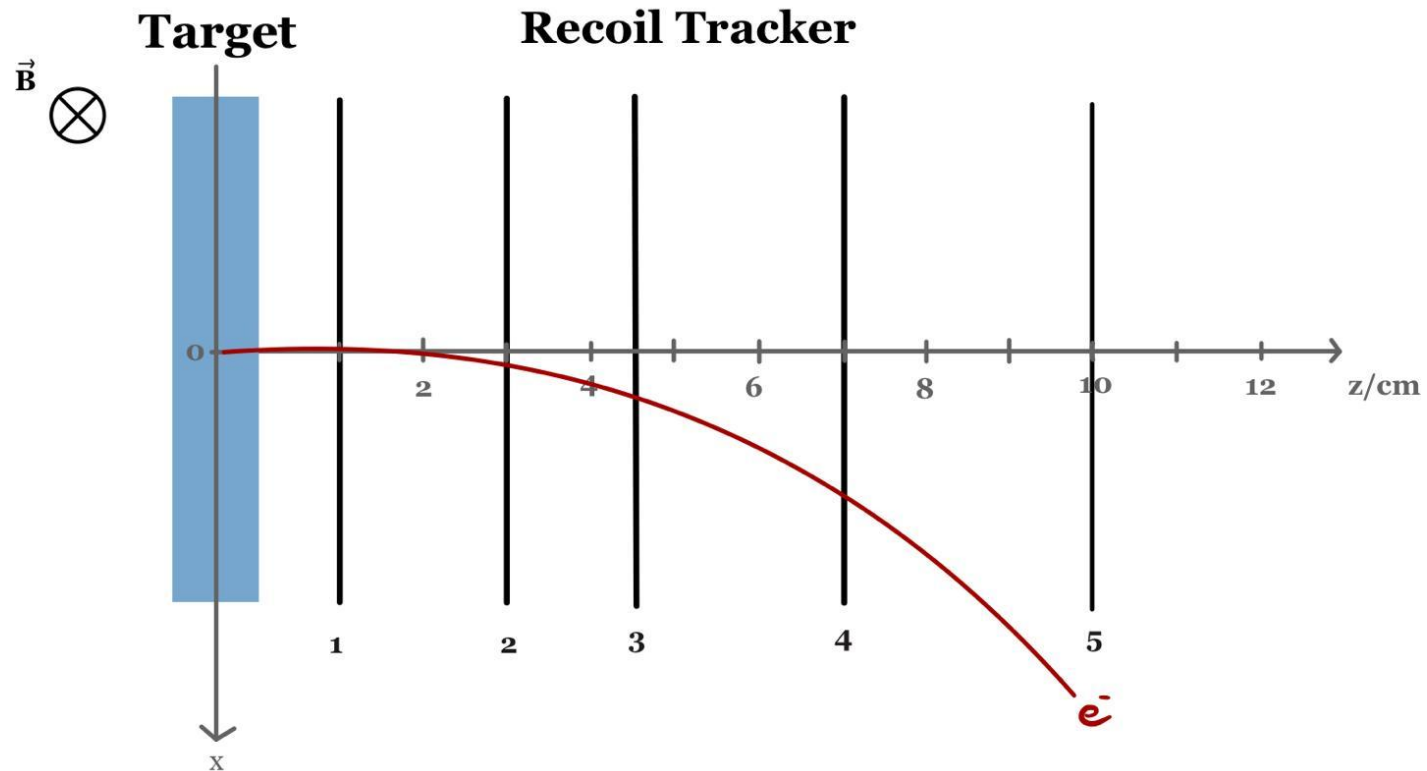
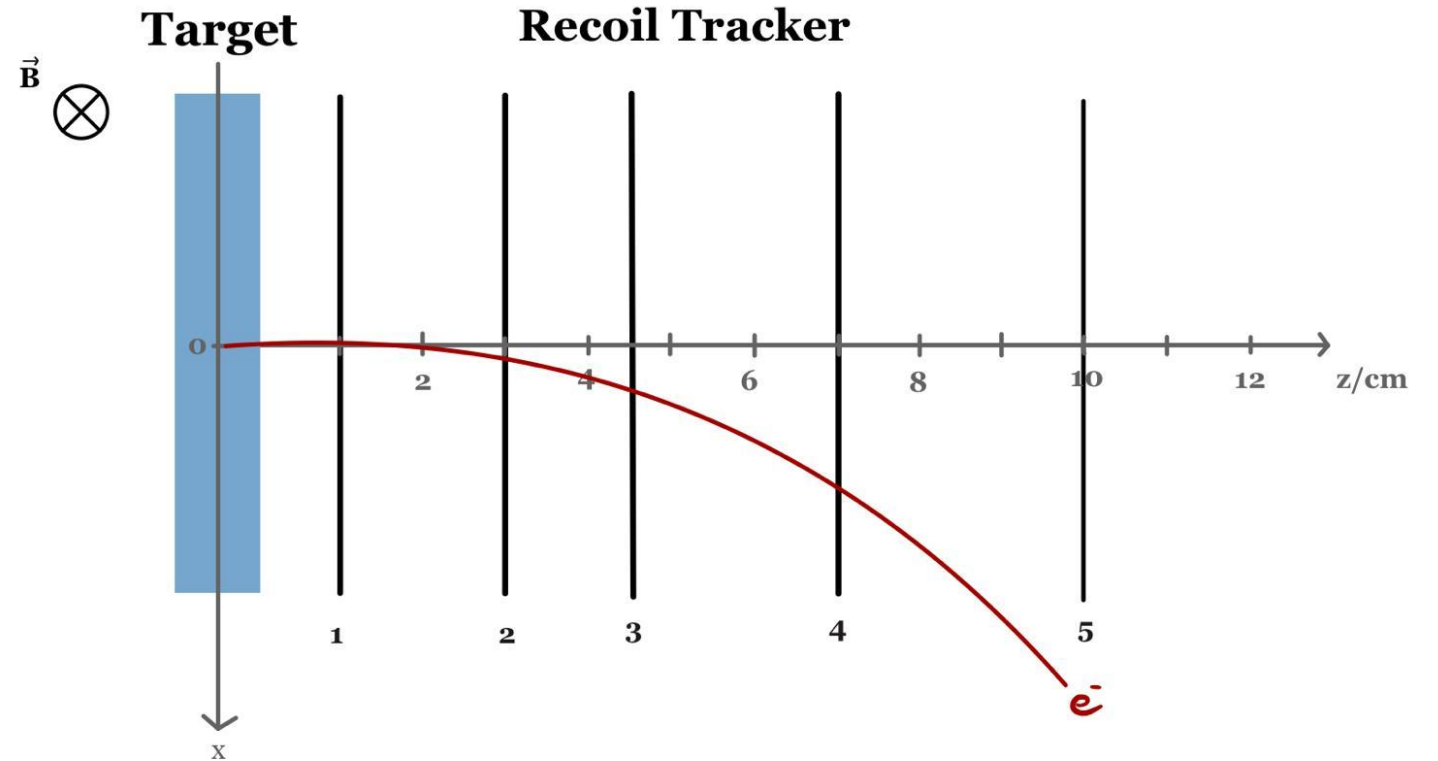


# Trigger System

- Reduzierung der gespeicherten Eventraten von 100 MHz auf 1 MHz
- Reduzierung mit ultraschnellem HitOr-Signal auf 3.7 MHz



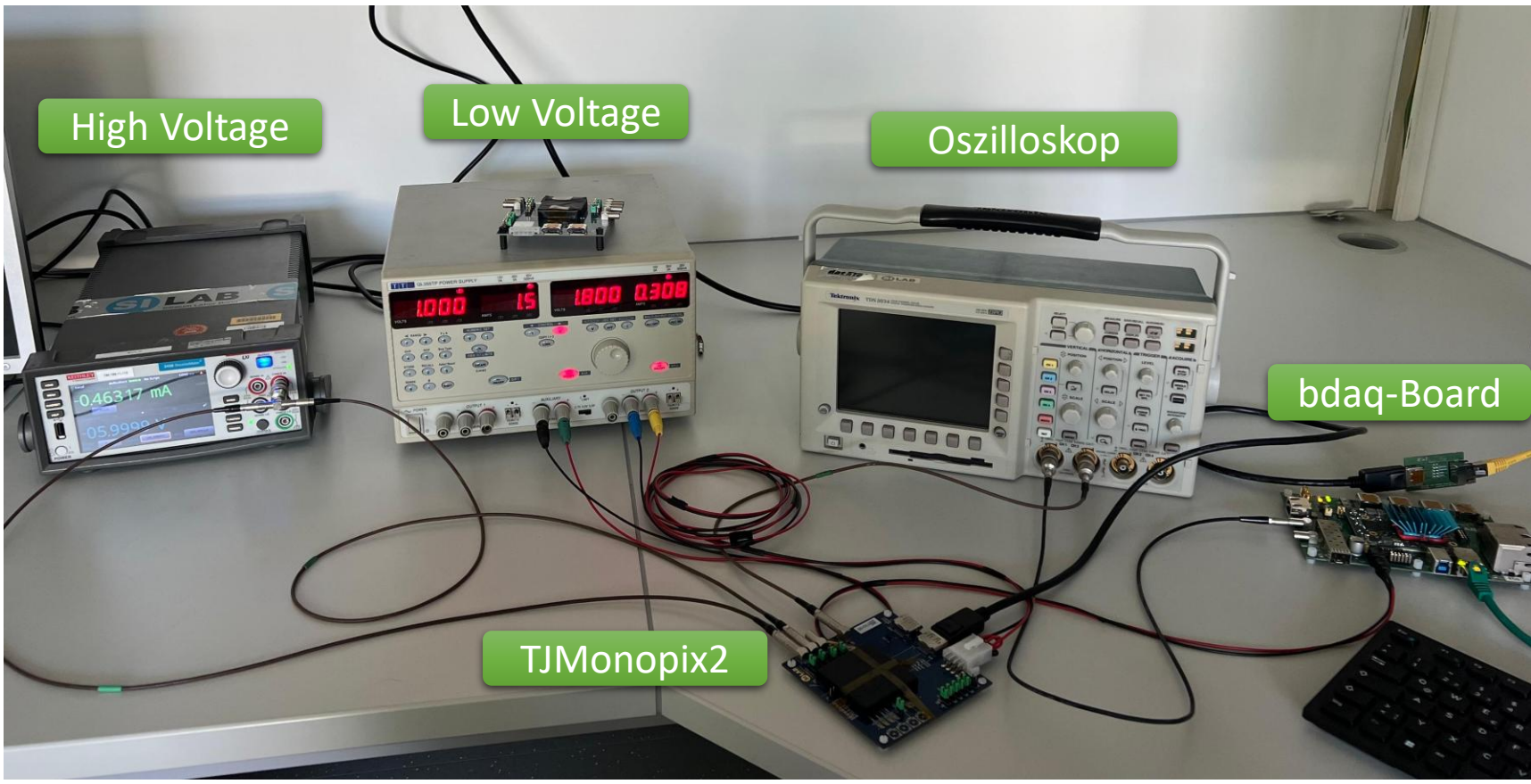
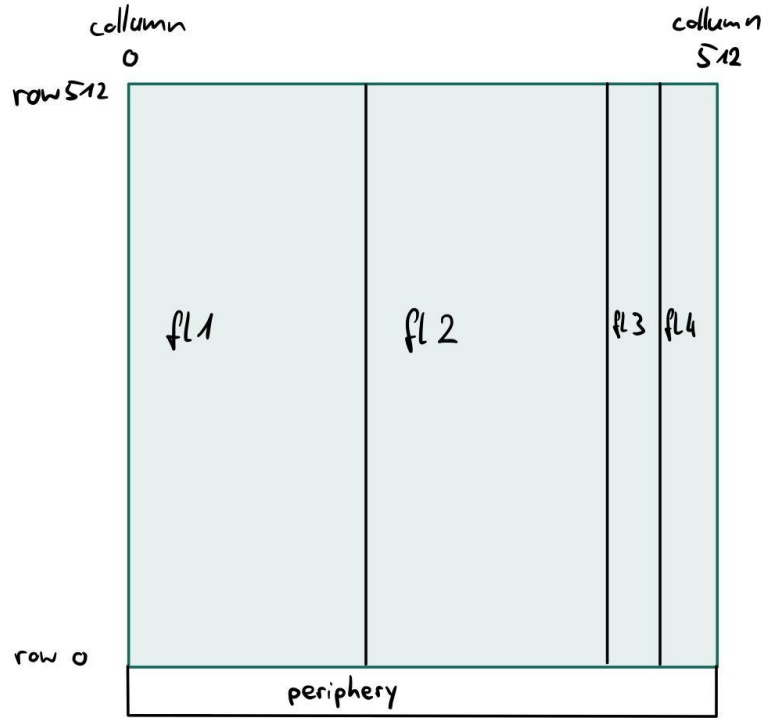
- 4 TJMonopix Chips pro Trackingplane
- TJ gibt HitOr aus, sobald Elektron detektiert wird



- Trigger löst aus, wenn:
    - x-Wert in Plane 2/3/4 bei mindestens 1.99mm/2.3mm/3.1mm/ liegt
    - In Plane 5 kein Elektron detektiert wurde
- $E_e < 100 \text{ MeV}$  in 1T Magnetfeld

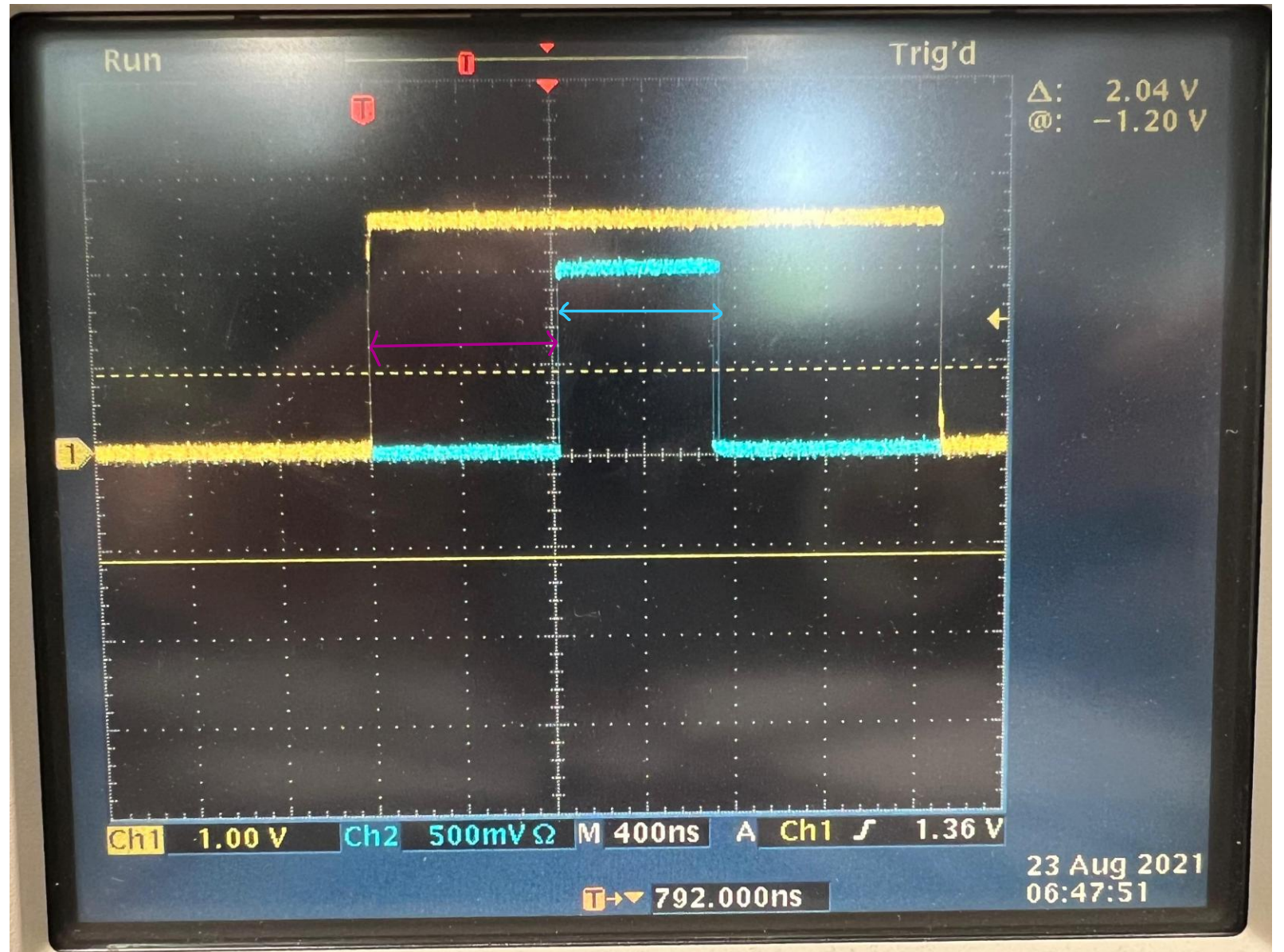
# Timing

- Zwei Anforderungen:
    1. Signal muss schnell genug sein  $\approx 2\text{ns}$
    2. Shaping time  $\approx 2\text{ns}$
  - Bis jetzt gibt es noch keine Chips, die den Anforderungen gerecht werden
- Mein: TJMonopix2 auf timing vermessen



Trigger distance

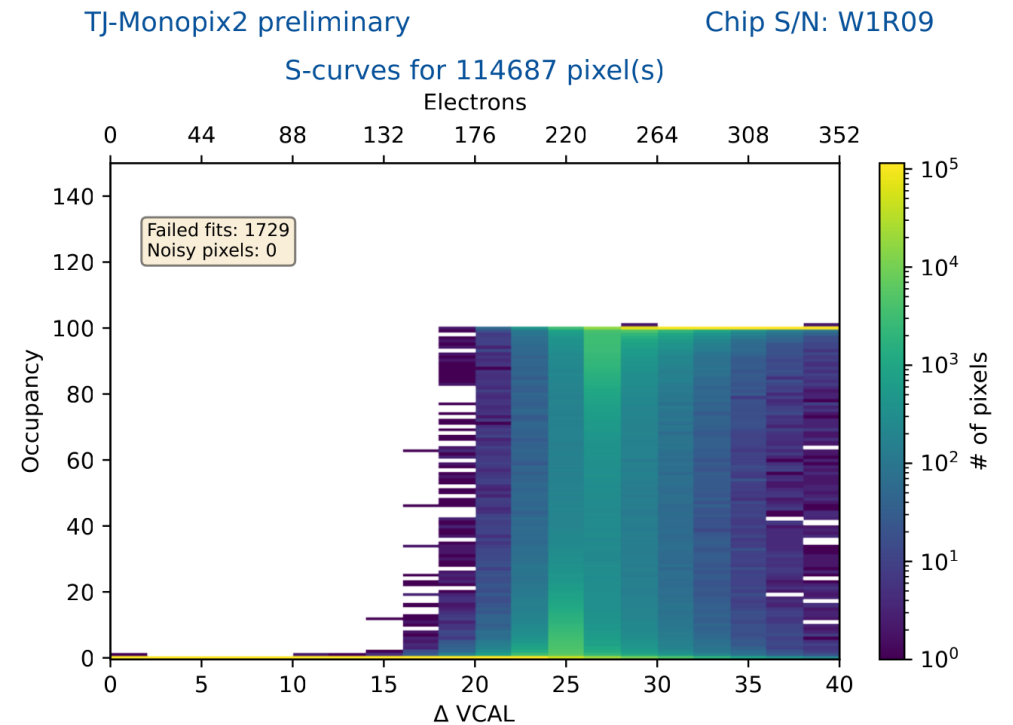
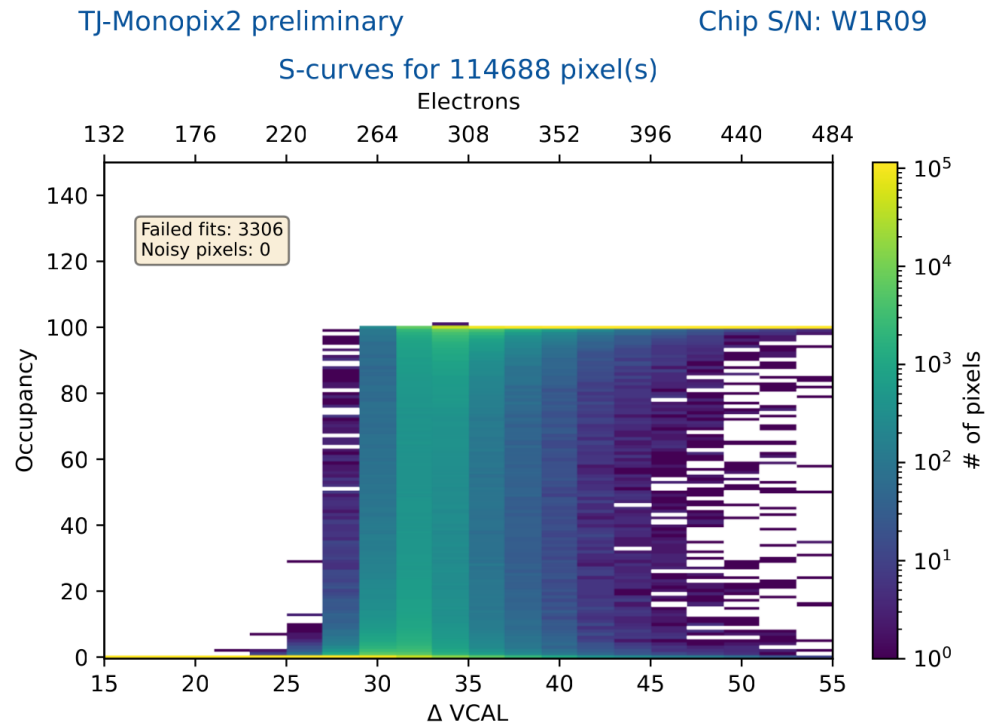
HitOr Breite



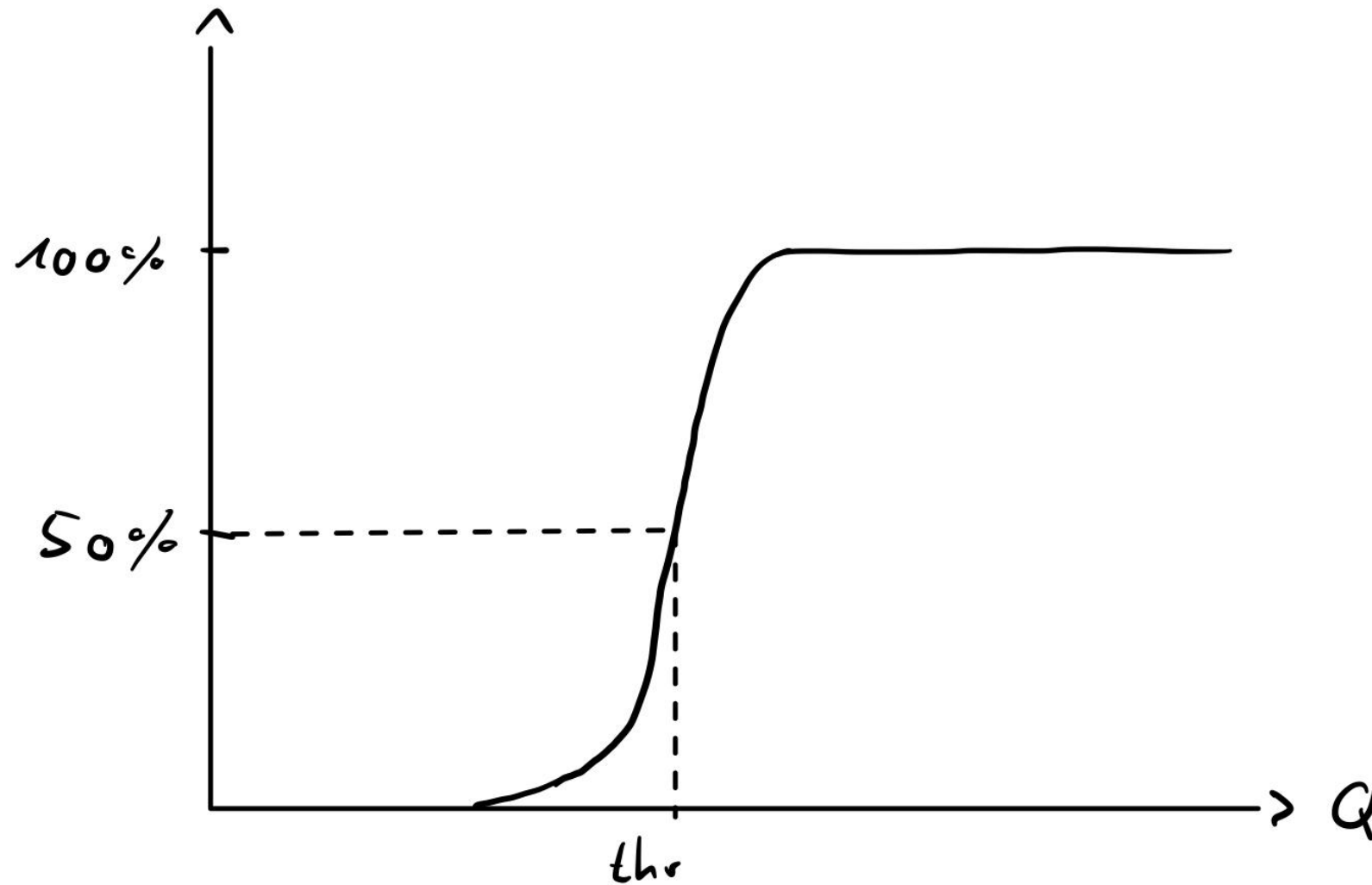
# Threshold Scans

untuned

25 $\Delta$ vcal

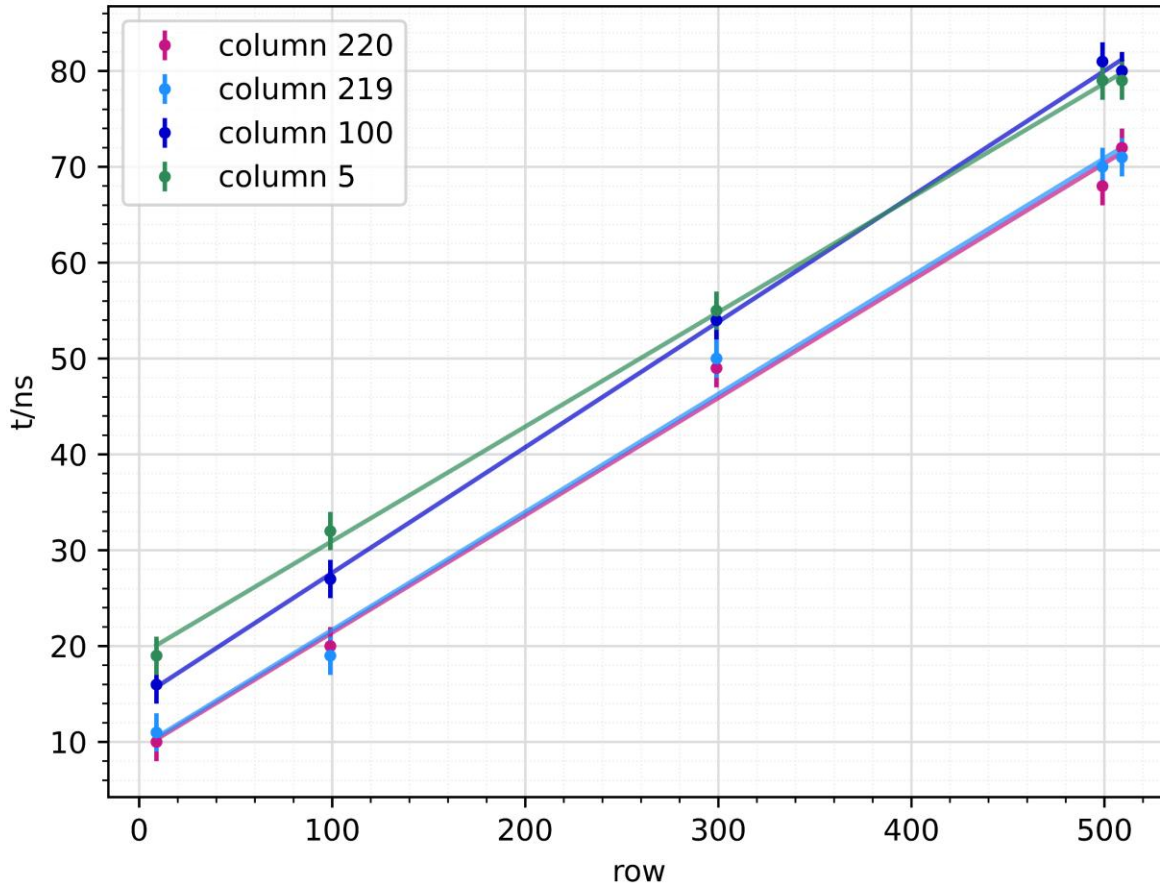


# Tuning

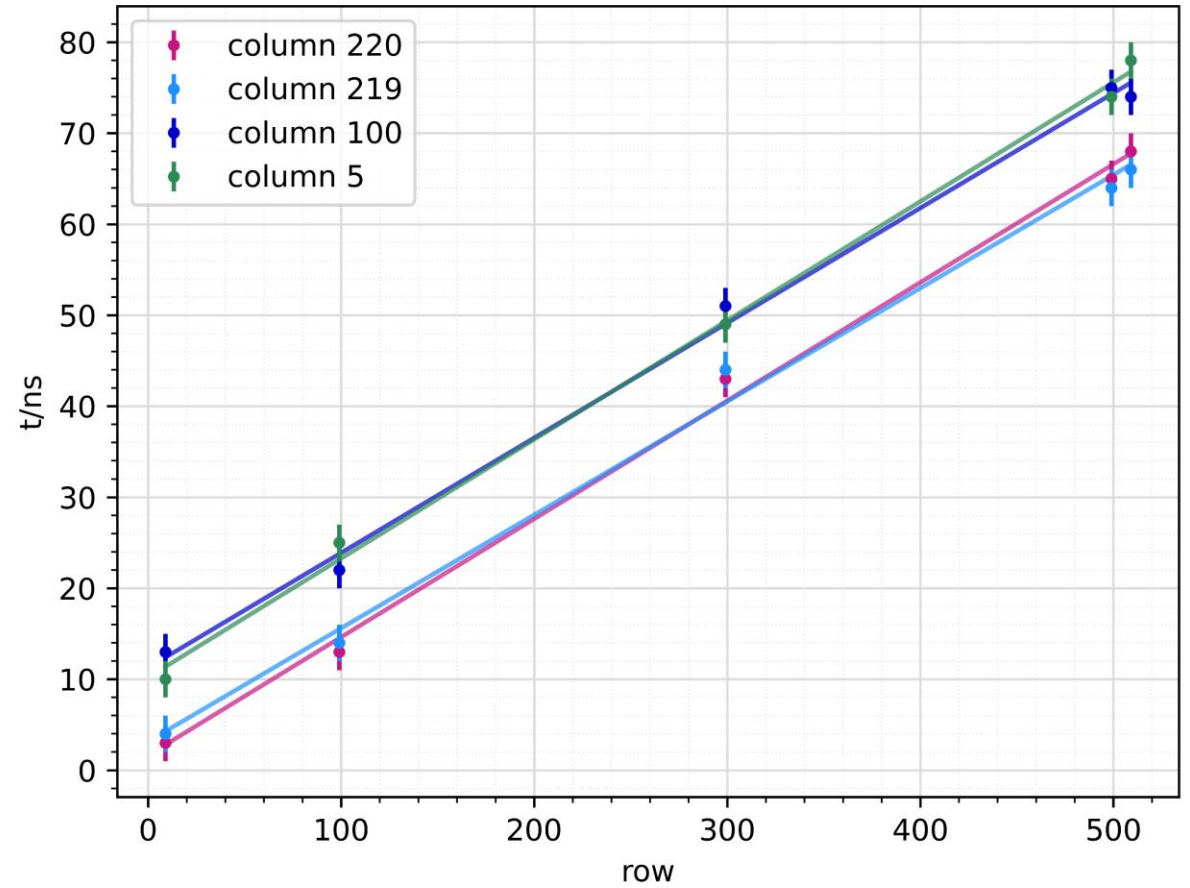


# Time per pixel

before tuning



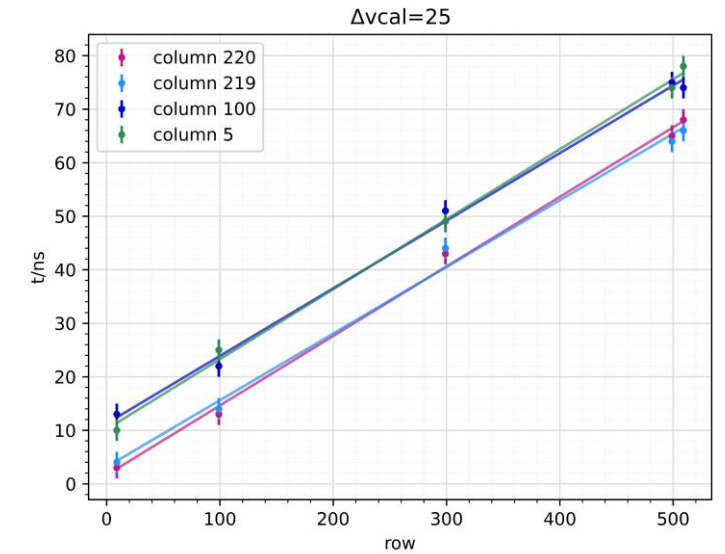
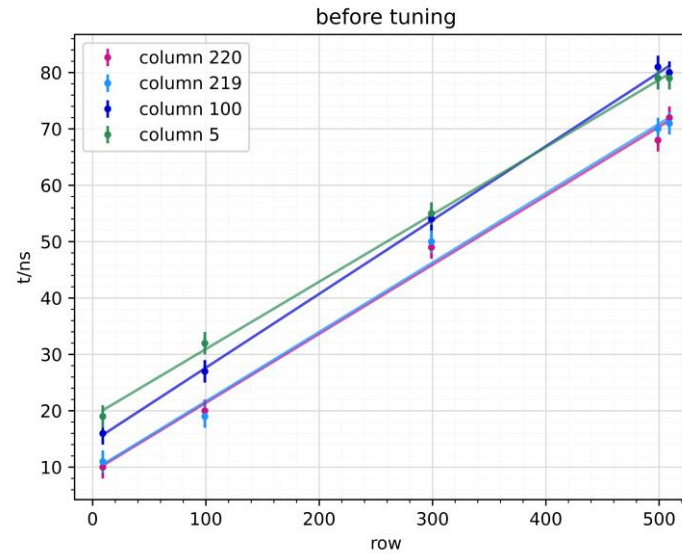
$\Delta v_{cal}=25$



# Fit results

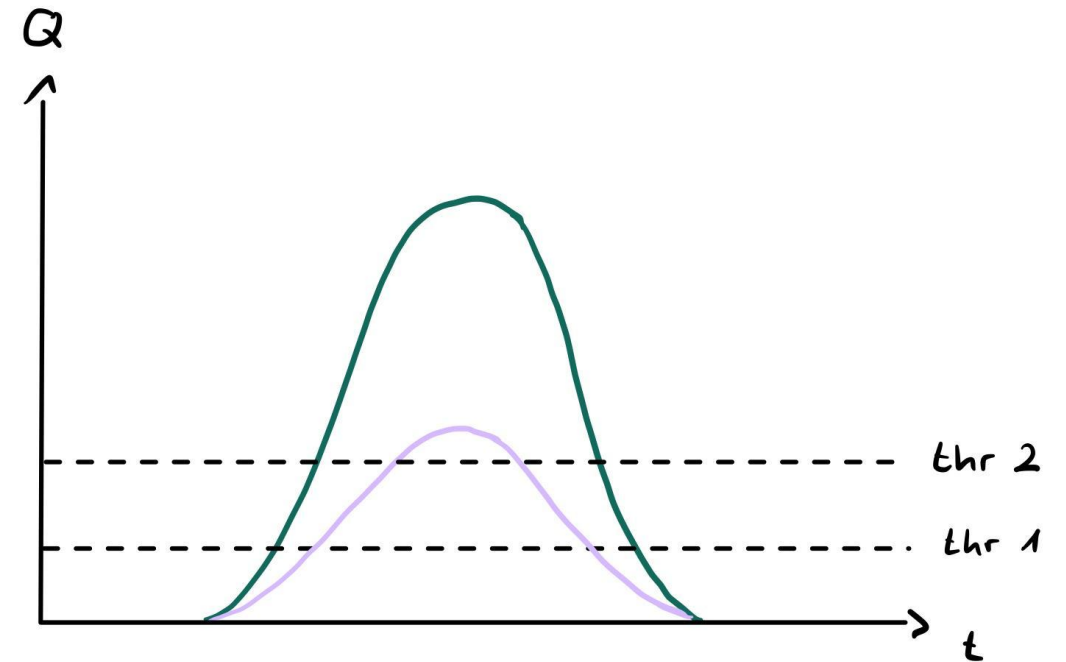
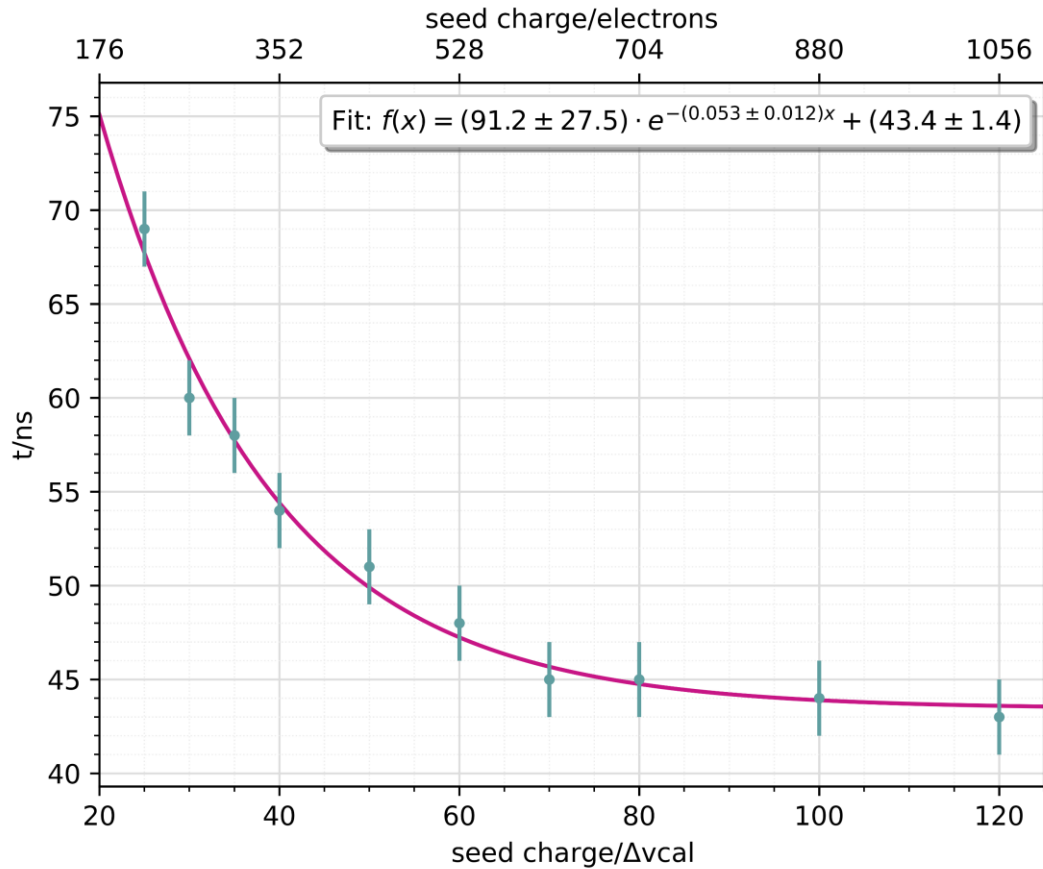
$$y=mx+b$$

$$[b]=ns \quad [m]=ns/\text{pixel}$$



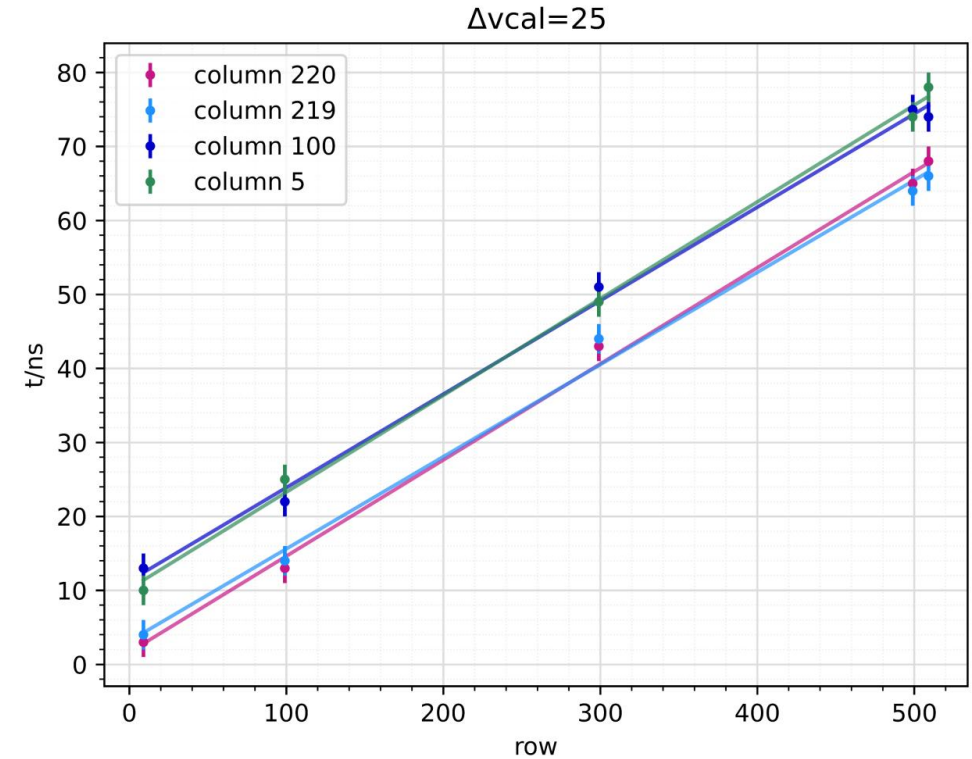
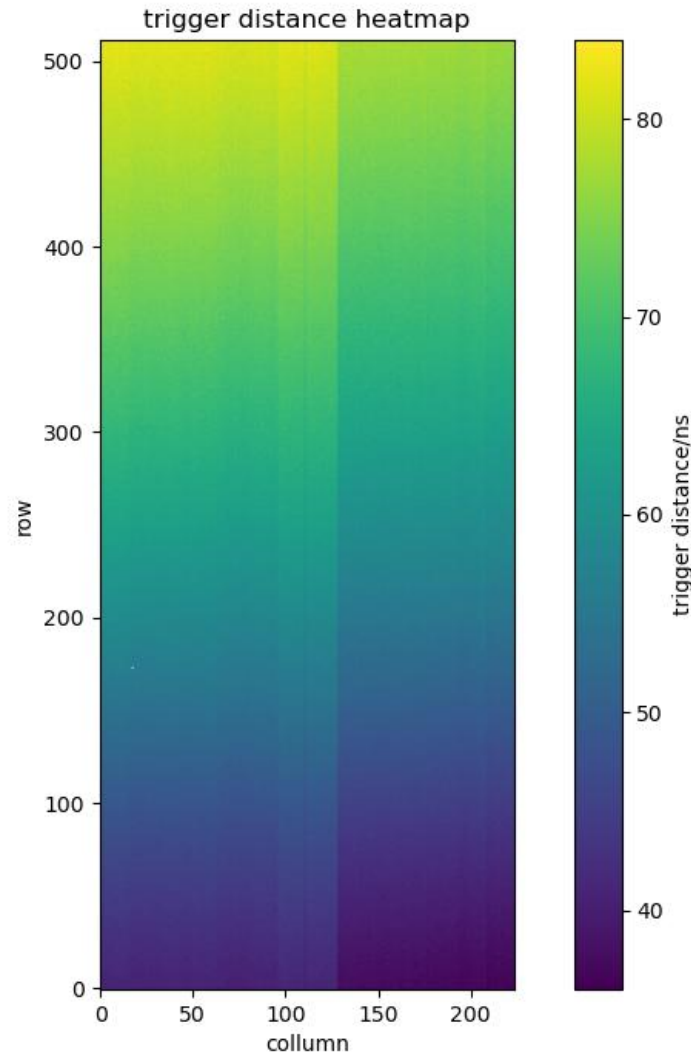
column	$b_{\text{before tuning}}$	$b_{30\text{dvcal}}$	$b_{25\text{dvcal}}$	$m_{\text{before tuning}}$	$m_{30\text{dvcal}}$	$m_{25\text{dvcal}}$
$t_{220}/ns$	9.16+-1.54	3.79+-1.54	1.63+-1.54	0.12+-0.01	0.13+-0.01	0.13+-0.01
$t_{219}/ns$	9.38+-1.54	3.99+-1.54	3.15+-1.54	0.12+-0.01	0.13+-0.01	0.12+-0.01
$t_{100}/ns$	14.38+-1.54	10.43+-1.54	11.26+-1.54	0.13+-0.01	0.13+-0.01	0.13+-0.01
$t_5/ns$	19.01+-1.54	14.35+-1.54	10.20+-1.54	0.12+-0.01	0.13+-0.01	0.13+-0.01

# Timewalk @ thr= 25 $\Delta$ vcal



# TDC-Messungen

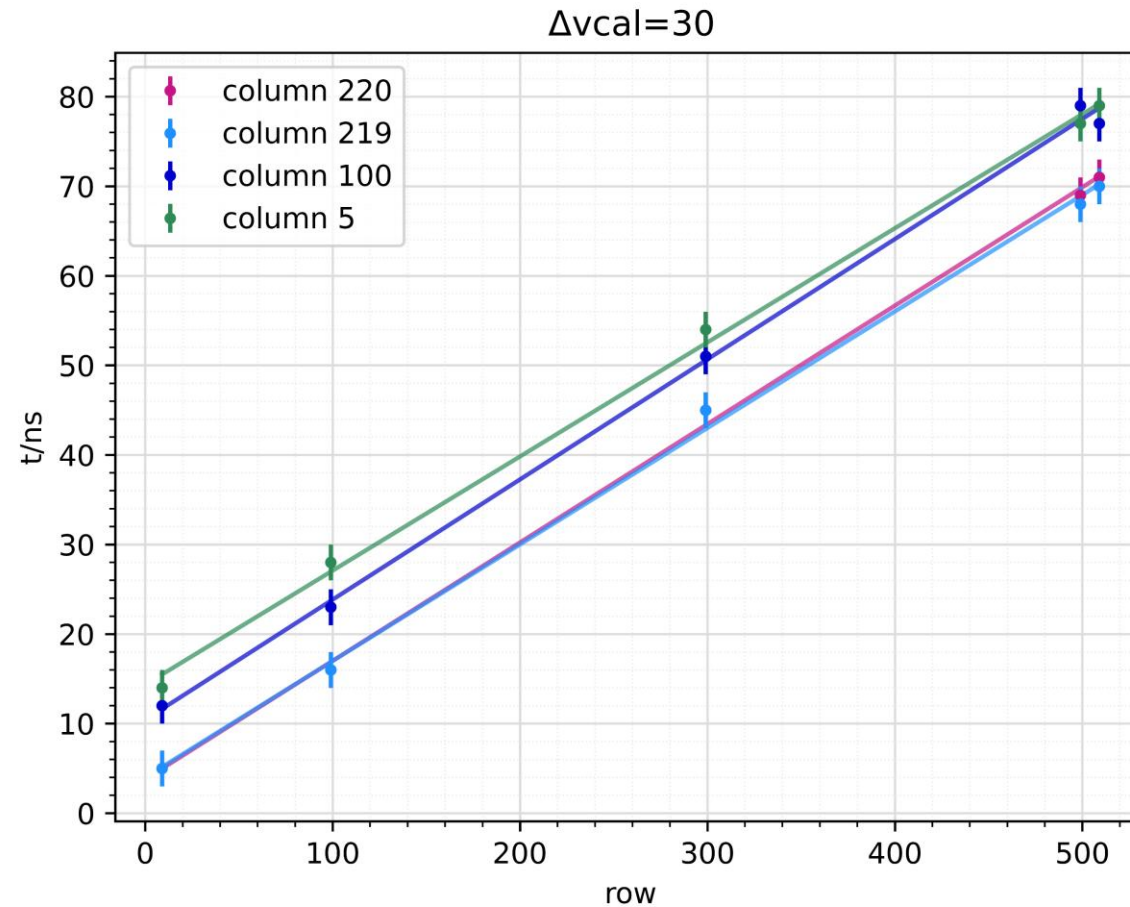
2. Chip, 1. Flavor,  
250 injections,  
thr=  $22\Delta v_{cal}$



1. Chip, 1. Flavor,  
thr=  $25\Delta v_{cal}$

# Backup

- Time per Pixel @  $\Delta v_{\text{cal}}=30$



# HitOr Breite

