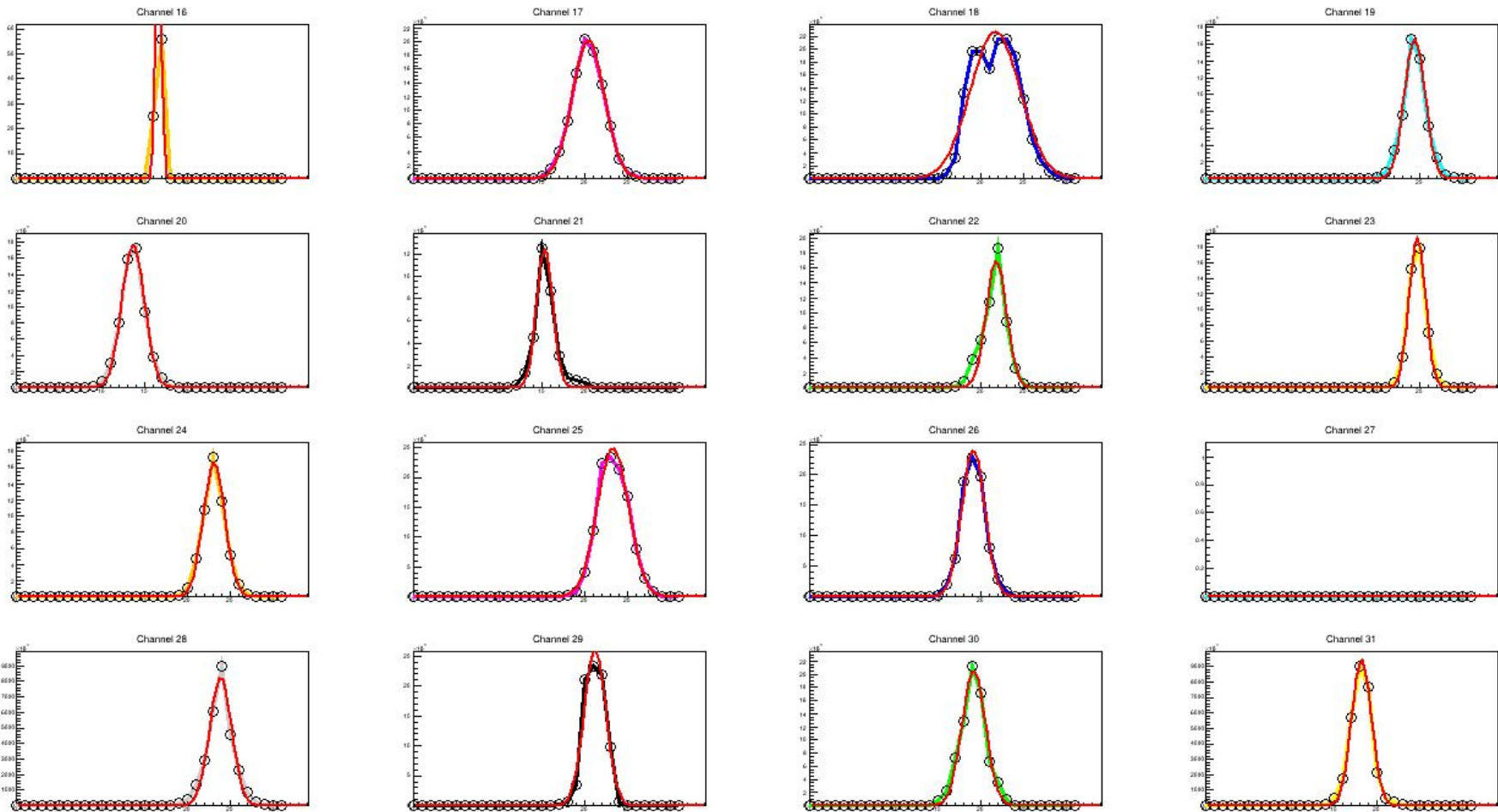
New Packed Asics

Tp 15 ns

Connected to detector

16 channels

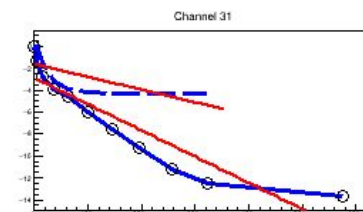
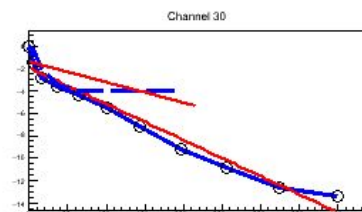
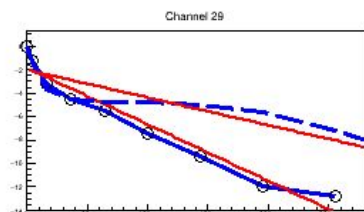
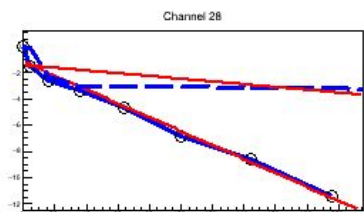
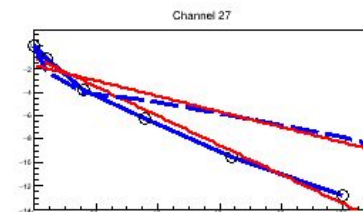
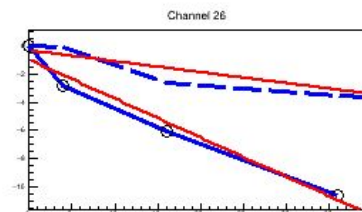
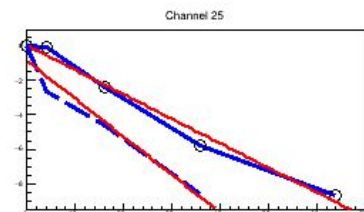
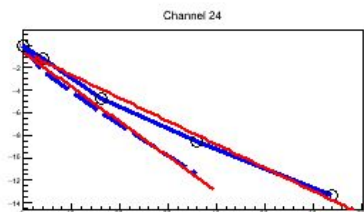
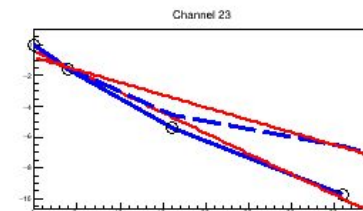
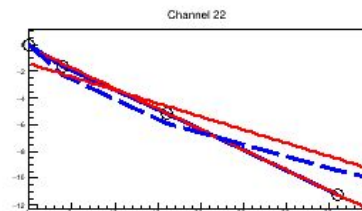
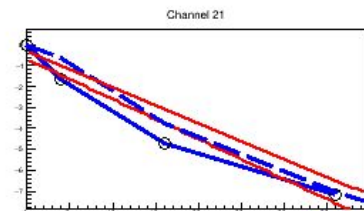
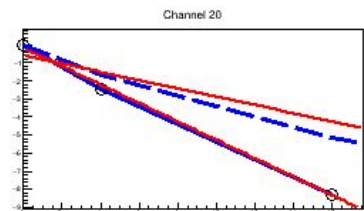
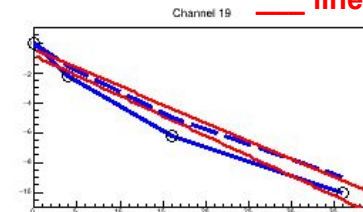
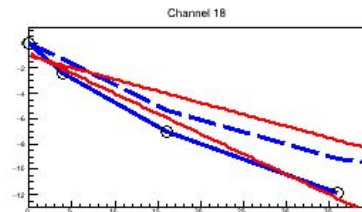
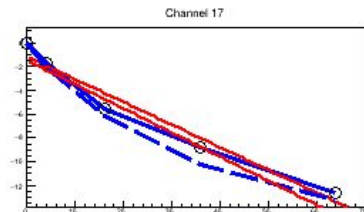
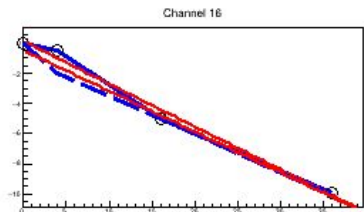
Gaus Fit



16 channels

Linear fit on : $\ln(\text{Counts})$ vs V_{th}^2

— 0 to peak
 --- peak to 0
 — linear fit



Sigma

Channel Asic 0	Baseline scan @ thr = 0 mV		
	σ (gaussian fit) mV	Std dev. mV	$\frac{\sigma_{peakto0} + \sigma_{0topeak}}{2}$
1	0.63	0.91	-nan
2	3.69	3.77	5.56
3	5.77	5.08	5.57
4	2.39	2.71	4.22
5	2.64	2.91	5.36
6	1.89	2.68	4.16
7	2.38	2.76	4.40
8	1.91	2.05	3.47

Sigma

Channel Asic 1	Baseline scan @ thr = 0 mV		
	σ (gaussian fit) mV	Std dev. mV	$\frac{\sigma_{peakto0} + \sigma_{0topeak}}{2}$
9	2.49	2.65	4.19
10	3.65	3.49	4.11
11	2.69	2.79	4.93
12	0	0	0
13	2.56	3.15	4.91
14	2.55	2.33	4.53
15	2.75	3.07	5.23
16	2.30	2.54	4.89

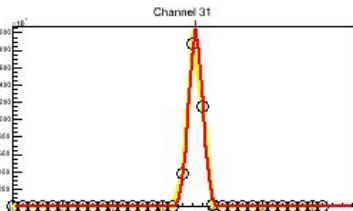
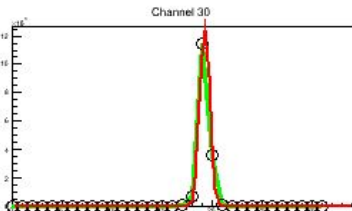
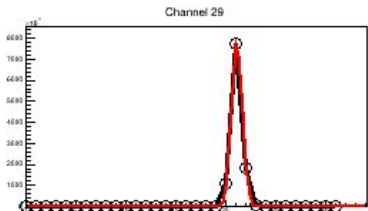
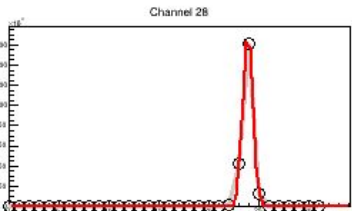
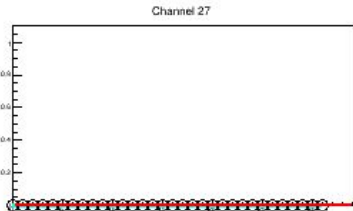
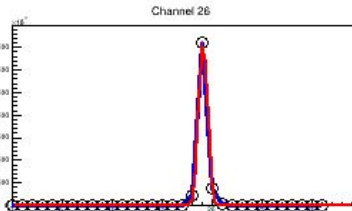
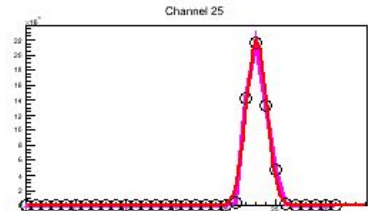
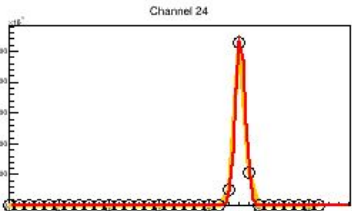
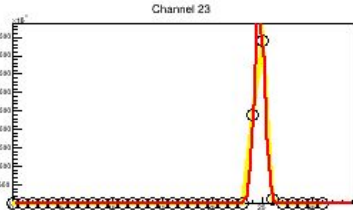
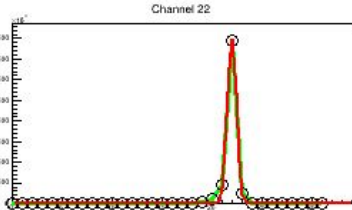
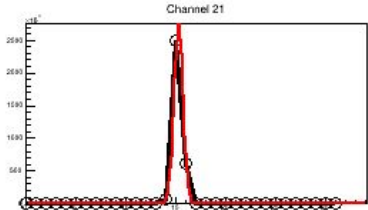
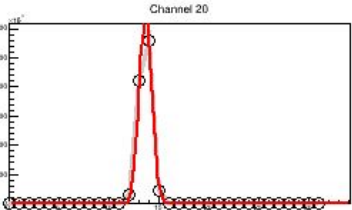
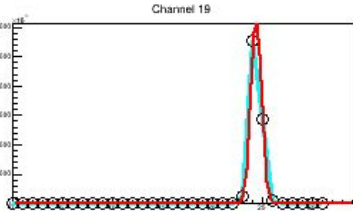
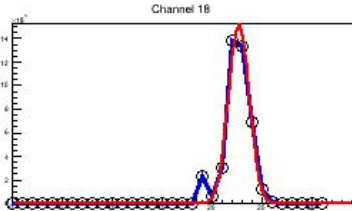
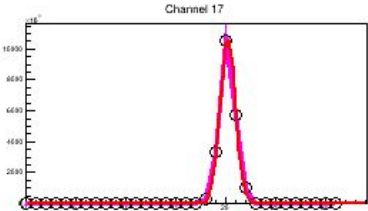
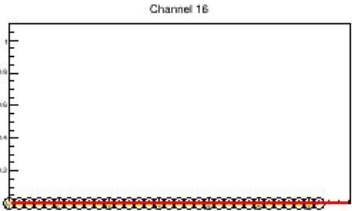
New Packed Asics

Tp 20 ns

Connected to detector

16 channels

Gaus Fit

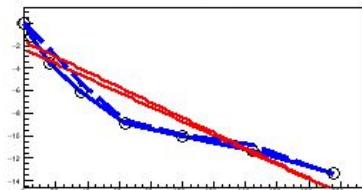


16 channels

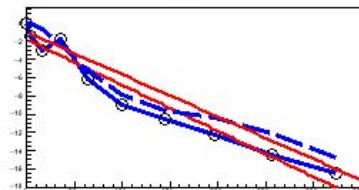
Linear fit on : $\ln(\text{Counts})$ vs V_{th}^2

— 0 to peak
--- peak to 0
— linear fit

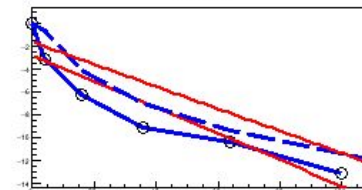
Channel 17



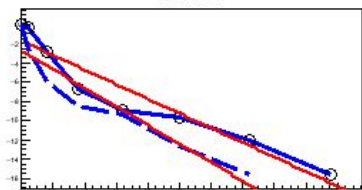
Channel 18



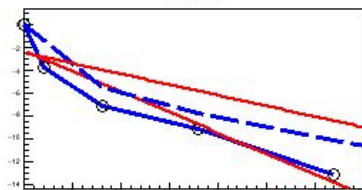
Channel 19



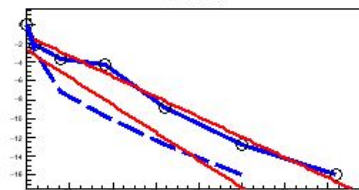
Channel 20



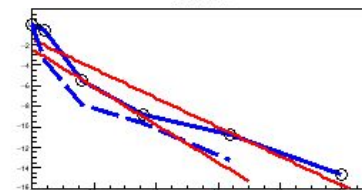
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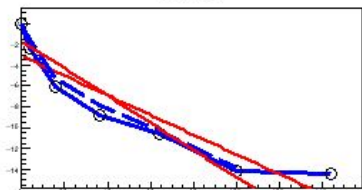
Channel 22



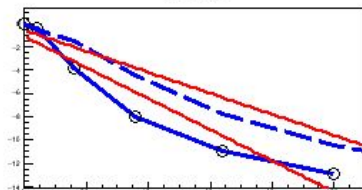
Channel 23



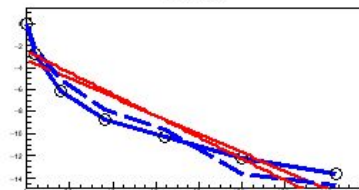
Channel 24



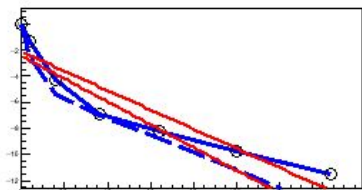
Channel 25



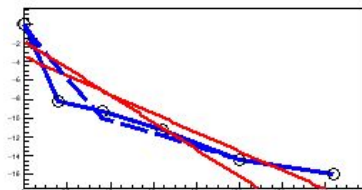
Channel 26



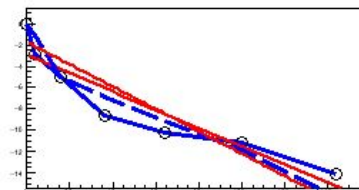
Channel 28



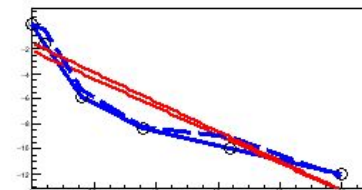
Channel 29



Channel 30



Channel 31



Sigma

Channel Asic 0	Baseline scan @ thr = 0 mV		
	σ (gaussian fit) mV	Std dev. mV	$\frac{\sigma_{peakto0} + \sigma_{0topeak}}{2}$
1	0	0	0
2	1.51	1.64	2.76
3	2.05	2.59	3.22
4	1.02	1.09	2.18
5	1.22	1.26	2.42
6	0.88	0.88	1.98
7	0.89	1.10	2.00
8	0.98	1.02	1.76

Sigma

Channel Asic 1	Baseline scan @ thr = 0 mV		
	σ (gaussian fit) mV	Std dev. mV	$\frac{\sigma_{peakto0} + \sigma_{0topeak}}{2}$
9	1.00	0.99	2.12
10	2.00	1.89	2.14
11	0.88	0.82	2.35
12	0	0	0
13	1.01	1.09	2.49
14	1.08	1.07	2.05
15	1.00	1.06	2.29
16	1.35	1.28	2.08