



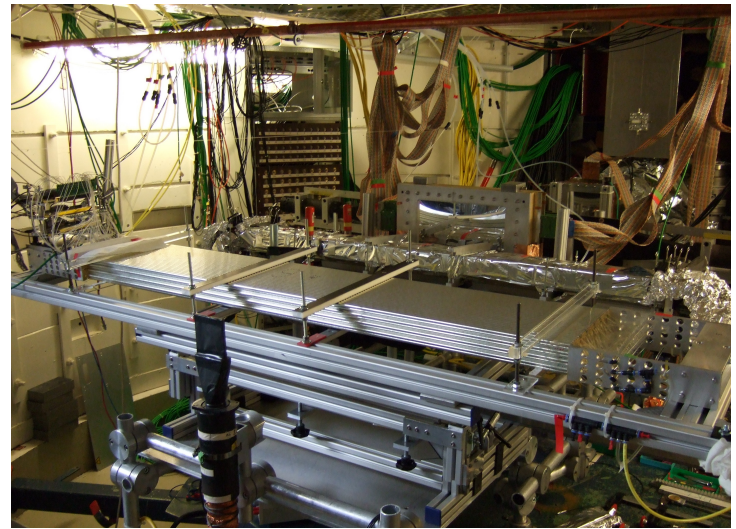
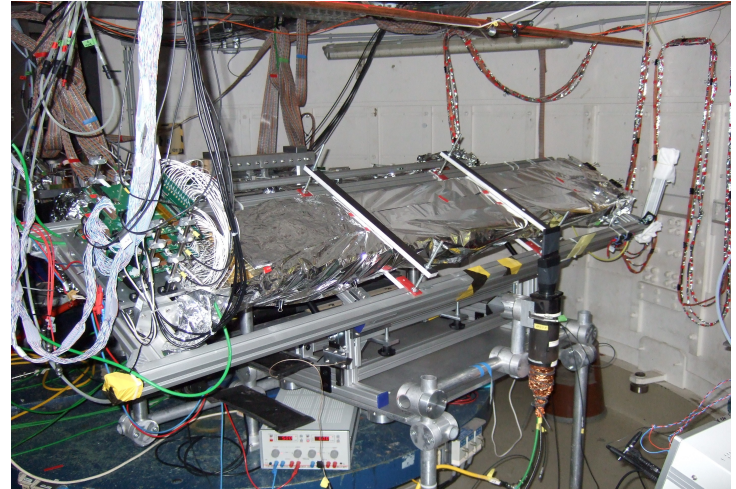
STT December Beam Time Overview

Content

- Prototype Setup Asic TRBv3 readout
- Beam Overview
- Data Analysis
- Tracking (preliminary)

Prototype Setup

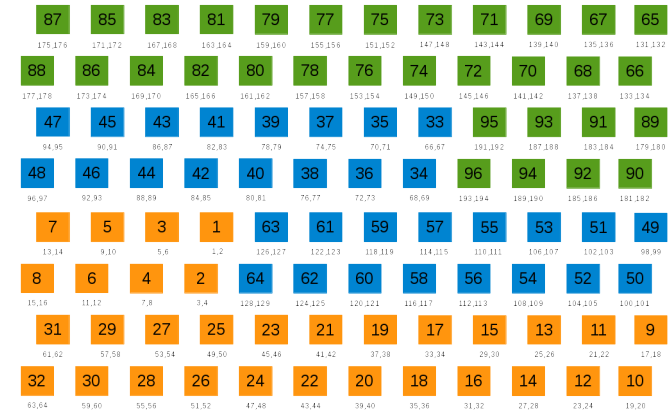
- In the Big Karl Area
- Some structural changes have been made
- Straw-map was optimized for beam time (recabling)
- Ar/CO₂ (9:1) 2 bar absolute
- 3 triggers available (S1,S2,S5)
- Beam profiling possible through gem and straw detectors



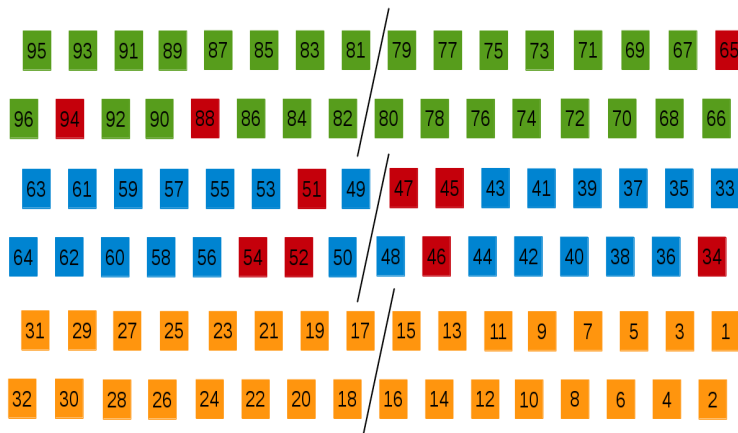
Prototype Setup

Channel failures:

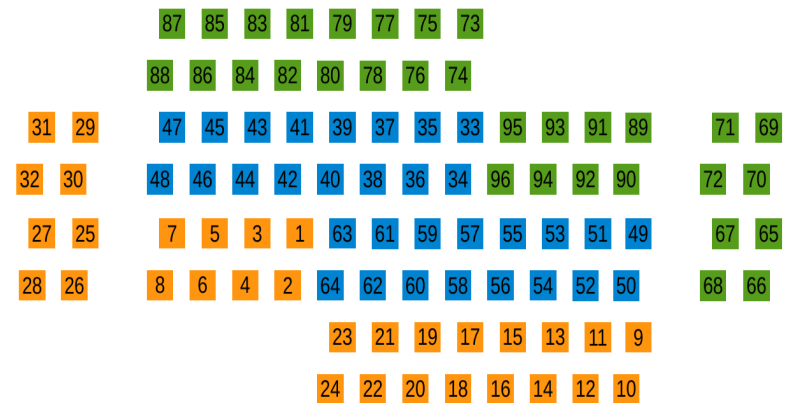
- Channel 51 defect straw
- 6 channels no signal at asic output
- 2 channels have inverted leading and trailing edge times



July Beam Setup



December Beam Setup

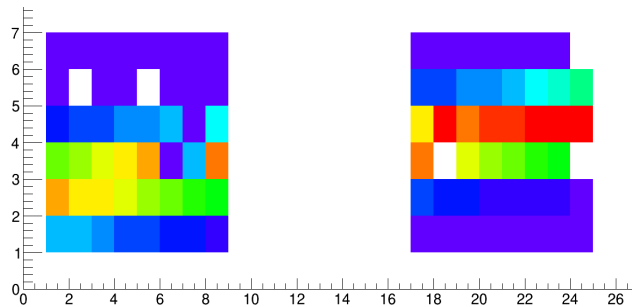


October Beam Setup

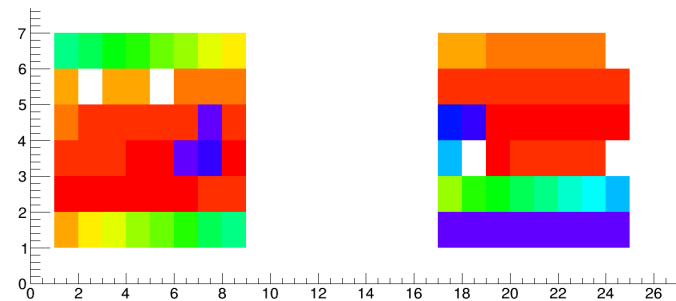
Beam is always coming from the right side

Beam Overview

- Proton beam with 2.0 - 1.3 - 1.0 - 0.8 GeV/c
- Different beam intensity measurements ranging from ~200 kHz to ~80kHz
- Different beam cross-sections measurements
- Data was taken at 1750V (3×10^4), 1800V (5×10^4), 1850V (9×10^4), 1900V (13×10^4)



Vertically narrow beam



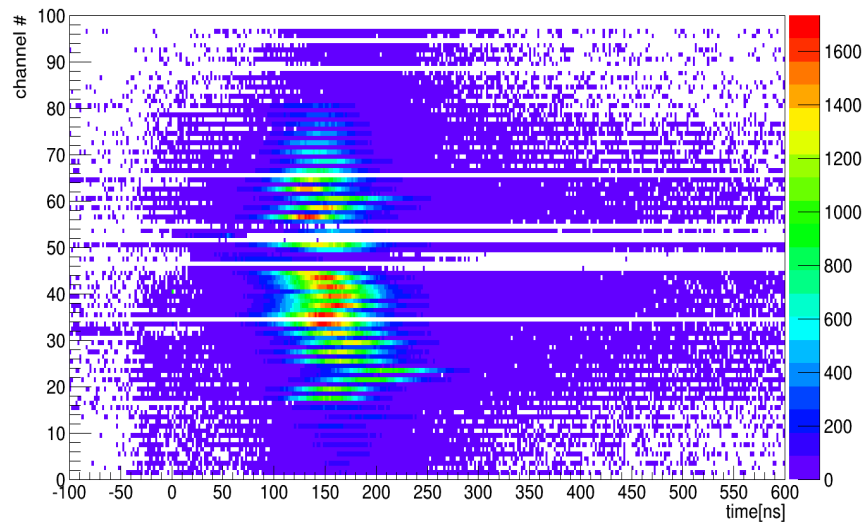
Vertically wide beam

Beam is coming from the right side

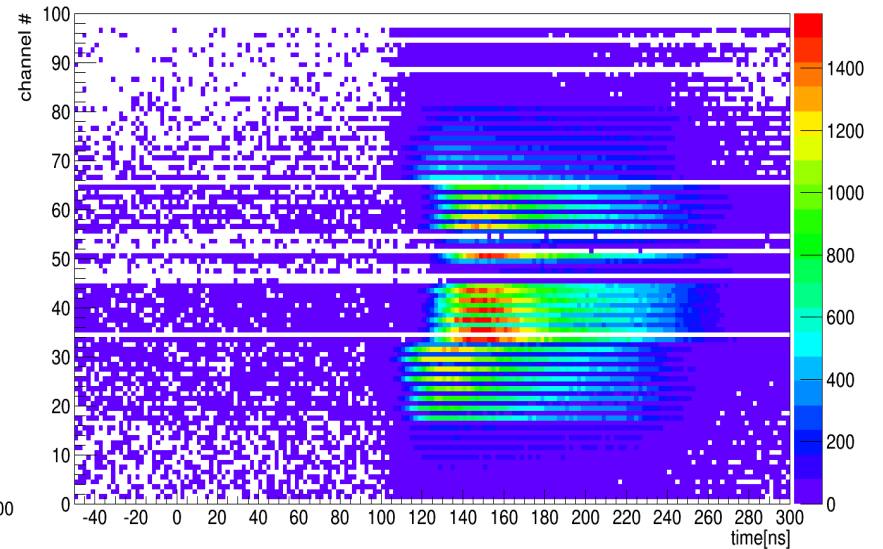
Data Analysis

Raw time data without correction for 1800V

TOT time vs channel /wo correction



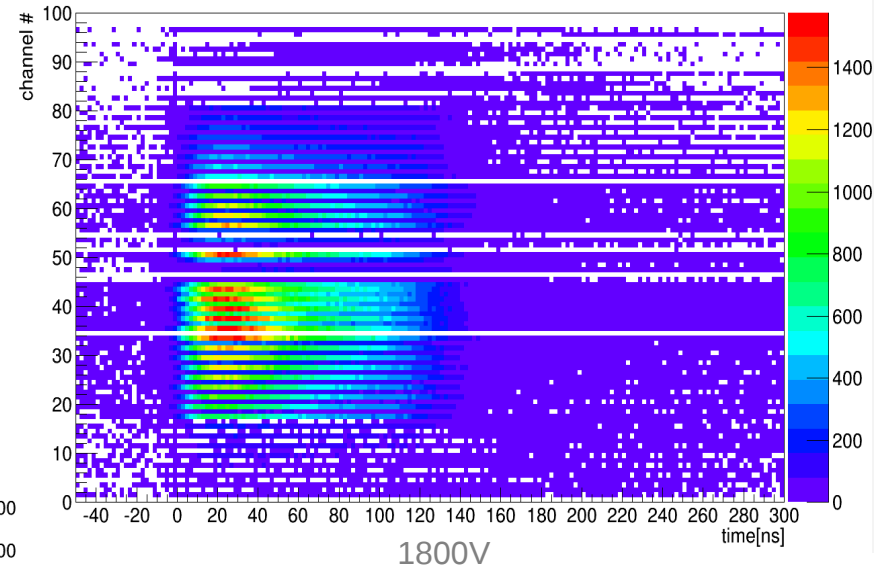
drift time vs channel /wo correction



Data Analysis

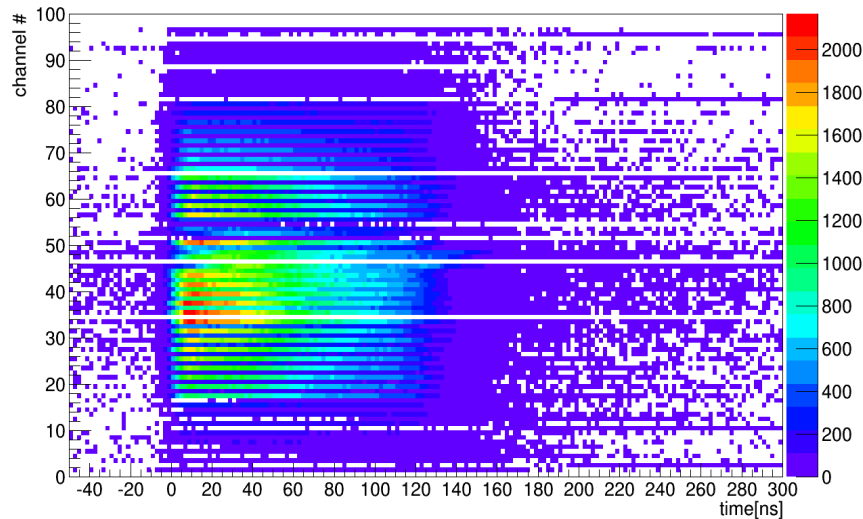
- 800 MeV/c
- 1800V - 1900V
- Vertically narrow beam $\sim 2\text{cm}$

drift time vs channel /w correction



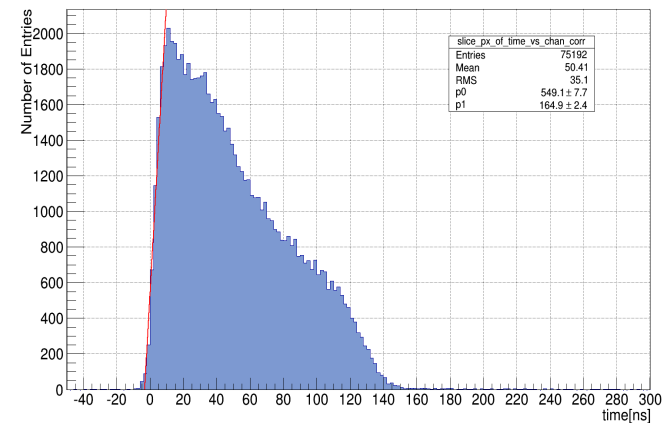
1800V

drift time vs channel /w correction



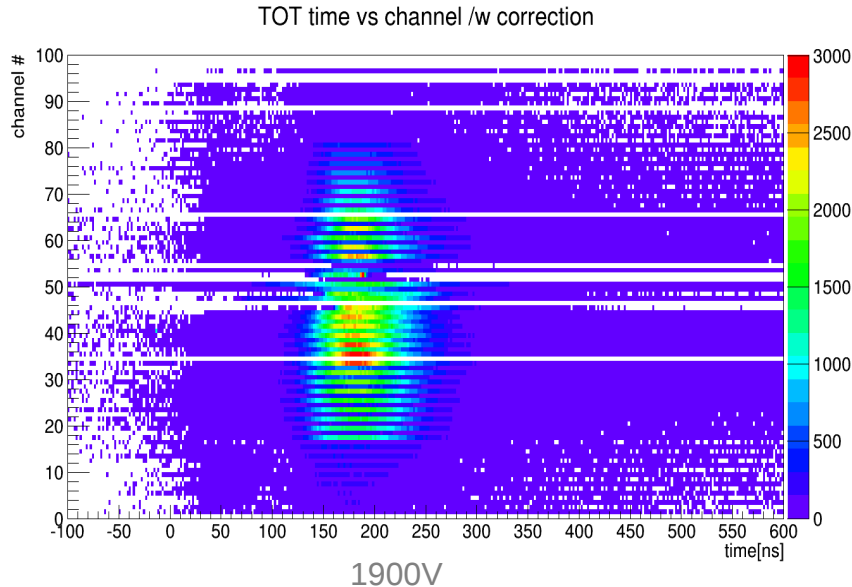
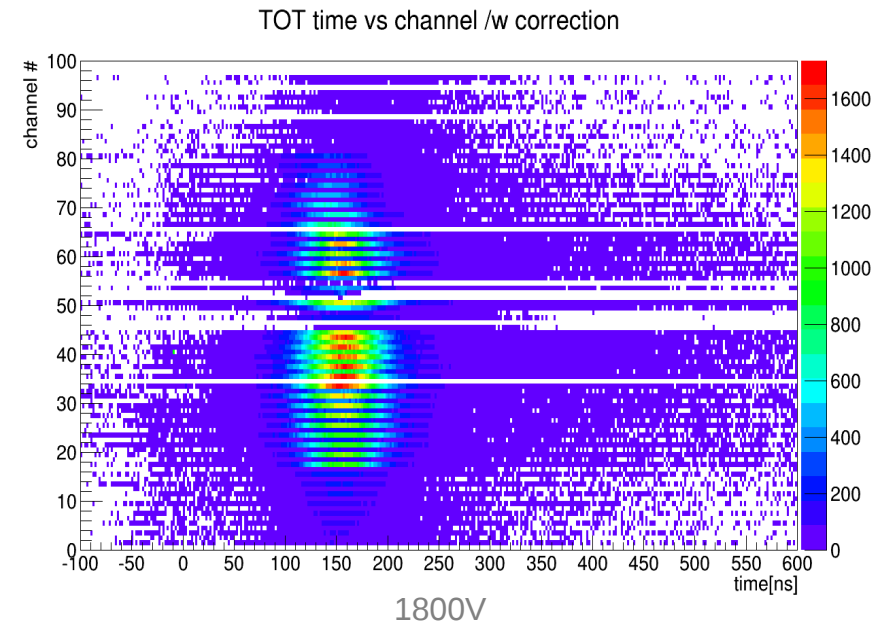
1900V

ProjectionX of biny=40



Data Analysis

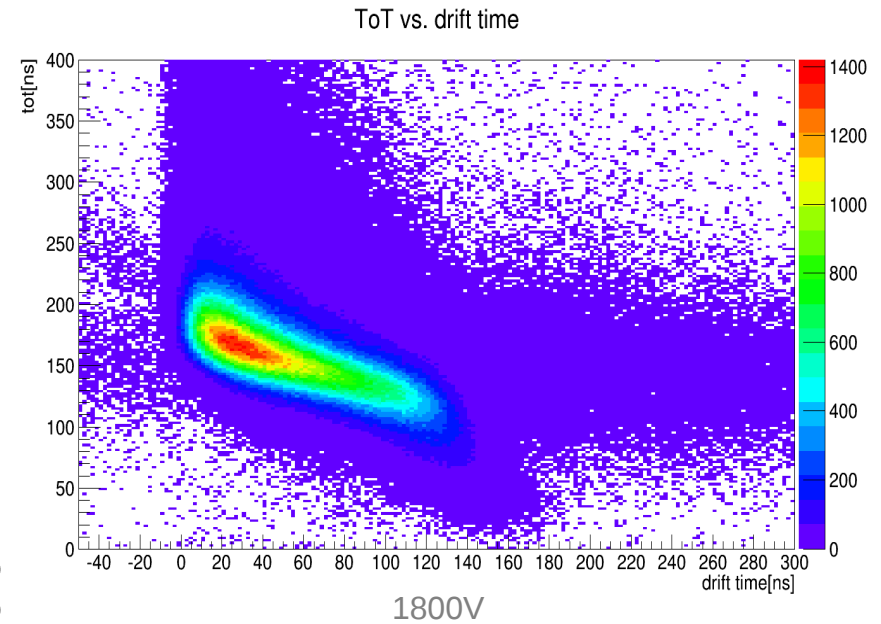
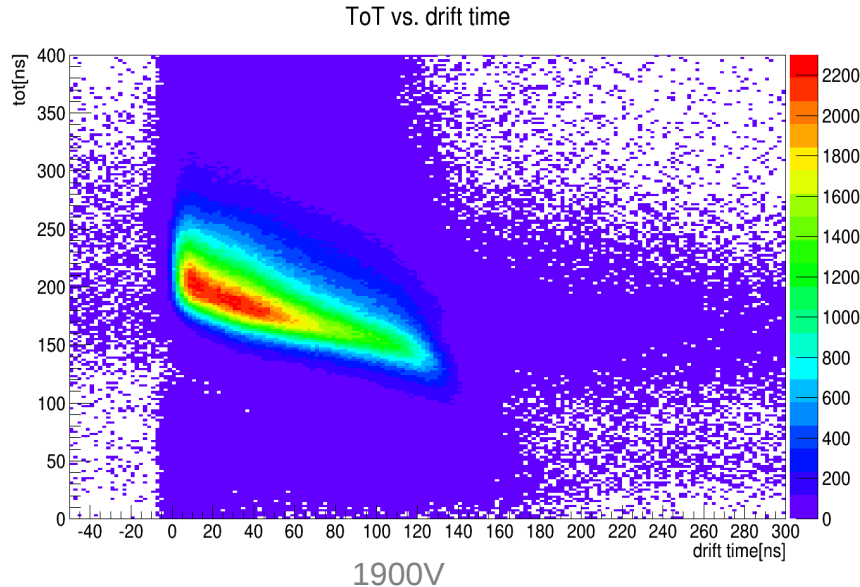
- Inaccuracies due to low statistics
- The structure in the middle is caused by the defect channels



Data Analysis

Only one leg is observed ending at around 140 ns

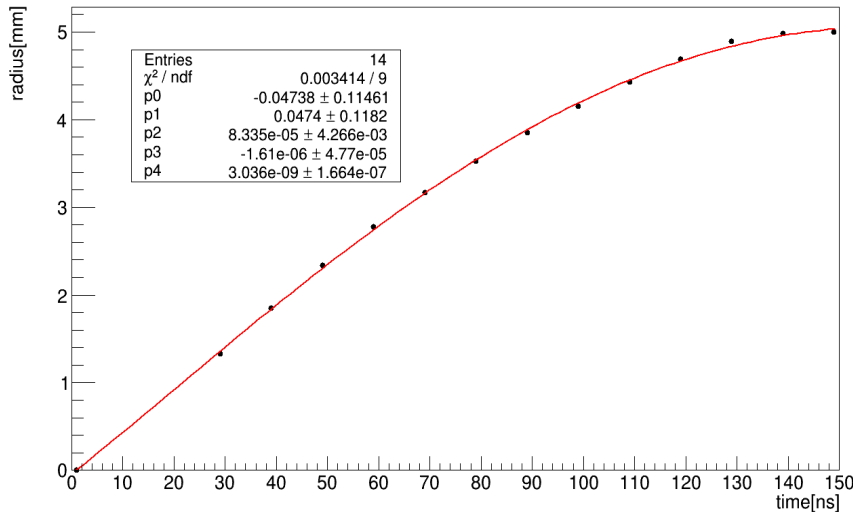
All beam data has undergone fast analysis (100k – 250k events)



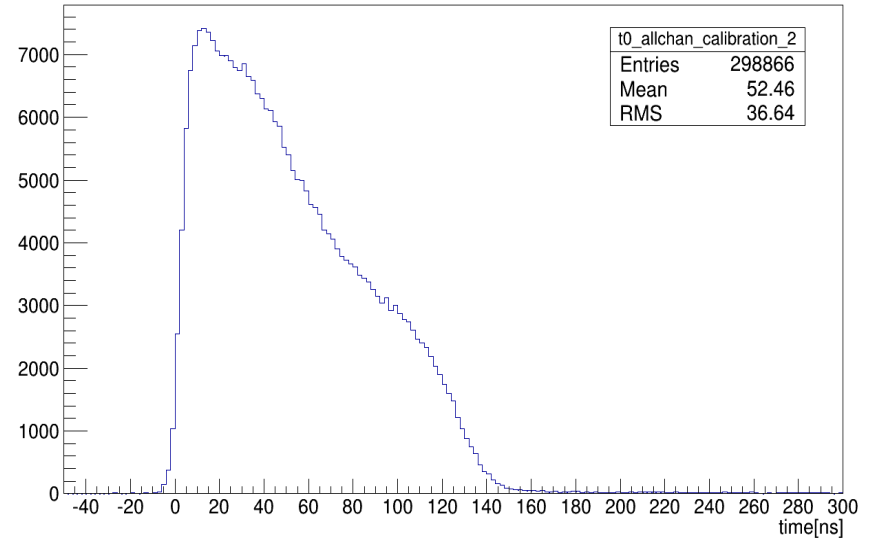
Tracking

- Caution: $r(t)$ curve is preliminary
- Done using 3 straws
- 150 ns is set as t_{max}

Isochrone radius vs. drift time



t_0 calibration of selected channels[39,40,42]

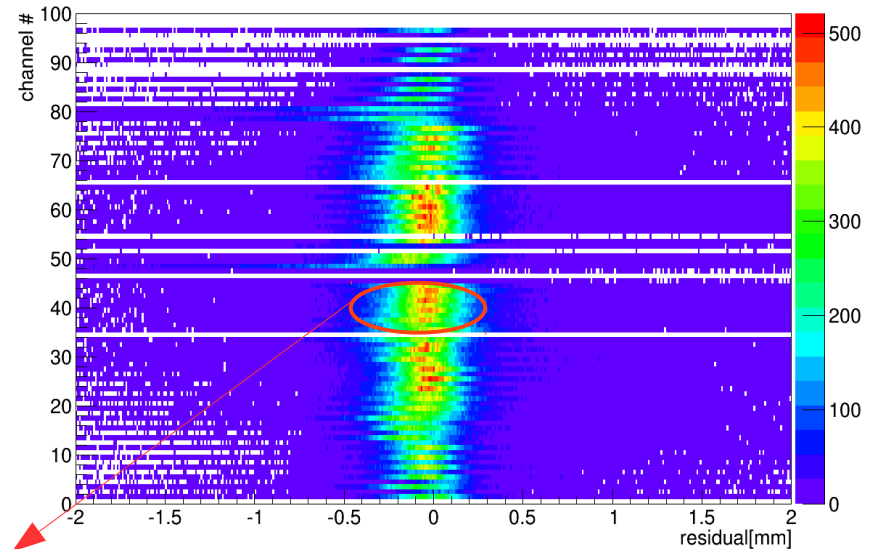


$$r_i = r(t_{drift}^i) = \frac{\sum_{i=0}^{t_i} N_i}{N} \times (R_{tube} - R_{min}) + R_{min}$$

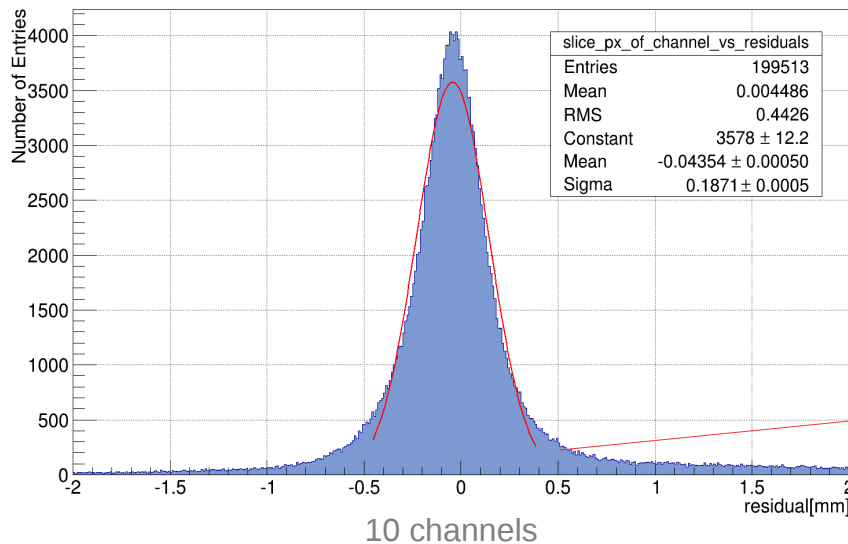
Tracking

- The very top and bottom layers were not hit
- All other channels have a residual ≤ 200 microns
- Only time cut used

Channel vs Residuals



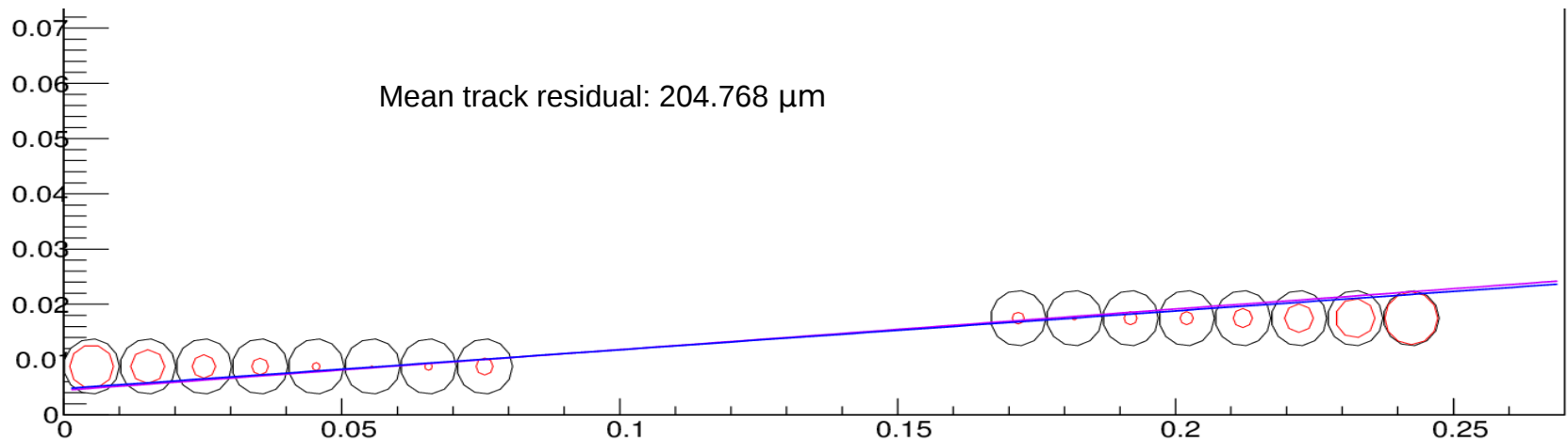
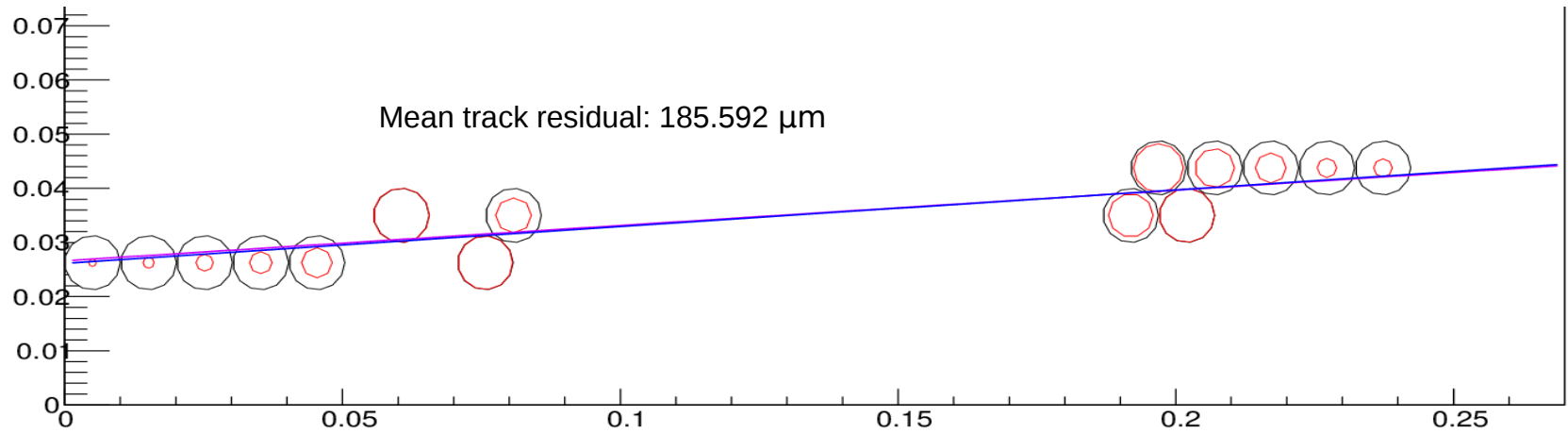
ProjectionX of biny=[36,45]



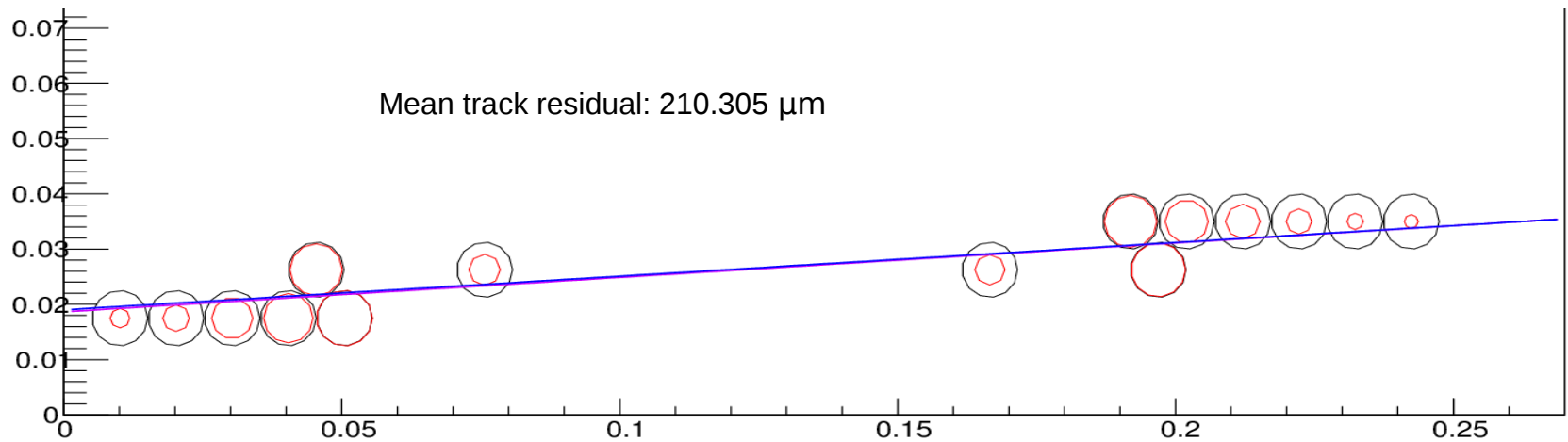
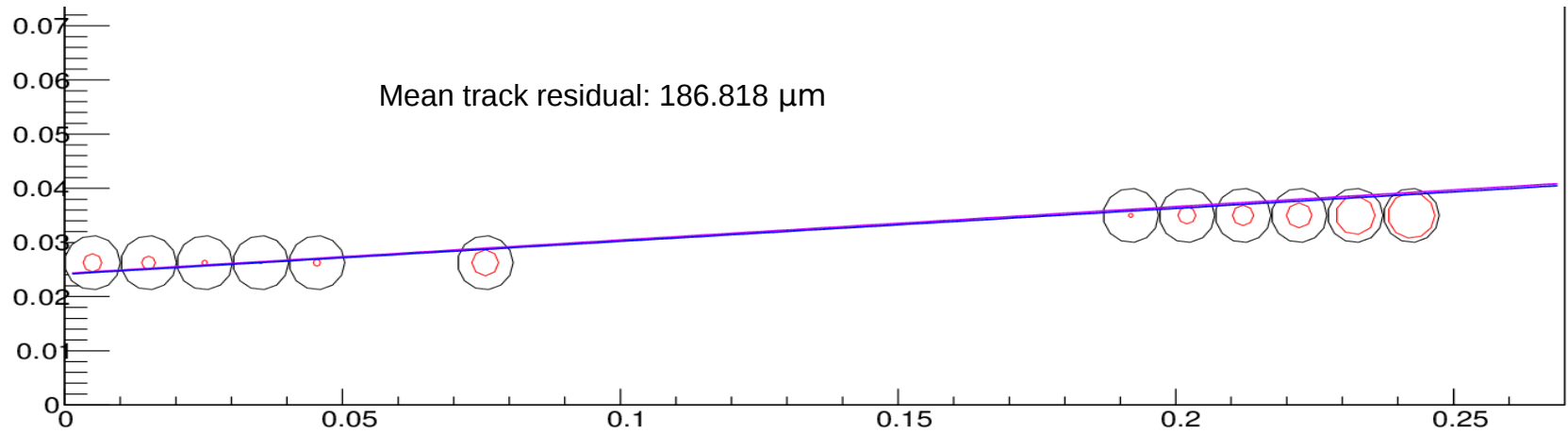
No hit filtering

Background includes delta electrons, multiple tracks, outlier hits ...

Tracking



Tracking



Thank You For Listening

