

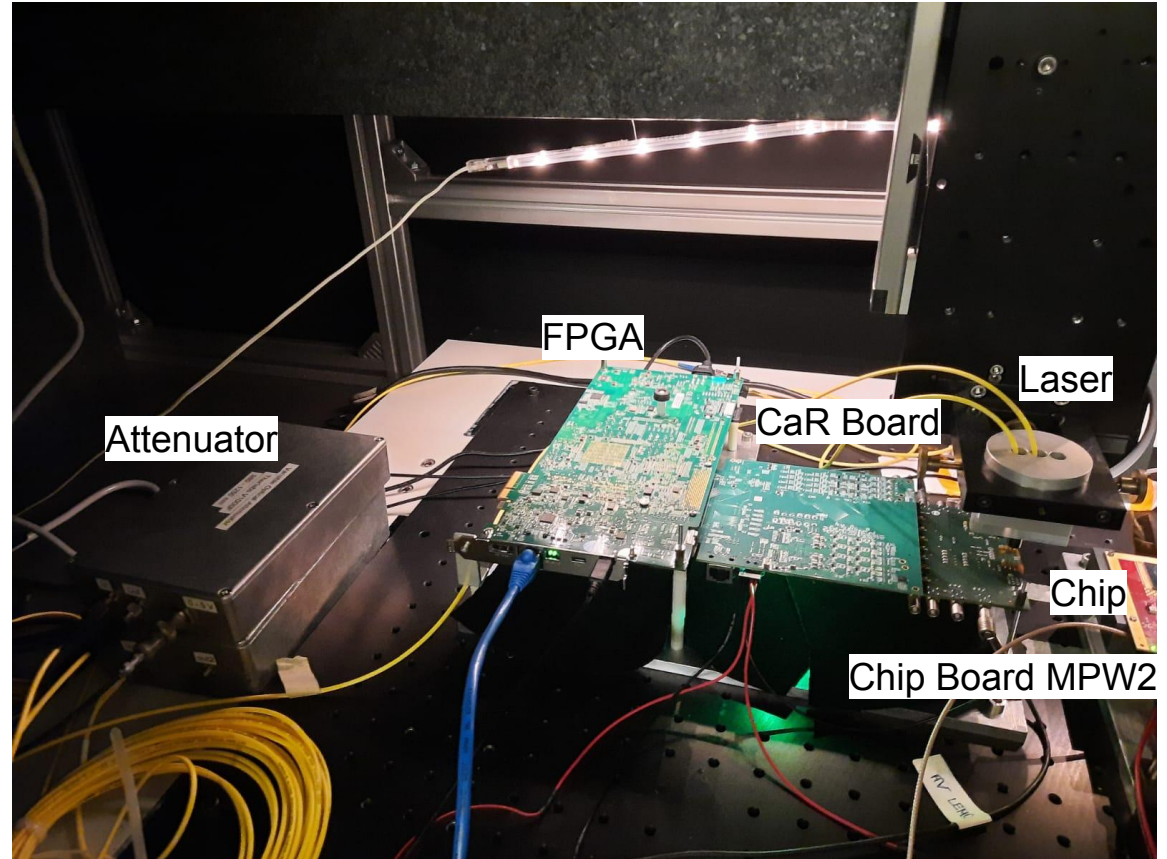
RD50 MPW2

Time Resolution measurements

Douwe Nobels, Uwe Krämer

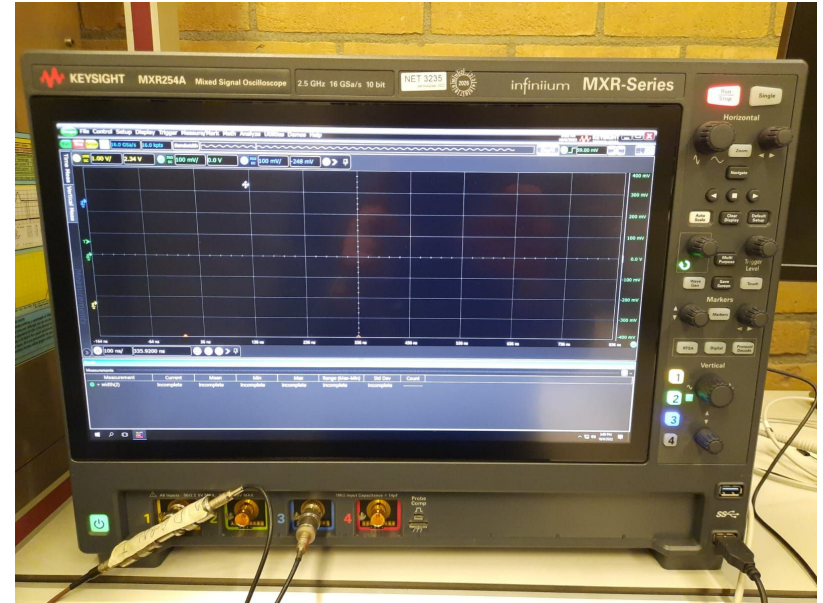
Laser Setup

- 980nm Laser
- HV Bias of -60V
- Laser FWHM $6\mu\text{m}$
- Version 1.4 CaR Board
- Vienna software + firmware



Oscilloscope

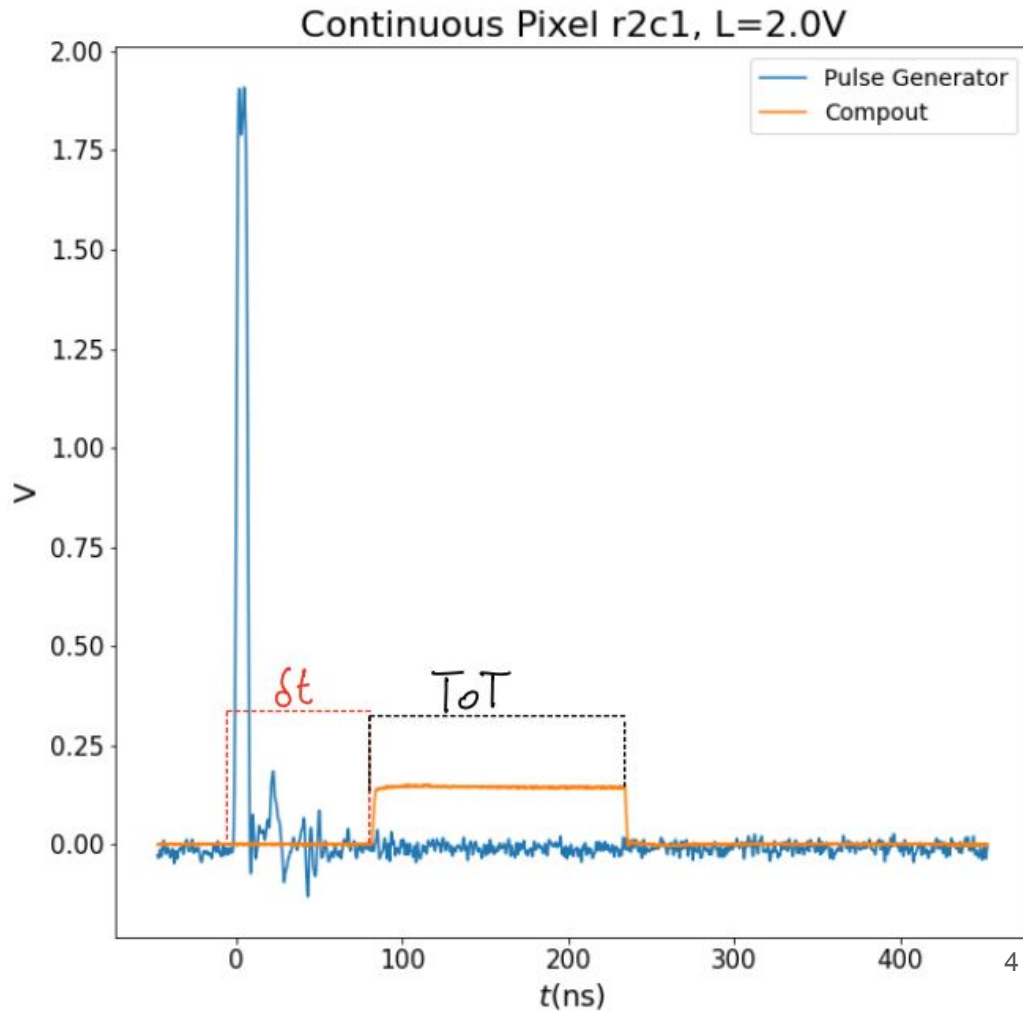
- Keysight MXR254A Infiniium
- 16 GSa/s



Measurements

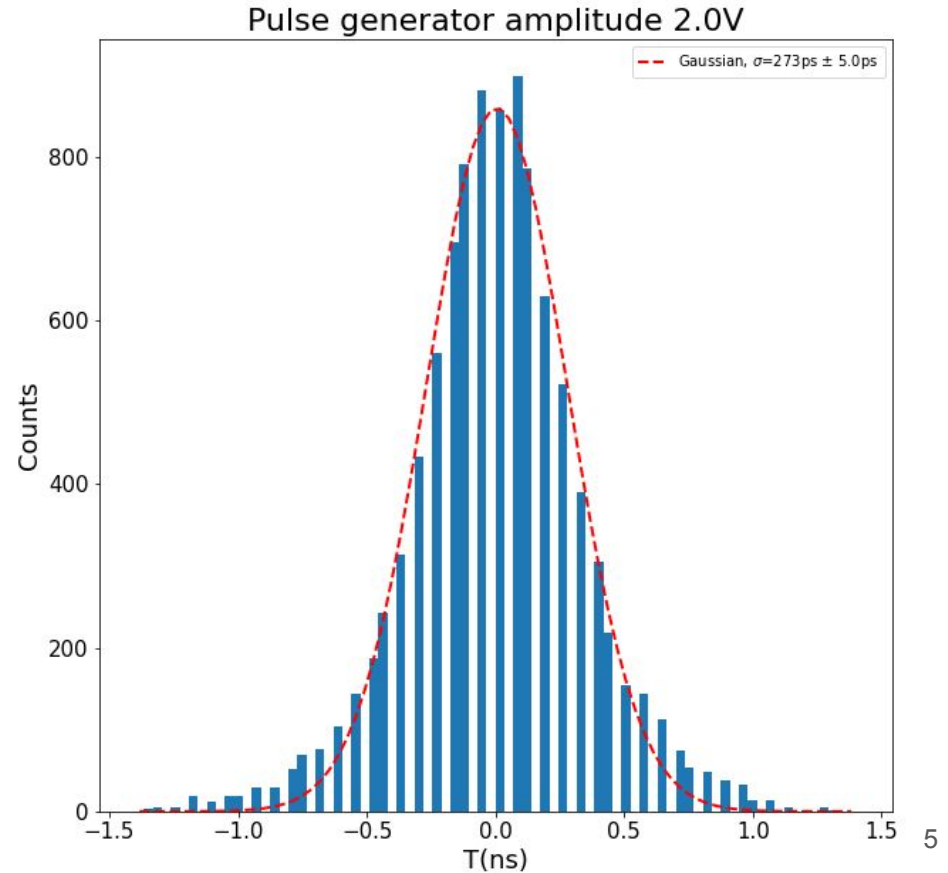
- Raw output oscilloscope
- Laser driven by pulse generator
 - amp. 2.0V-2.5V
- 10,000 measurements each Voltage

- $V_{Th} = 0.97V$
- $BI = 0.9V$
- $V_{NFB_{Cont}} = 0.7555V$
- $V_{PFB_{Sw}} = 1.060V$



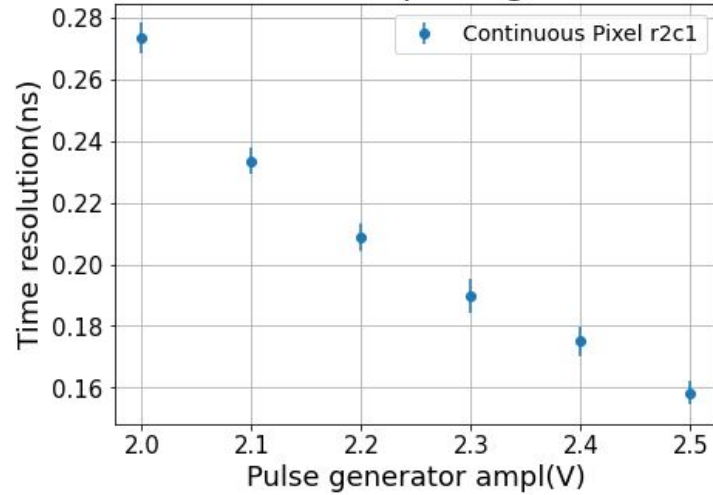
Measurements: δt

- Continuous pixel r2c1
- $\sigma = 273\text{ps} \mp 5.0\text{ps}$

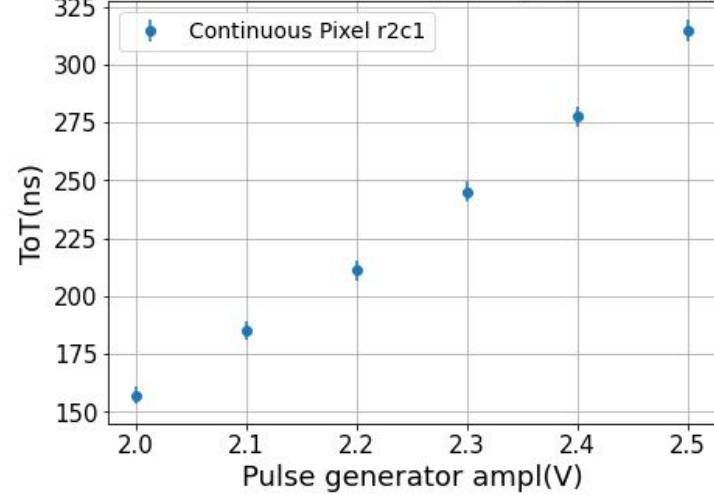


Measurements: Time resolution and ToT

Time Resolution vs laser pulse generator amplitude

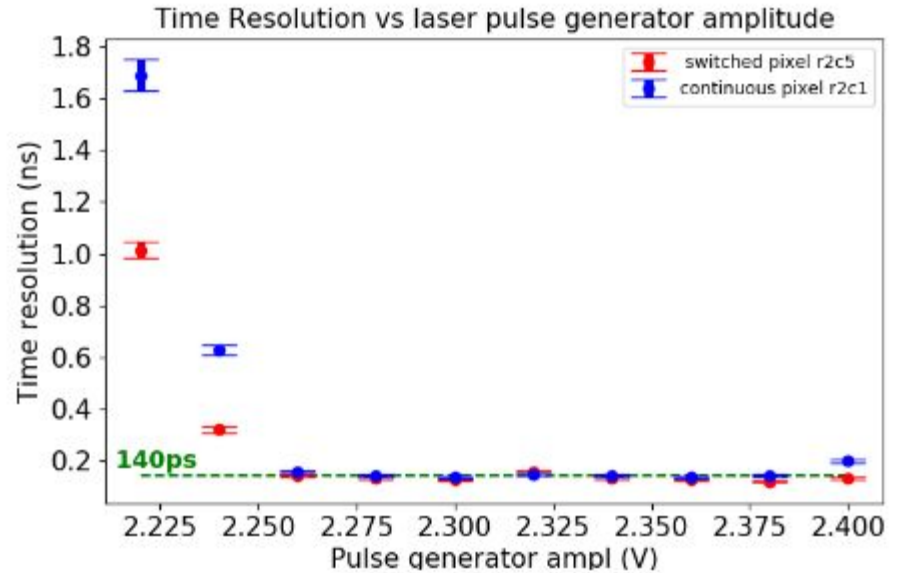


Time over Threshold vs laser pulse generator amplitude



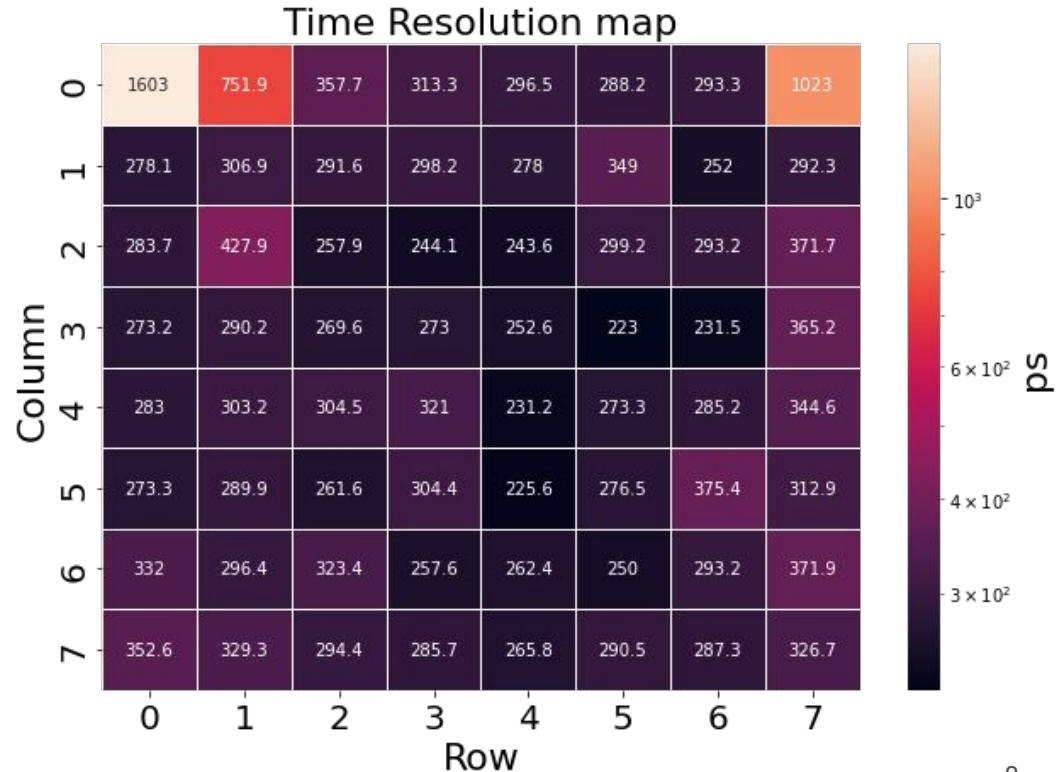
Time resolution measurement by Christina

- Lower time resolution
- Asymptotic



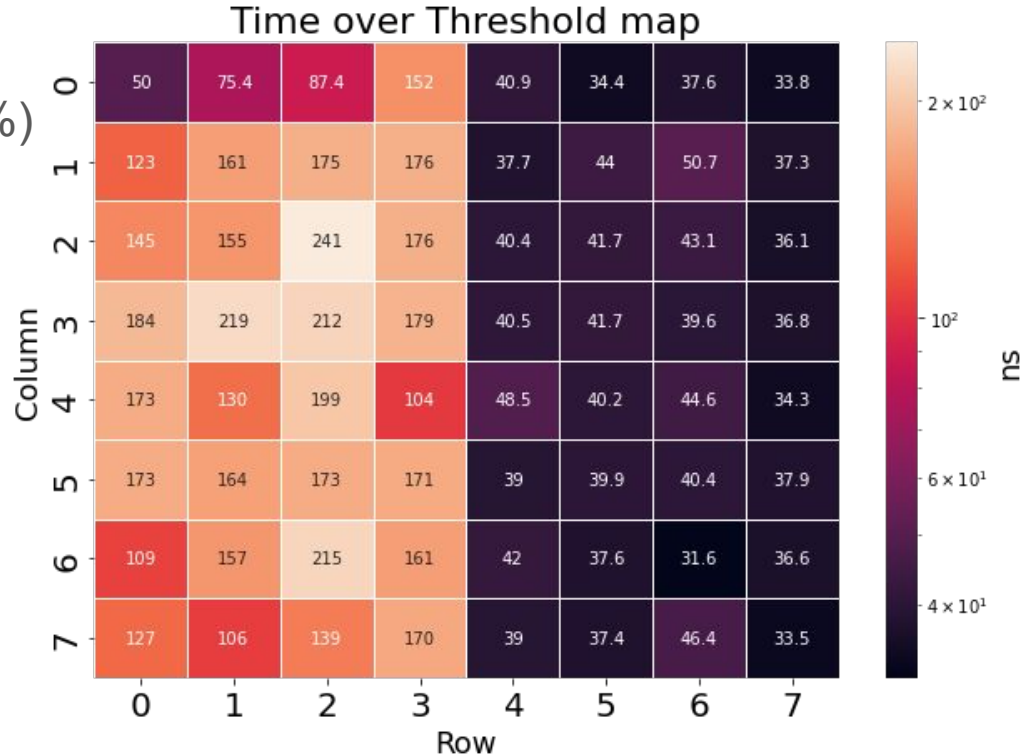
Measurements: Time resolution for All Pixels

- Laser amplitude of 2.3V
- Attenuator 2.0V(reduction of 75%)
- 1.600 measurements per pixel
- Corner points are outliers
- No big difference between switched and continuous pixels



Measurements: ToT for All Pixels

- Laser amplitude of 2.3V
- Attenuator 2.0V(reduction of 75%)
- 1.600 measurements per pixel
- Clear difference between switched and continuous pixels



Summary And Outlook

- Time resolution around 300 ps for 2.3V with 2.0V attenuator
- Clear difference in ToT for switched and continuous pixels

- Measuring corner points separately
- Calibrations

Backup Slides

