

Calibration of veto discriminators

Fragmentation Trigger FOOT

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Goal of the measure

Goal

We want to calibrate the inputs of board wd 166

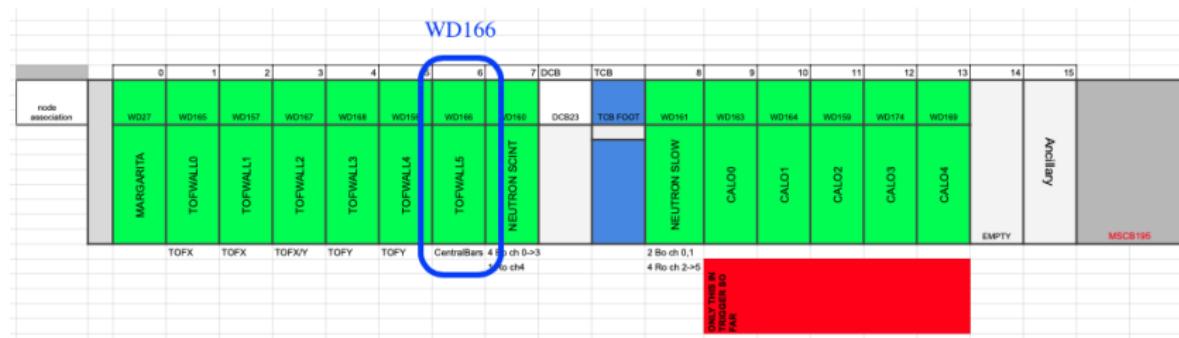
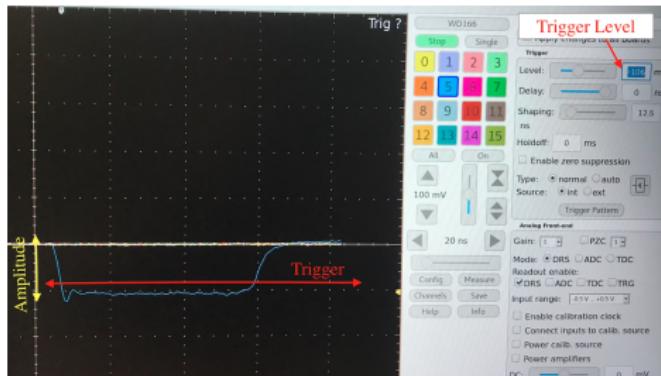


Figure: FOOT WDAQ crate configuration. Full System

Why a calibration?

Why is calibration necessary?

- Basically the problem is that the amplitude value [mV] on the PC display and the trigger value are not the same
- There is a slight difference between them that needs to be calibrated.



TGP110 Pulse Generator



Figure: TGP110. https://resources.aimtti.com/datasheets/AIM-TGP110_pulse_generator_data_sheet-lss1A.pdf

Crate

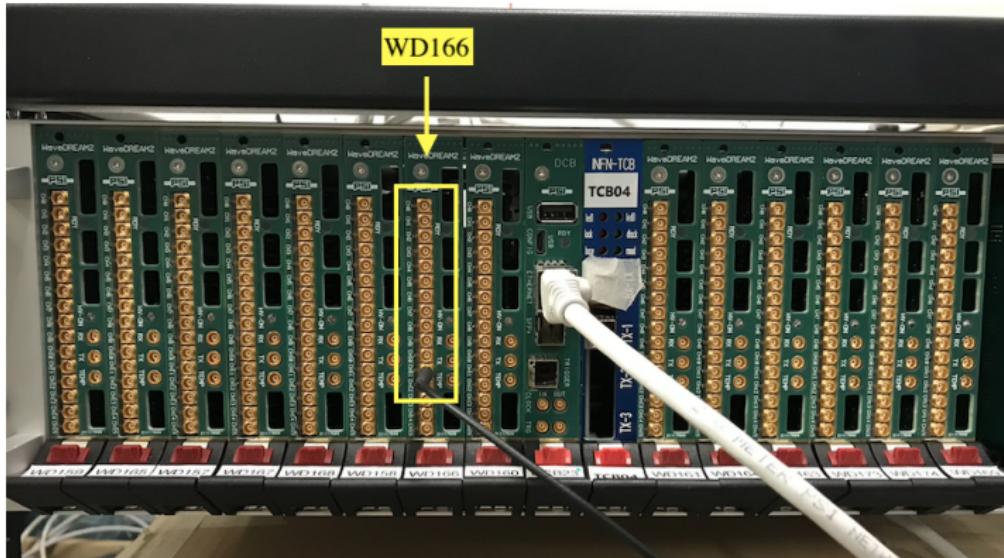


Figure: Channel 0 to 11 of WaveDream 166.

Connection map TOF

Why WaveDream 166?

Table: X-View TOF.

Ch TOF	Barra TOF	Nome WD	Slot WD	Ch WD	SiPM
16	X 8	wd166	6	0	12
17	X 8	wd166	6	1	50
18	X 9	wd166	6	2	14
19	X 9	wd166	6	3	62
20	X 10	wd166	6	4	15
21	X 10	wd166	6	5	48

Table: Y-View TOF.

Ch TOF	Barra TOF	Nome WD	Slot WD	Ch WD	SiPM
56	Y 8	wd166	6	6	71
57	Y 8	wd166	6	7	30
58	Y 9	wd166	6	8	65
59	Y 9	wd166	6	9	27
60	Y 10	wd166	6	10	73
61	Y 10	wd166	6	11	25

Method

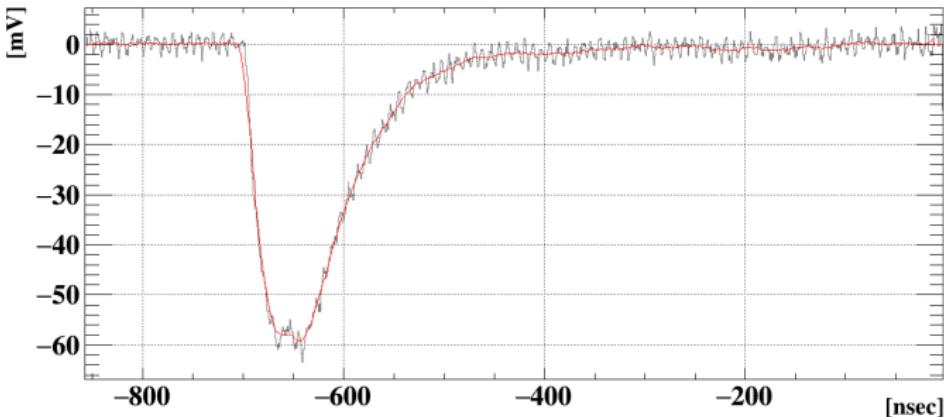


Figure: Example Waveform recorded by DRS4

- Select the channel of interest (ch 0 → 11)
- Measure the amplitude of the signal (± 5 mV)
- Correlate with the trigger value (± 3 mV)

Amplitude and Trigger correlation

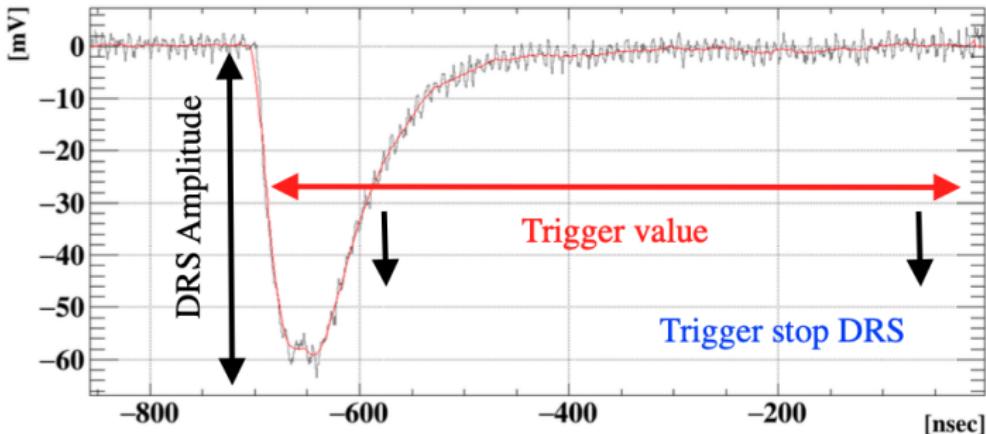
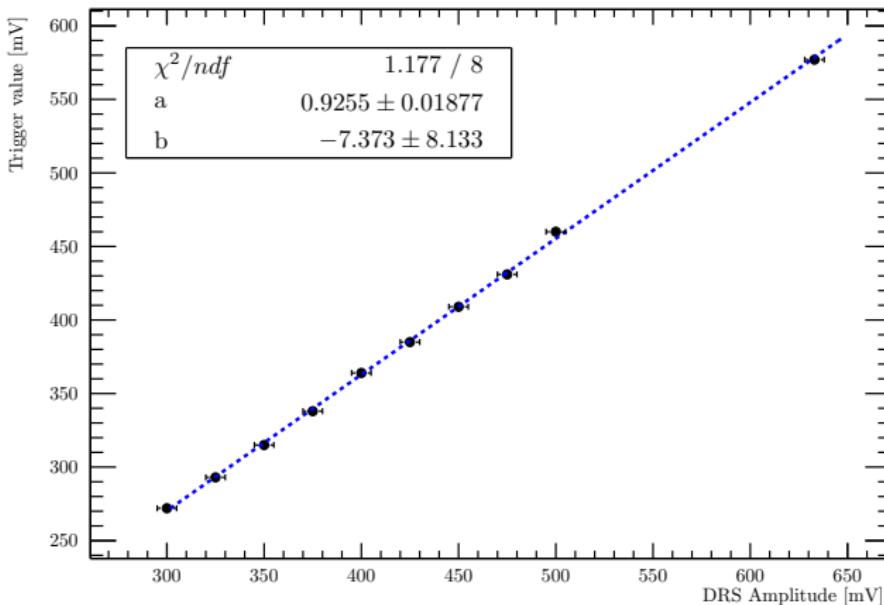


Figure: Example Waveform recorded by DRS4

- By changing the amplitude from a minimum value (300 mV) to a maximum value (full scale), in steps of 25 mV, check the linearity between the amplitude value and the trigger value.

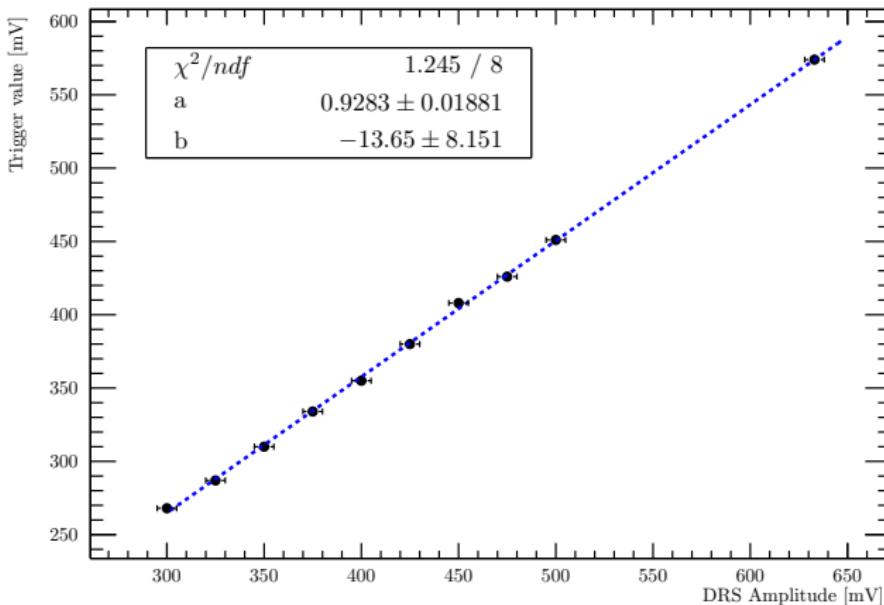
Channels calibration 0

Calibration w166 ch0



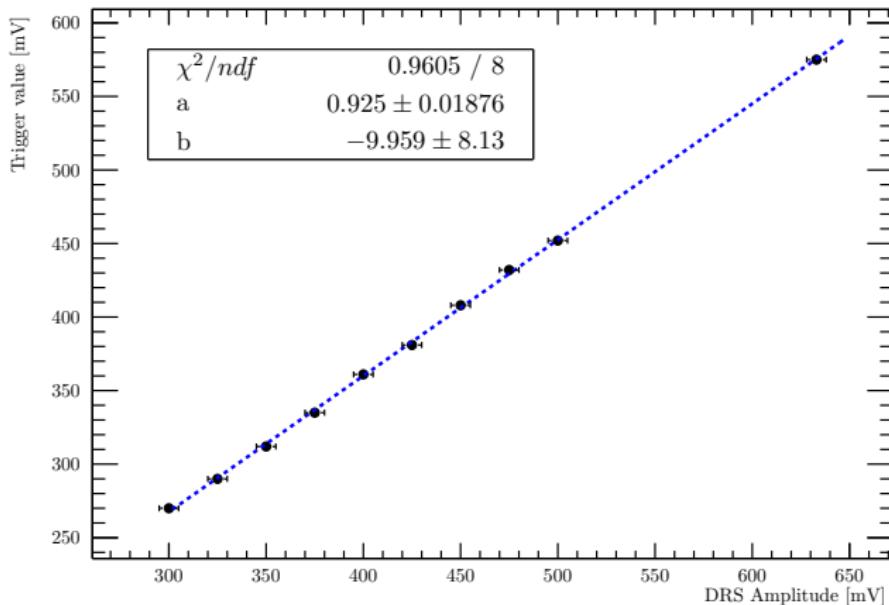
Channels calibration 1

Calibration w166 ch1



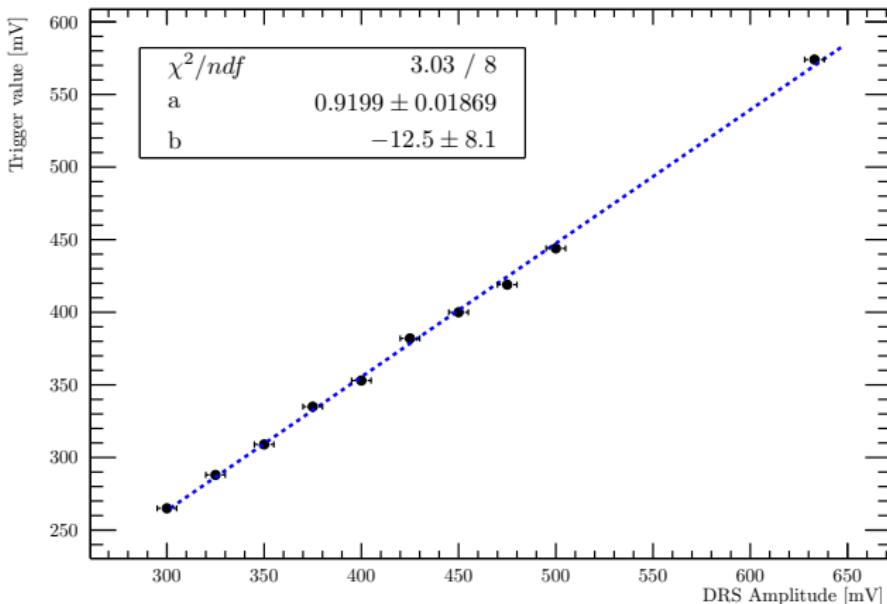
Channels calibration 2

Calibration w166 ch2



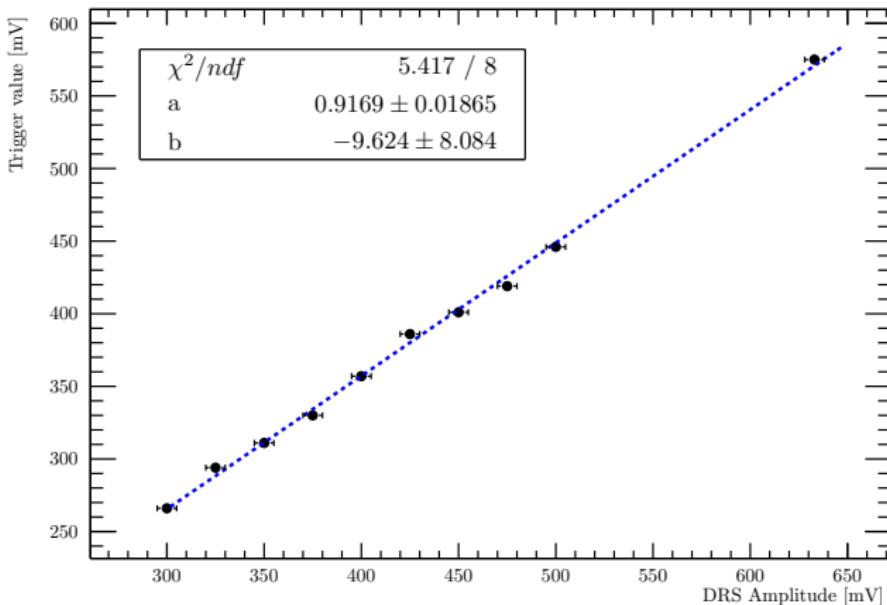
Channels calibration 3

Calibration w166 ch3



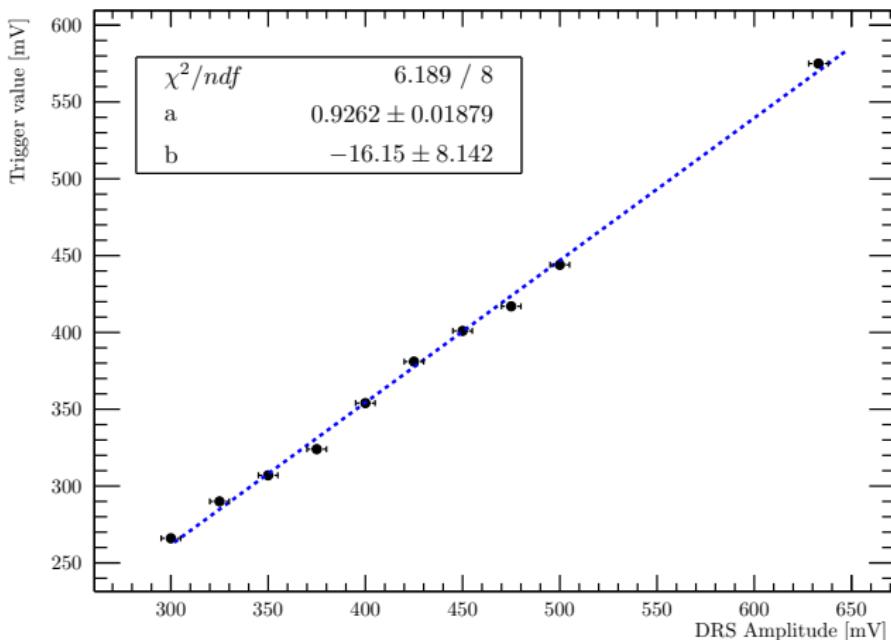
Channels calibration 4

Calibration w166 ch4



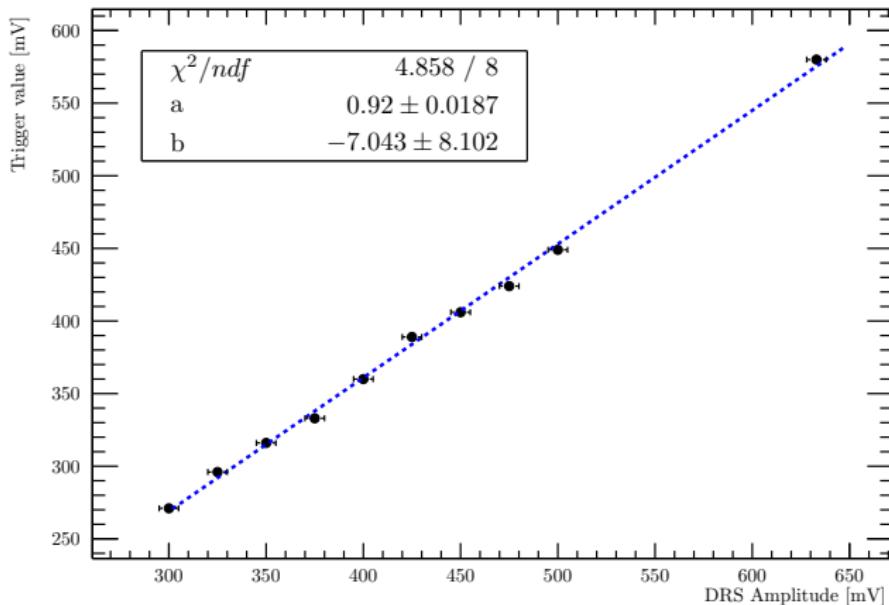
Channels calibration 5

Calibration w166 ch5



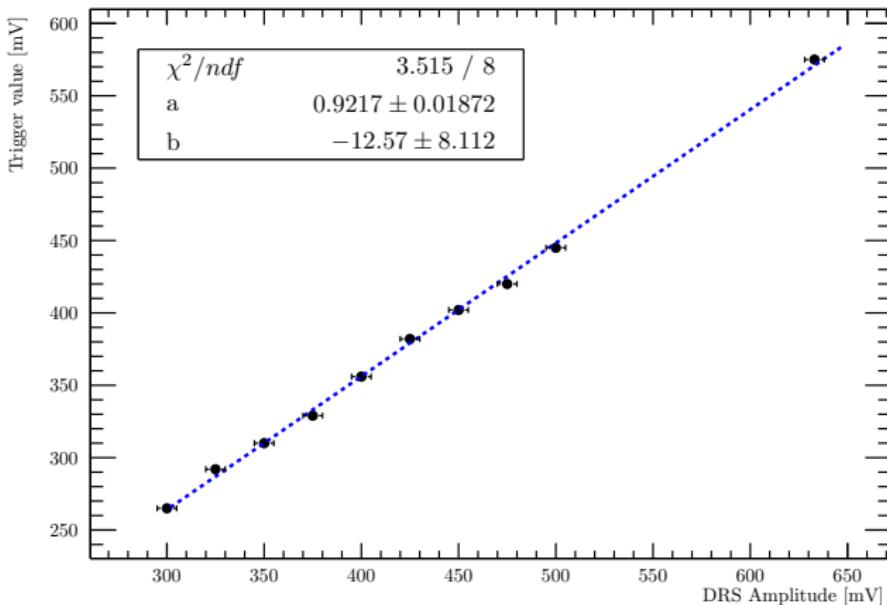
Channels calibration 6

Calibration w166 ch6



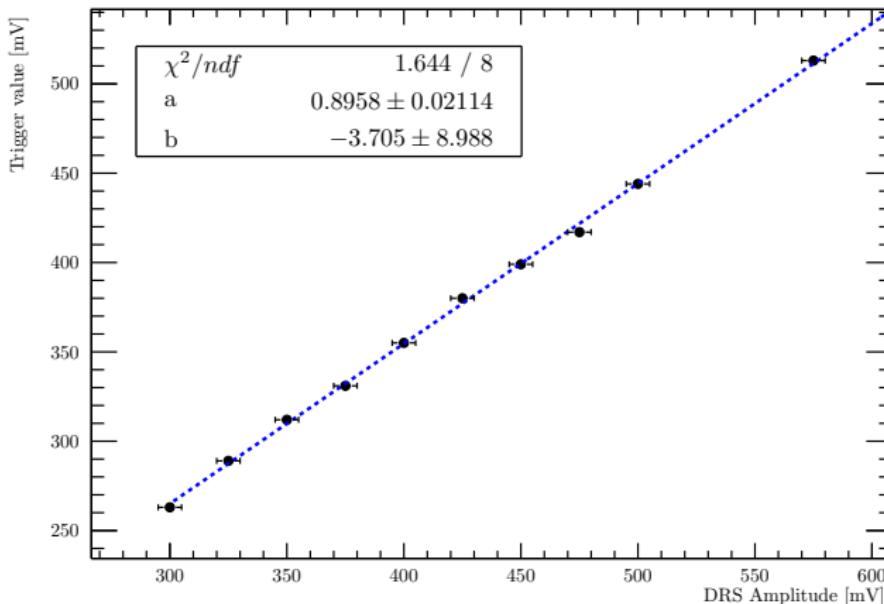
Channels calibration 7

Calibration w166 ch7



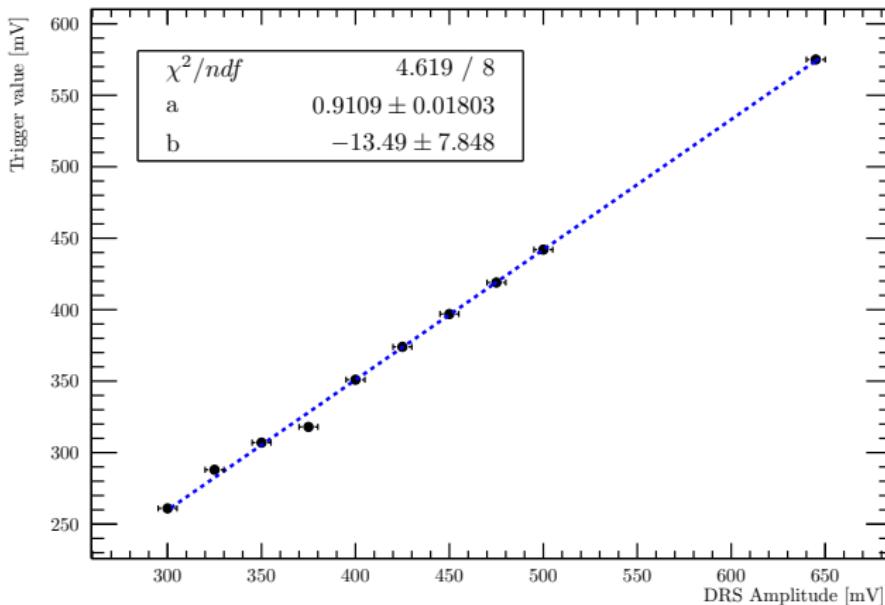
Channels calibration 8

Calibration w166 ch8



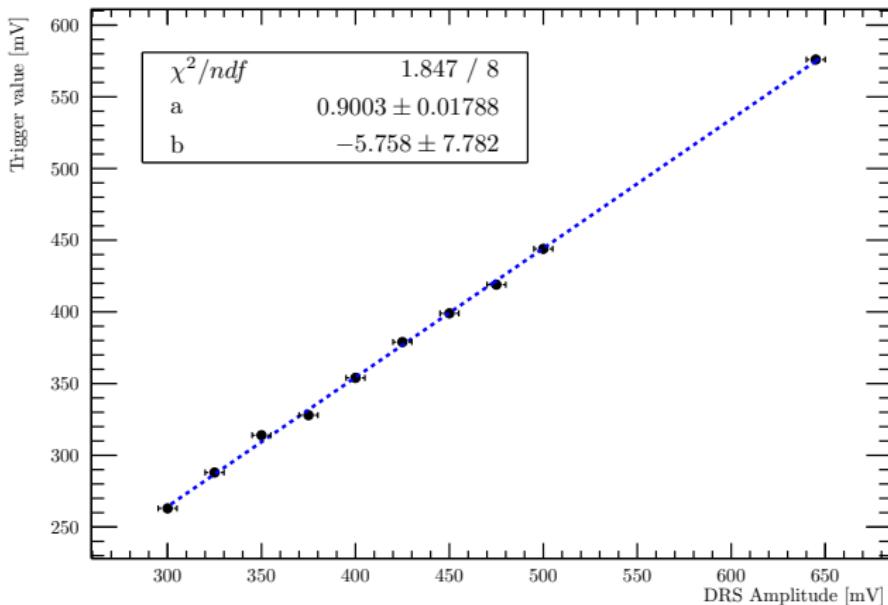
Channels calibration 9

Calibration w166 ch9

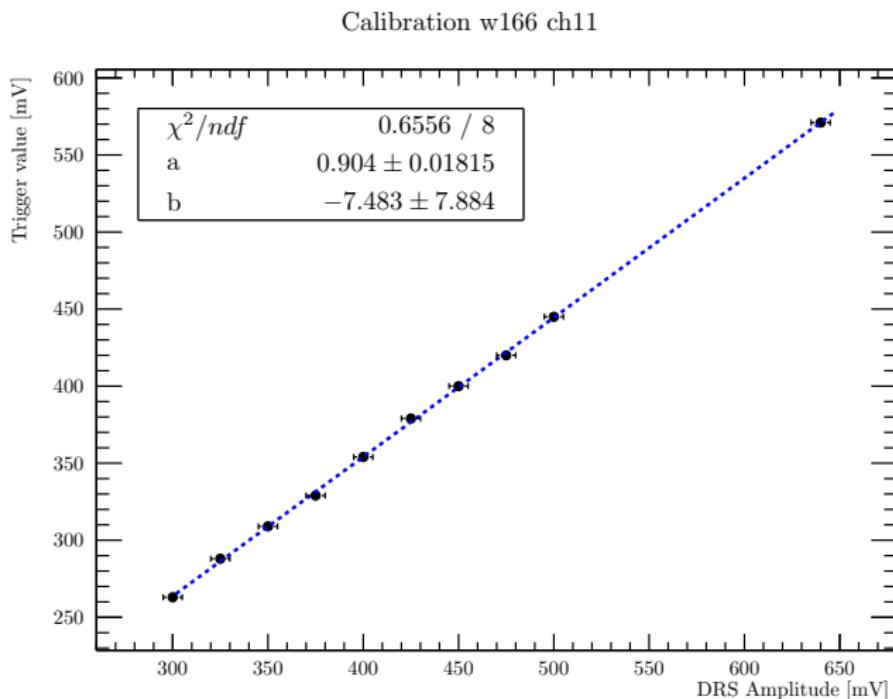


Channels calibration 10

Calibration w166 ch10



Channels calibration 11



$$\text{Trigger value} = a \times \text{DRS-Amplitude} + b$$

Channel	a [mV ⁻¹]	b [mV]
00	0.9255 ± 0.01877	-7.373 ± 8.133
01	0.9283 ± 0.01881	-13.65 ± 8.151
02	0.925 ± 0.01876	-9.959 ± 8.13
03	0.9199 ± 0.01869	-12.5 ± 8.1
04	0.9169 ± 0.01865	-9.624 ± 8.084
05	0.9262 ± 0.01879	-16.15 ± 8.142
06	0.92 ± 0.0187	-7.043 ± 8.102
07	0.9217 ± 0.01872	-12.57 ± 8.112
08	0.8958 ± 0.02114	-3.705 ± 8.988
09	0.9109 ± 0.01803	-13.49 ± 7.848
10	0.9003 ± 0.01788	-5.758 ± 7.782
11	0.904 ± 0.01815	-7.483 ± 7.884

The parameters are different because the *chips*, that are on the gain lines of all the channels, are different.