Status Quo

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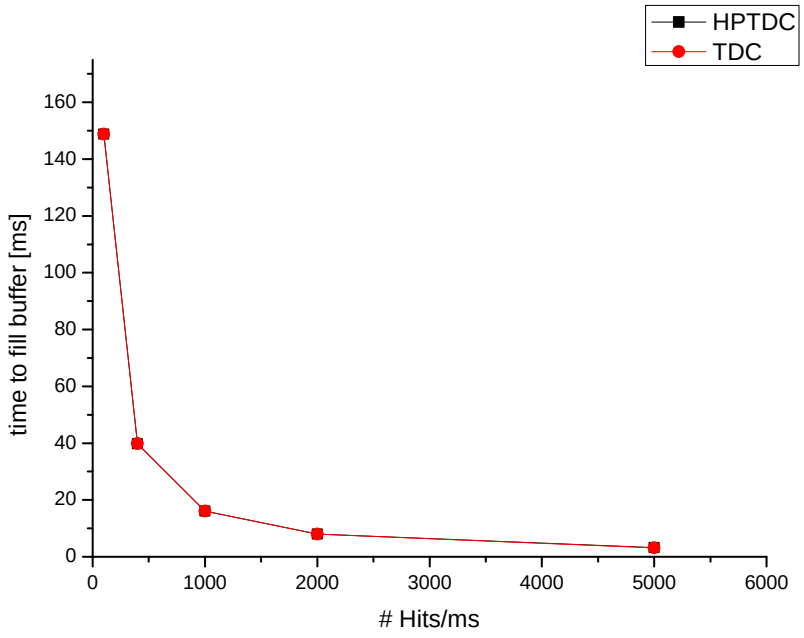
Tests of the HPTDC

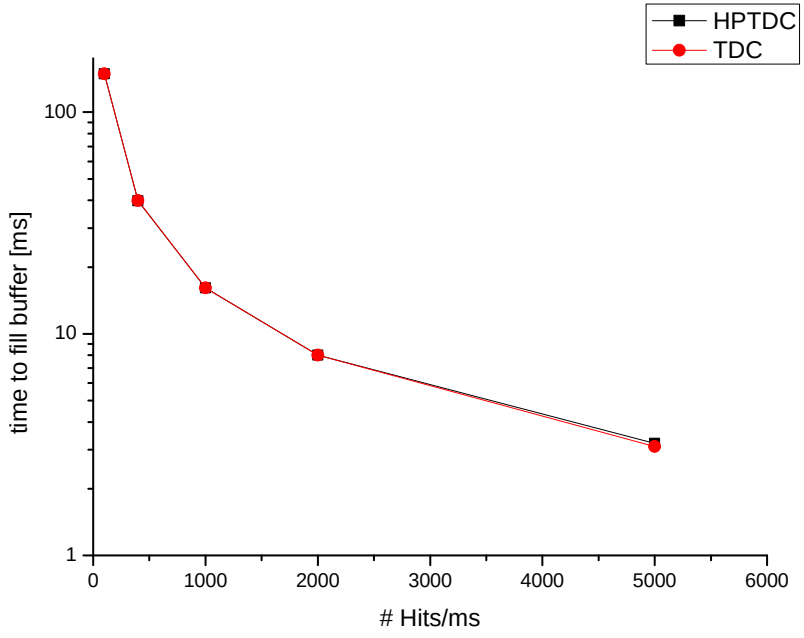
- problem with the new HPTDC: size of the BLT is just 1024 words
- for the calculation of the hits we need a reference signal (orbit trigger)
- high hitrate $\rightarrow$ get a trigger signal in a BLT of 1k just by chance
- Elena made a loop
- the BLT is 1k but we are saving 16 BLTs
- at the file are 16k

Time to Fill Buffer

Measurements about the time to fill 16k of the buffer



time to fill buffer



time to fill buffer with logarithmic scale

Time of one Block Transfer

size of BLT	TDC	HPTDC
1k	0,3 ms	0,26 ms
16k	3,5 ms	4,2 ms

Table: Time for the Block Transfer

- time for BLT is independent of hit rate
- reason that the BLT for the HPTDC and 16k is slower than for the TDC:
  you need more time for $16 \times 1k$ than for $1 \times 16k$

Offset of the Discriminator

What was the problem with the discriminator?
We don't get a output signal of the discriminator even though the amplitude of the input voltage was higher than the threshold.

Setup and Method

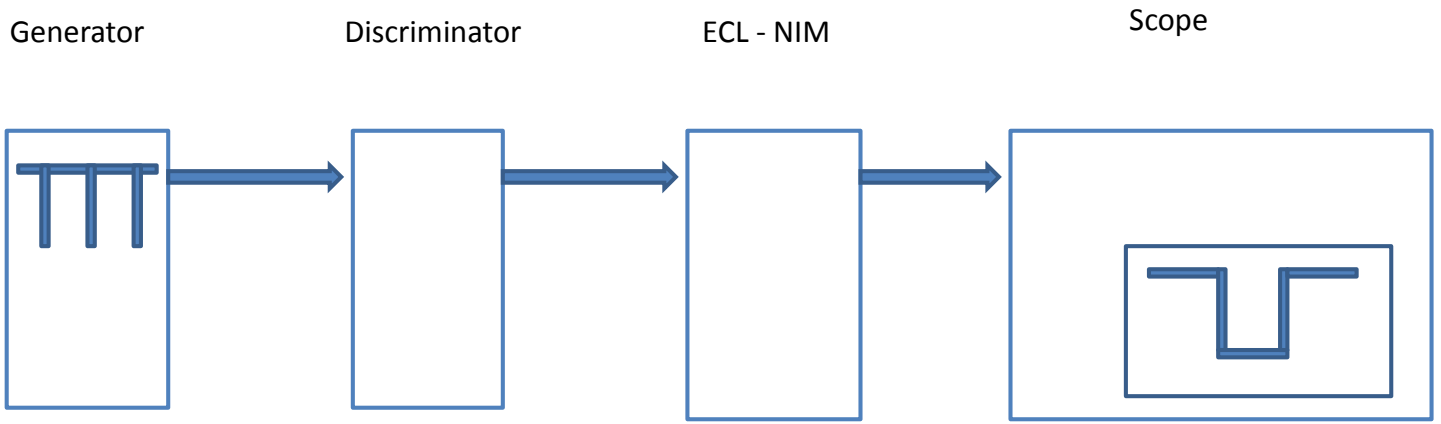


Figure: Setup

- set the threshold to a constant value V_{thr}
- amplitude of the voltage V_{out} at the generator is changeable
- set the amplitude lower than the threshold
- increase the amplitude until we see a signal on the scope

V_{thr}	V_{out} for channel 1/1
-10 mV	-23 mV
-20 mV	-33 mV
-30 mV	-43 mV
-40 mV	-53 mV
-50 mV	-64 mV
-60 mV	-75 mV
-70 mV	-85 mV
-80 mV	-95 mV
-90 mV	-105 mV
-100 mV	-115 mV

Table: Offset of the Discriminator for channel 1/1

Offset

- real threshold is:

$$V_{\text{realthreshold}} = V_{\text{threshold}} + V_{\text{offset}}$$

- get the offset out of the graph

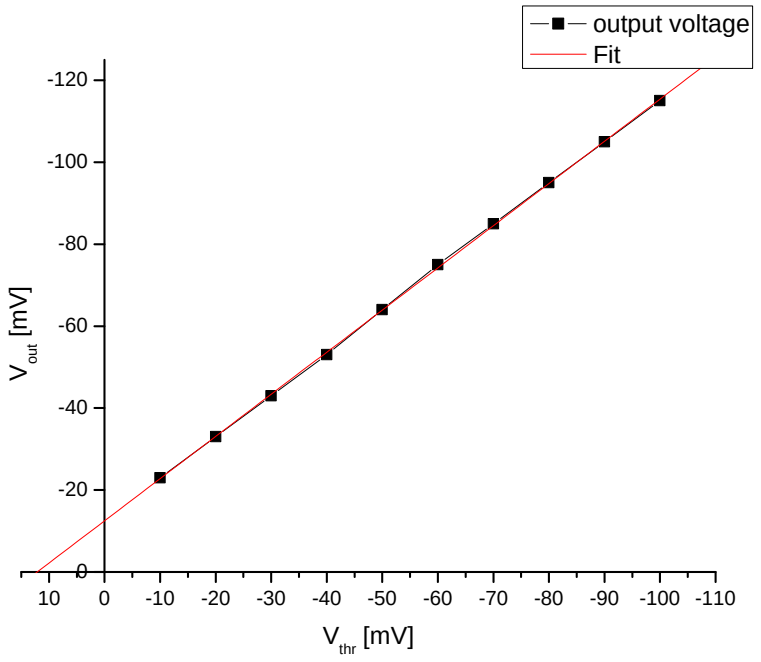


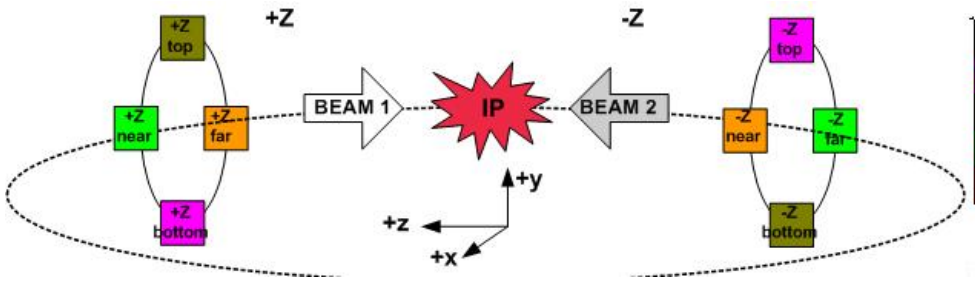
Figure: Connection between the voltage of the threshold and the voltage of the generator

The offset of each channel is:

channel	offset [mV]
1/1	12.106
1/2	12.452
1/3	12.566
1/4	11.426
2/1	11.29
2/2	11.657
2/3	12.742
2/4	12.742

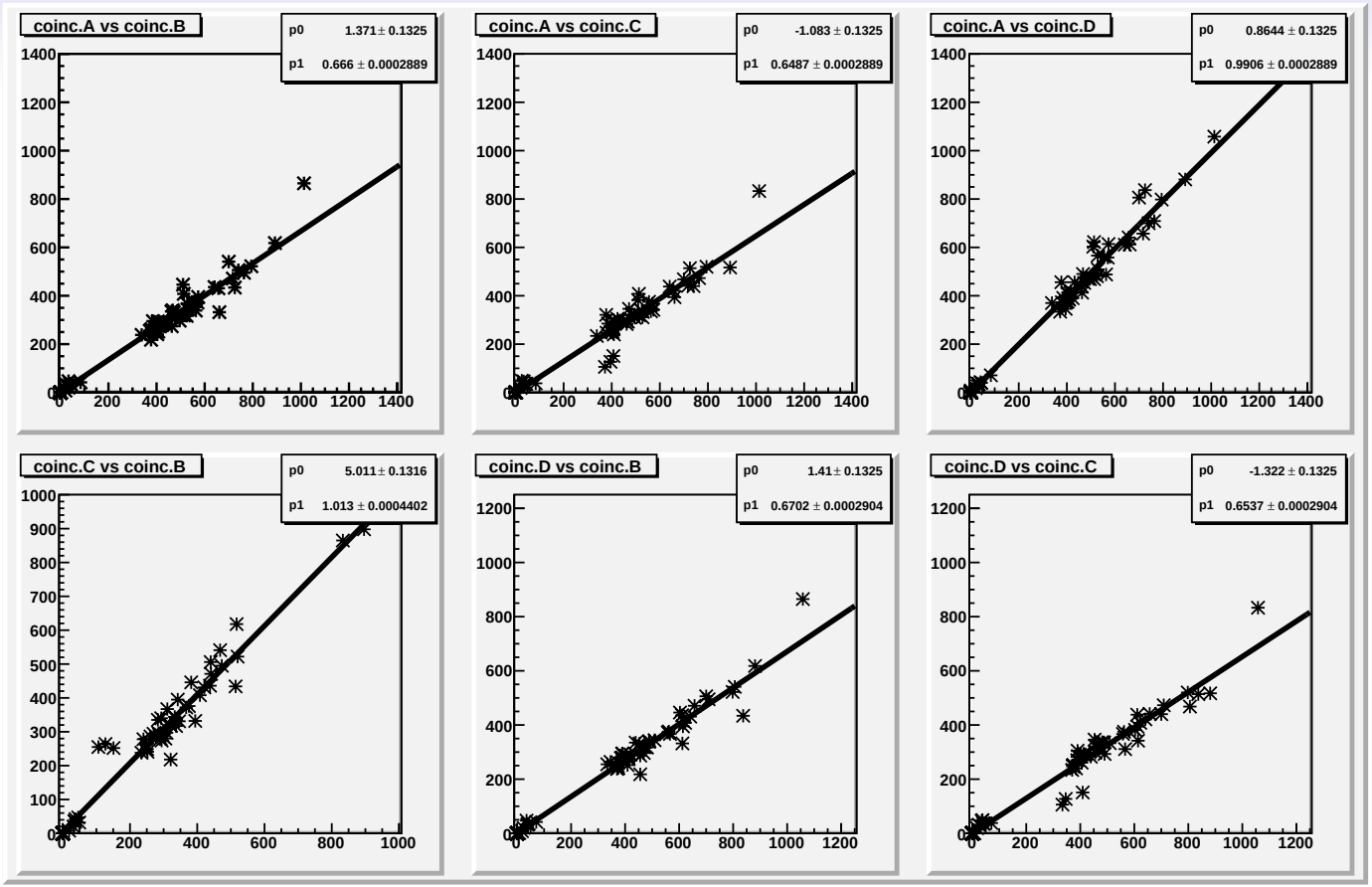
Table: Offset of all channels at the discriminator

Correlations



Coincidences in LUT	BCM1F channels
A	-Z top & +Z bottom
B	+Z top & -Z bottom
C	+Z near & -Z far
D	-Z near & +Z far

- each second we measure the coincidences
- sum up some coincidences
- plot correlation between two coincidences
- should be line with a 45° angle if we sum up a lot coincidences
  $\longrightarrow$ because the coincidences should be the same



- we can measure the angle for each correlation
- made the measurements for different data/ dates
- angle should be the same for each data and correlation

Correlation	angle [°] 29.7.	angle [°] 19.7	angle [°] 15.7.	angle [°] 14.7	angle [°] 5.8	angle [°] 6.8
A vs B	33.42	34.12	33.25	33.9	34.98	33.64
A vs C	32.97	33.86	33.27	34.06	34.32	33.08
A vs D	44.73	43.69	43.79	44.32	44.19	42.78
C vs B	45.37	45.14	44.66	44.21	45.45	45.23
D vs B	33.83	35.05	34	34.08	35.49	35.35
D vs C	33.17	34.8	34.09	34.25	34.95	34.7

Table: Offset of all channels at the discriminator

- angle are not 45°
- angle is the same for each correlation $\rightarrow$ independent of the date