# ARCADIA FNAL meeting

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# **TB analysis:** status

Assumptions done for the tracking:

- just time coincidence, NO spatial check of any kind
- consider events with just one clz per plane

What's new

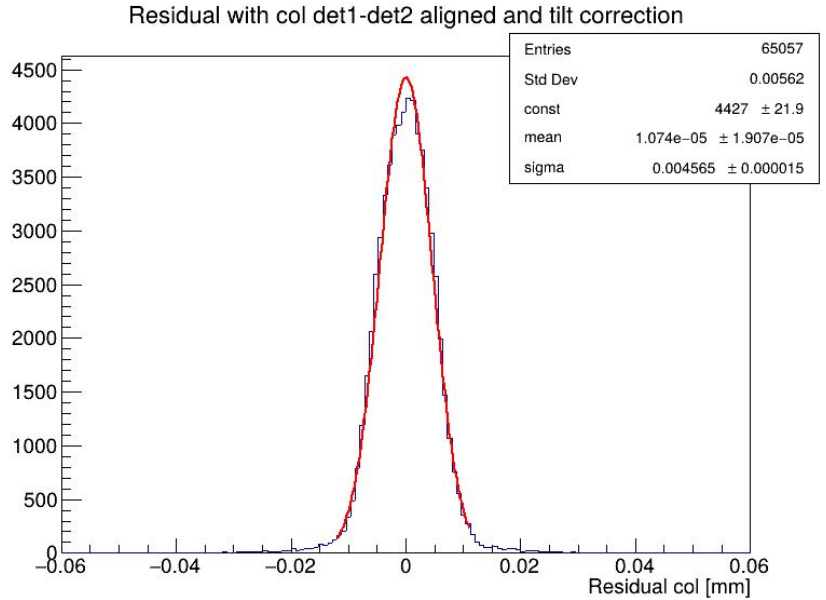
**Tracking**

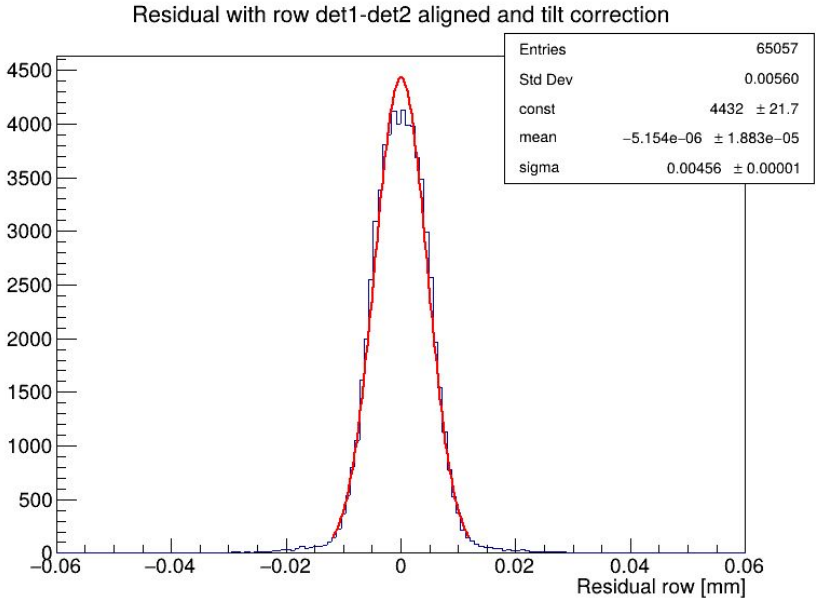
- Fixed kinky clz removal
- Study on residual histograms tails
- Study of resolution vs multiplicity

# Residuals after tilt correction

## Residuals on single pixel clz on det1 data (multiplicity = 1)

long default run
VCASN = 5



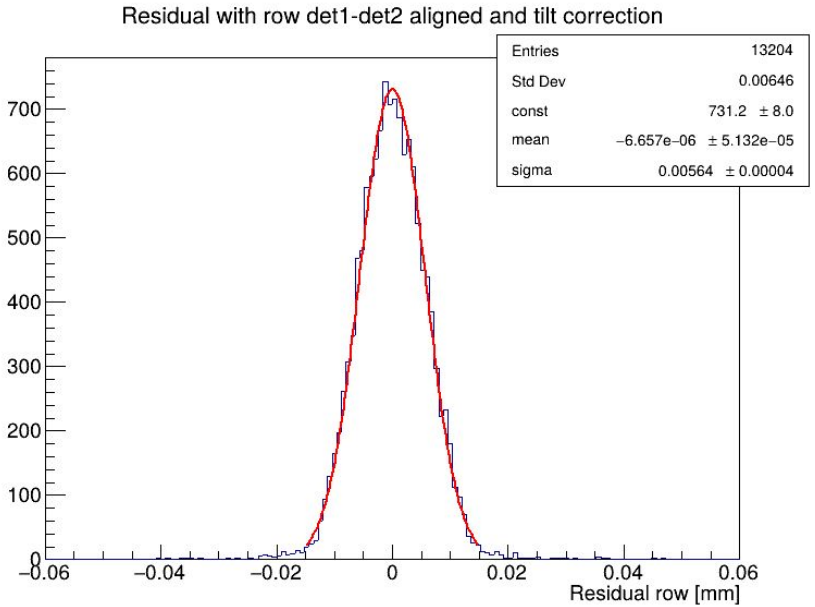

ARCADIA single point resolution
25/sqrt(12) = 7.2 um

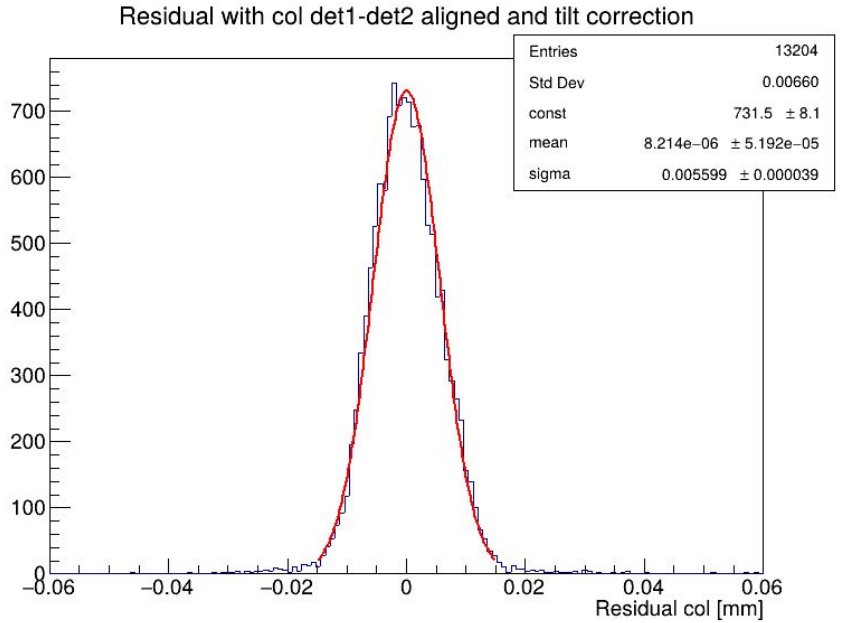
still ~5 um of sigma for single pixel clz
could be that at this high threshold they are not “really” single pixel clz?

# Residuals after tilt correction

## Residuals on single pixel clz on det1 data (multiplicity = 1)

Same study but at **lower** threshold → VCASN = 20




sigmas considering all clz on det1
row = 0.005329
col = 0.005321

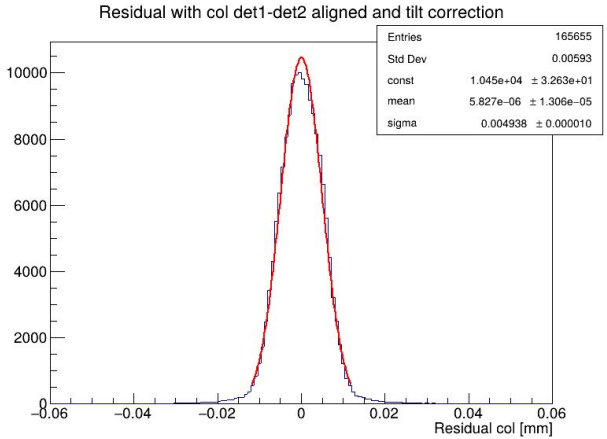
→

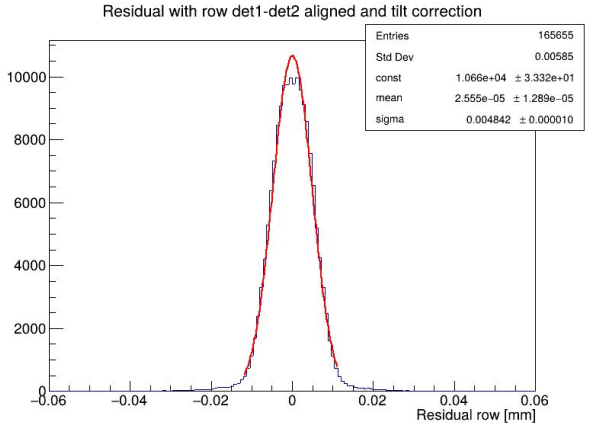
Still not equal to single point resolution but higher sigmas

# **Residuals after tilt correction:** Residuals on det1 data

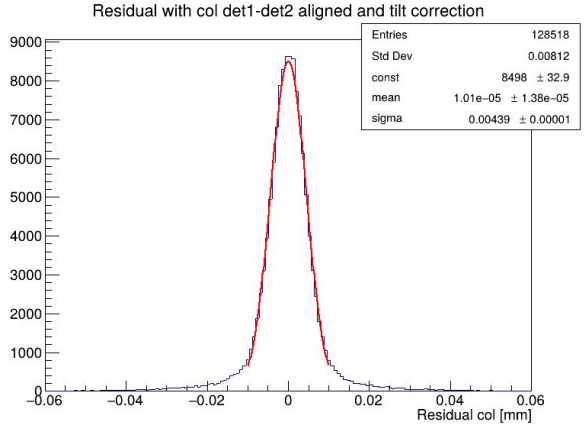
long default run

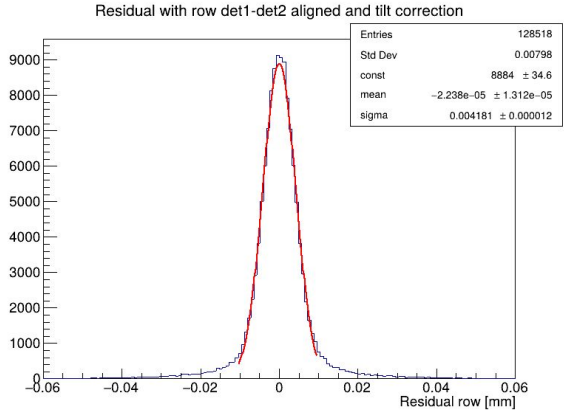
## multiplicity = 2



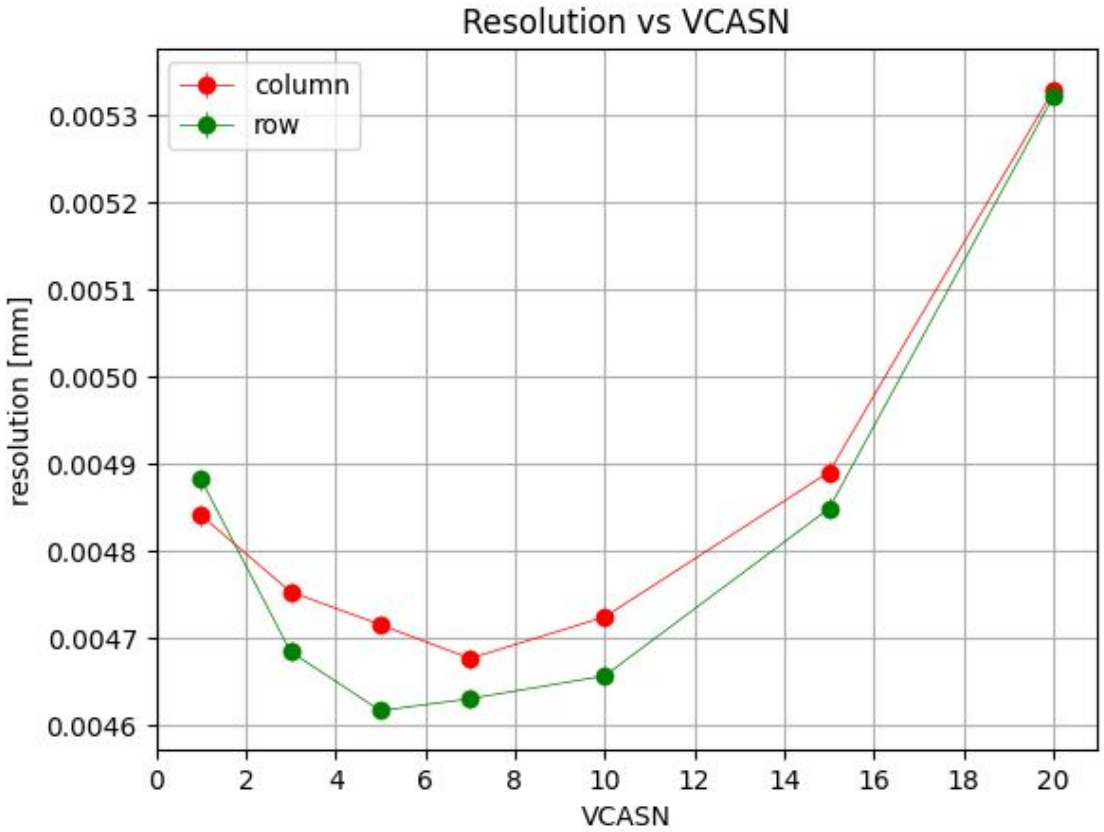

## multiplicity > 2



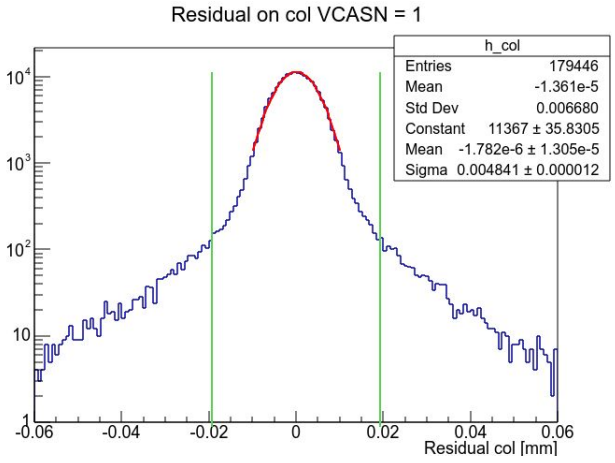



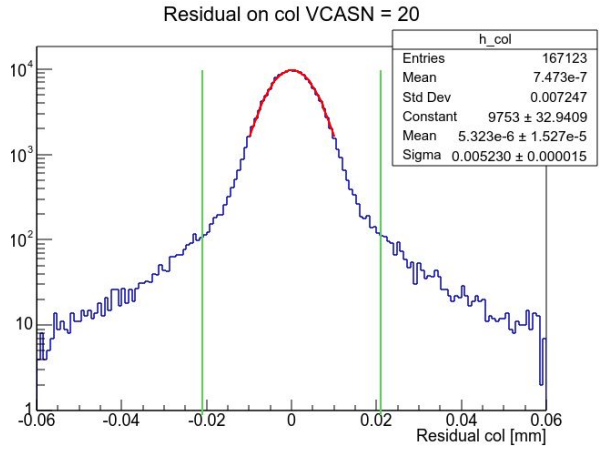

improvement of resolution as multiplicity (charge sharing) increases

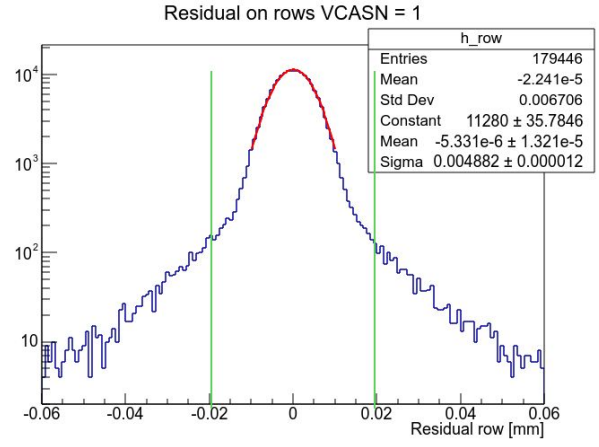
# Resolution vs threshold (VCASN)

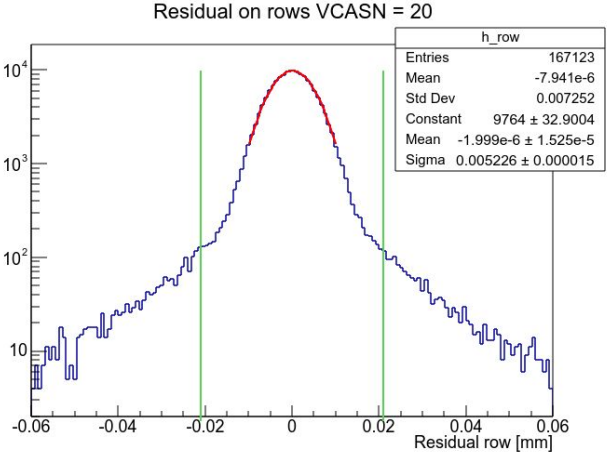


# Study on Tails of residual histograms



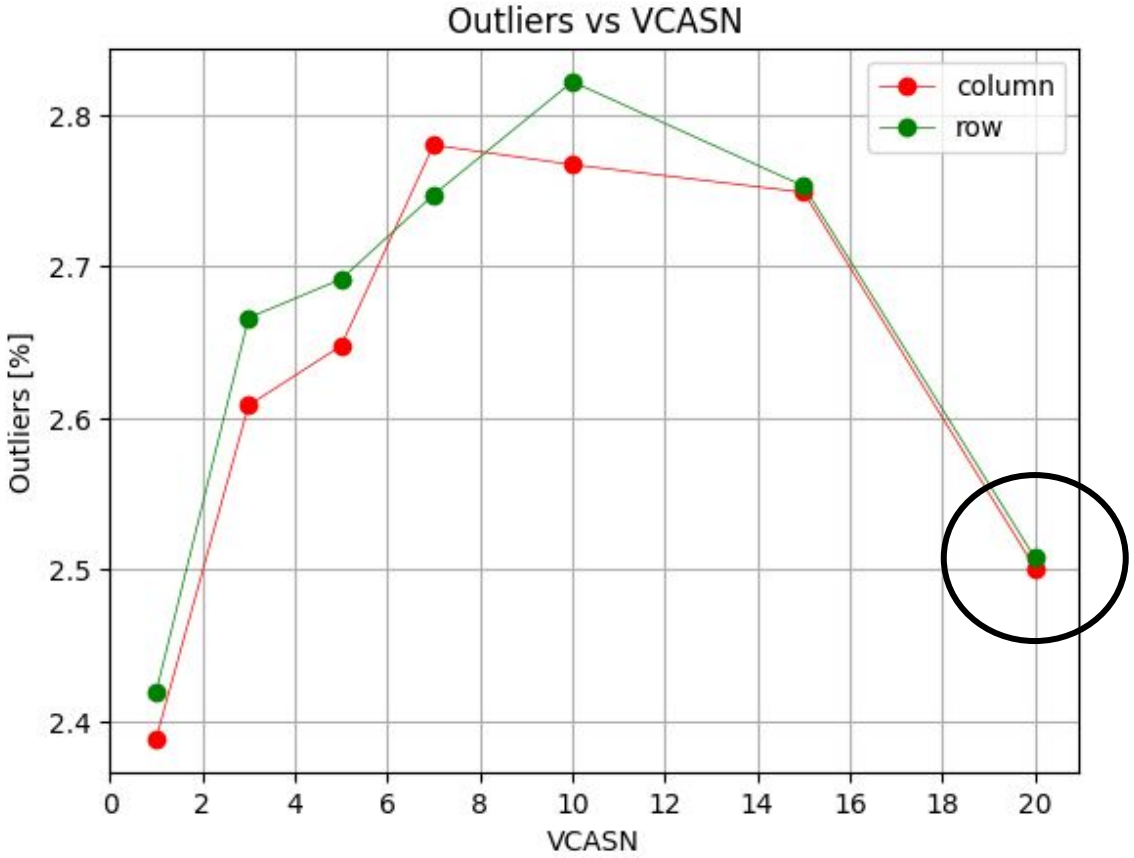




Residual histograms in log scale to enhance tails

Outliers of the histogram calculated as:
residuals > mean + **4***sigma

Mean and sigma come from gaussian fit of residuals with det1-det2 aligned and tilt correction

# Study on Tails of residual histograms

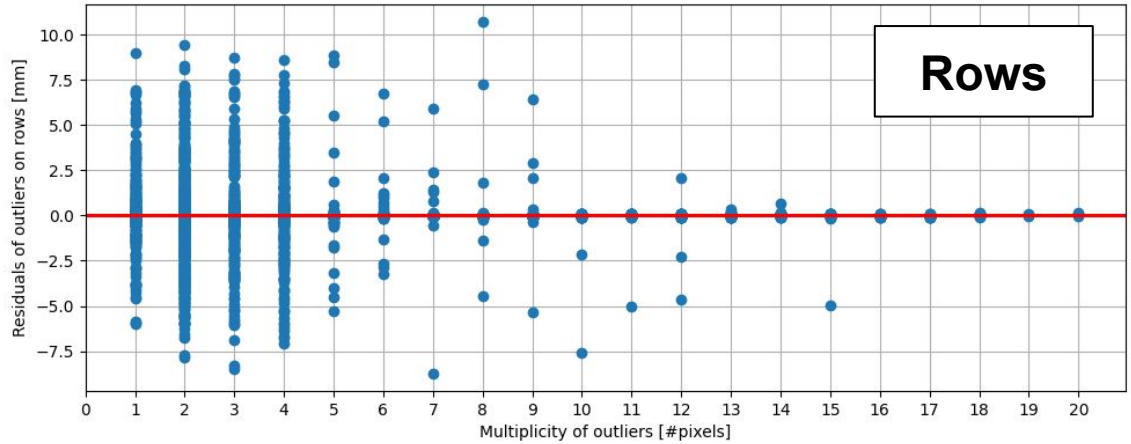


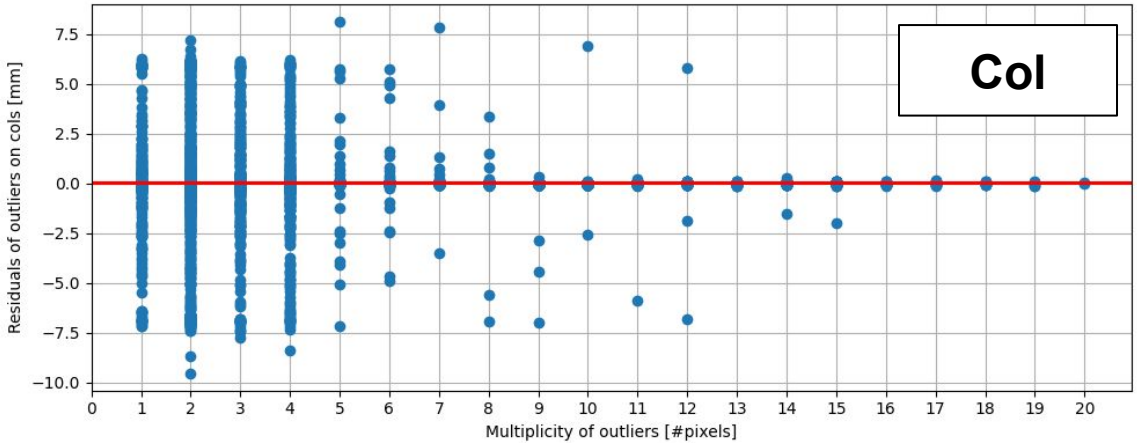

Amount of outliers (in %) per each VCASN

Outliers % grows with VCASN

VCASN = 20 distribution is broader (sigma ~ 0.0053 respect to ~0.0047 @ VCASN = 5) so outliers % is smaller

# Study on Tails of residual histograms



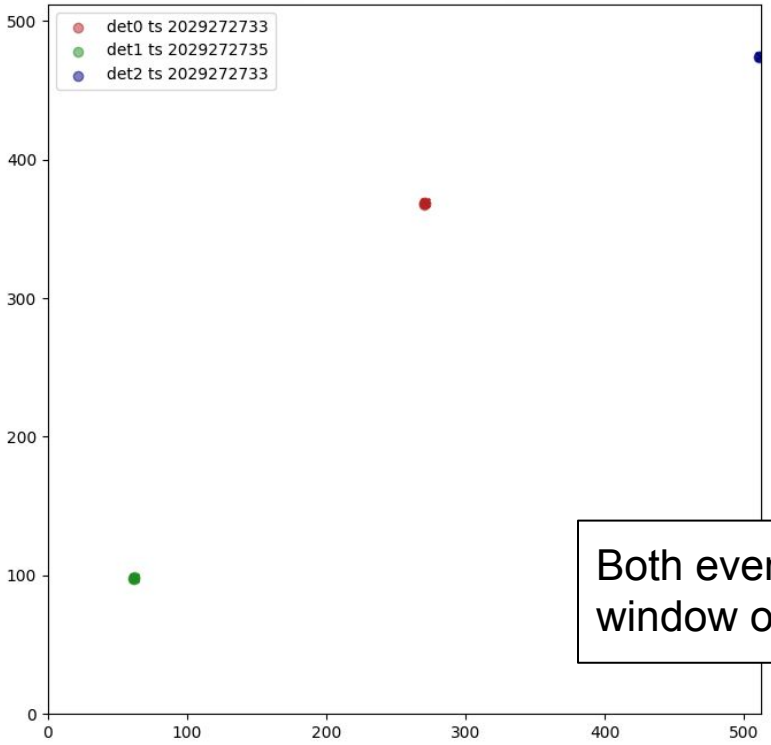




Residuals of clz with high multiplicity (>10) are not so distant from the threshold. They do not contribute heavily to tails

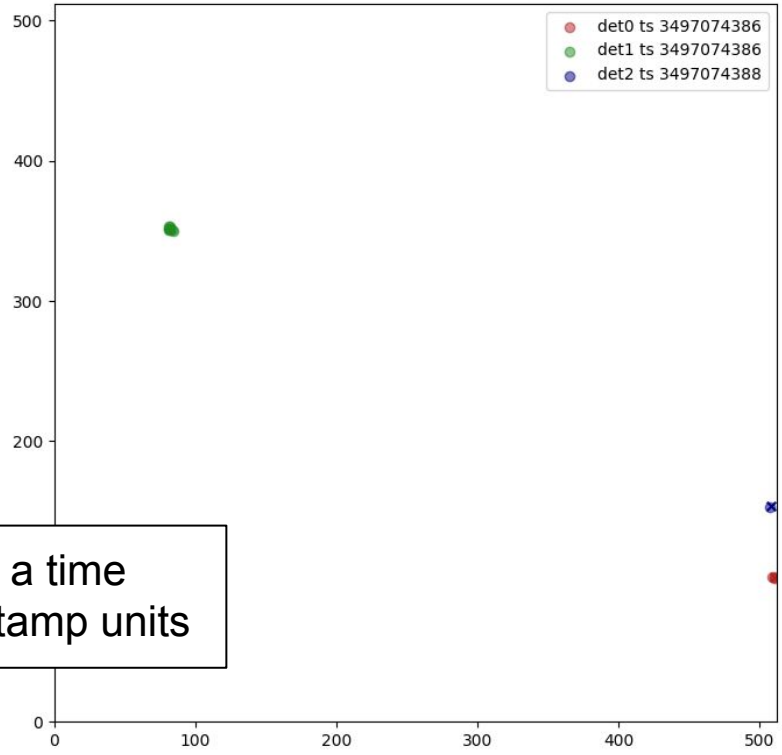
# Study on Tails of residual histograms

## Single event display

Hitmaps of event with
residual = 8.45 mm on col

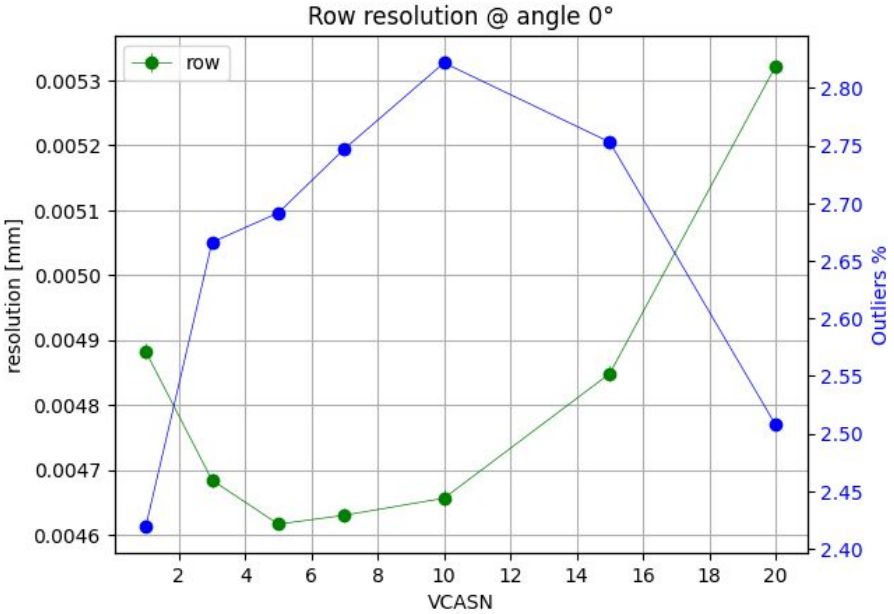


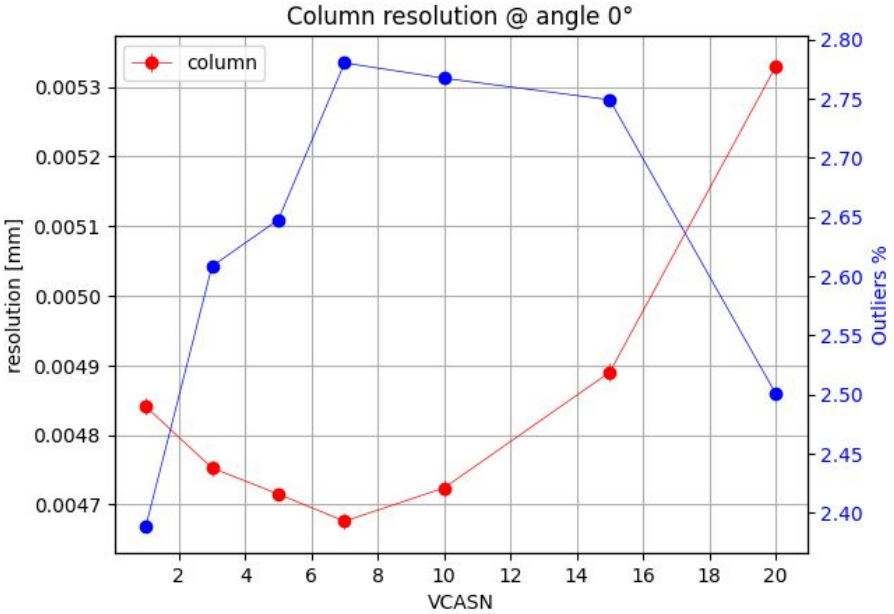

Hitmaps of event with
residual = 10.71 mm on rows



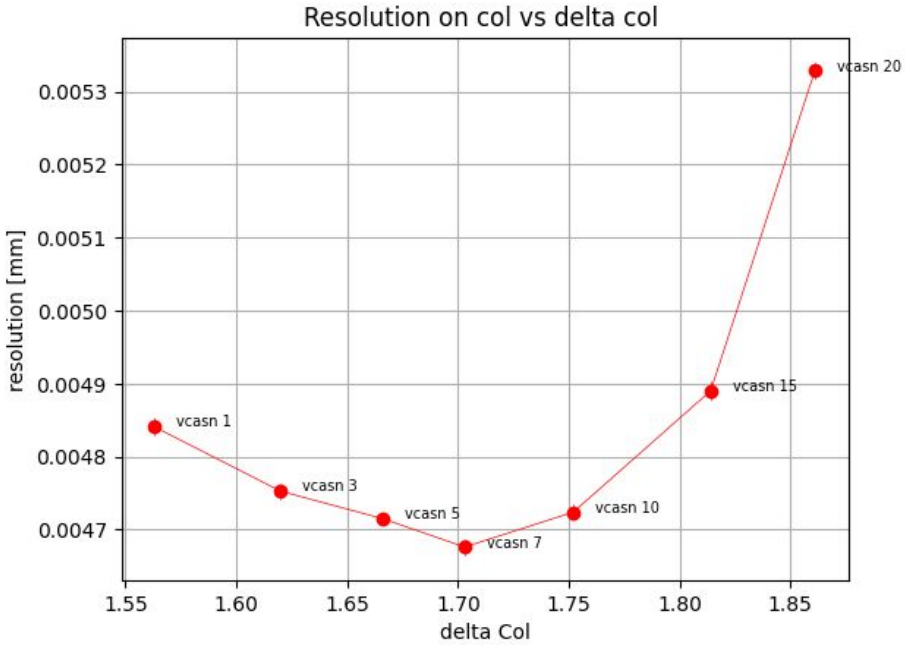

Both events are in a time window of 2 timestamp units

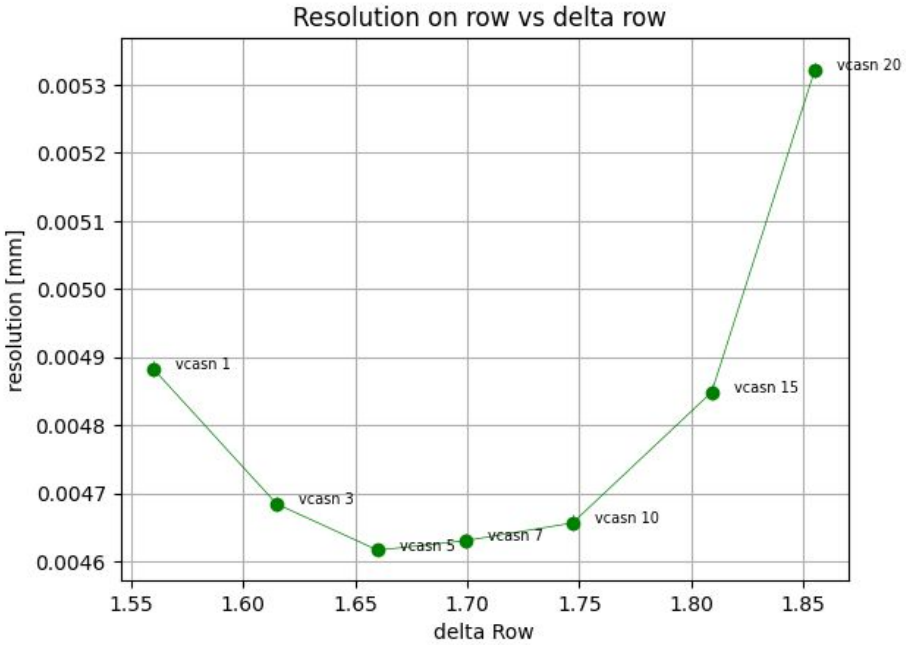
# Resolution vs threshold (VCASN) and % of outliers



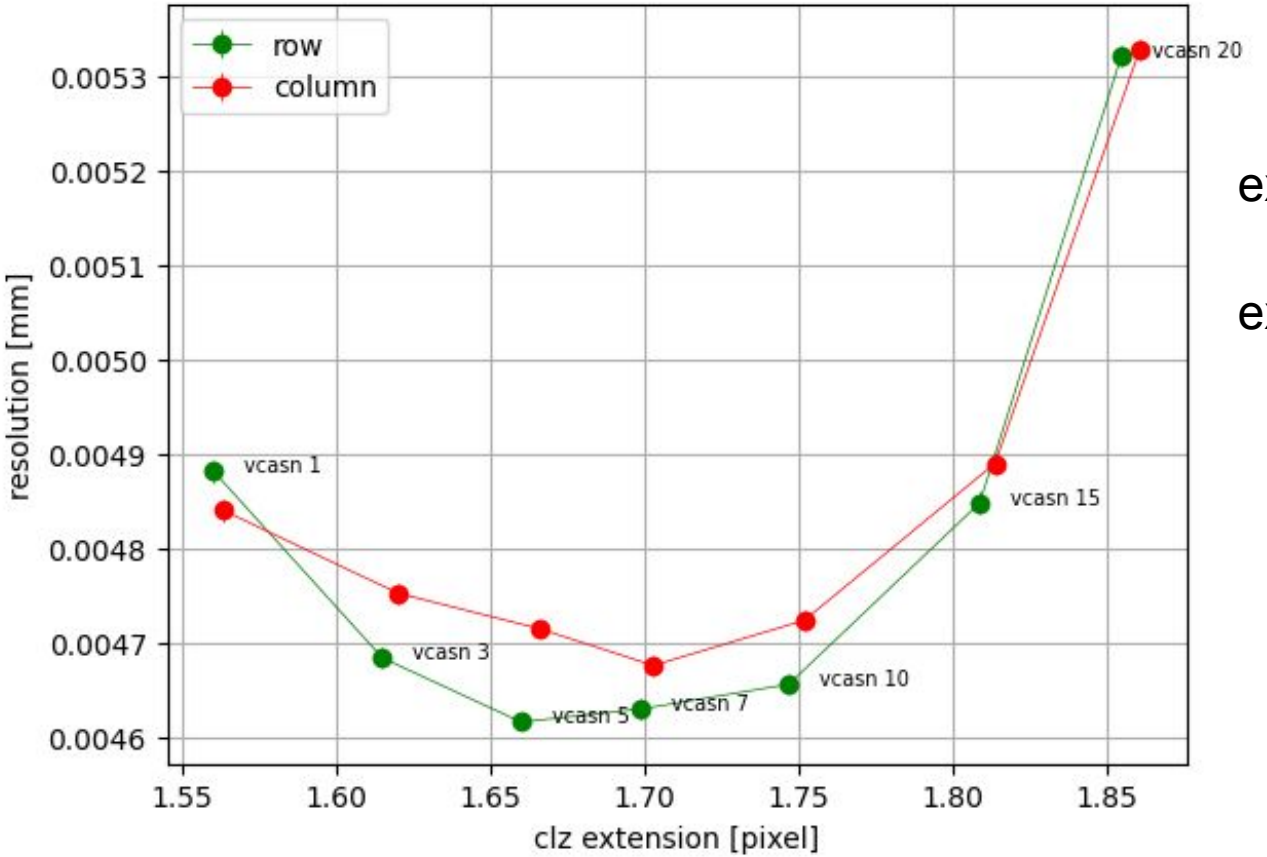



# Resolution vs clz extension (delta row, delta col)



# Resolution vs clz extension (delta row, delta col)

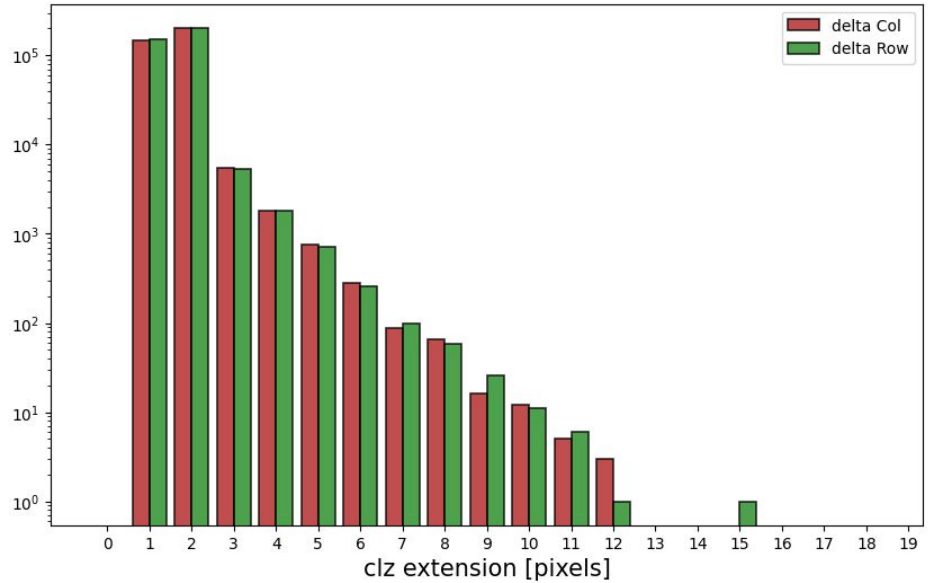


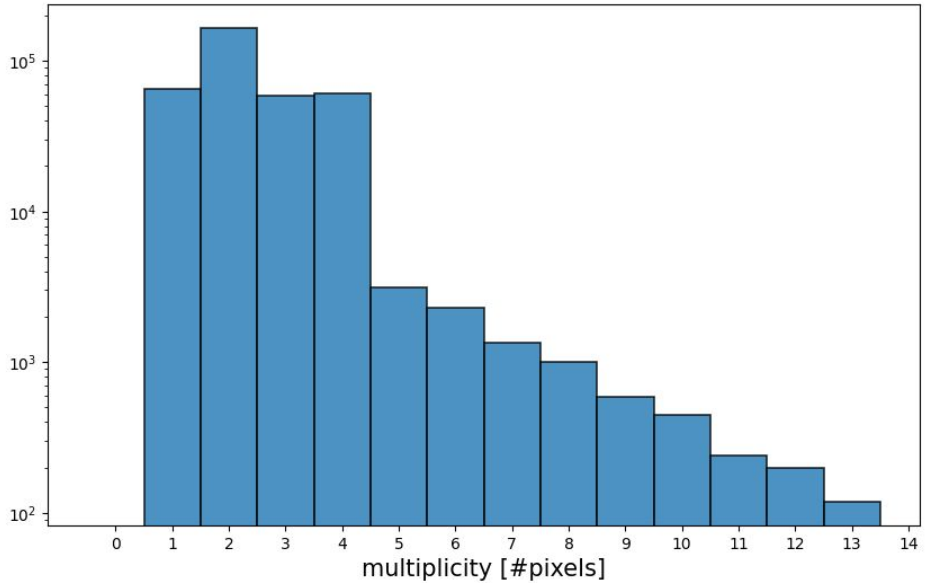

extension on row: delta Row

extension on col: delta Col

# Distribution of det1 clusters used in tracking

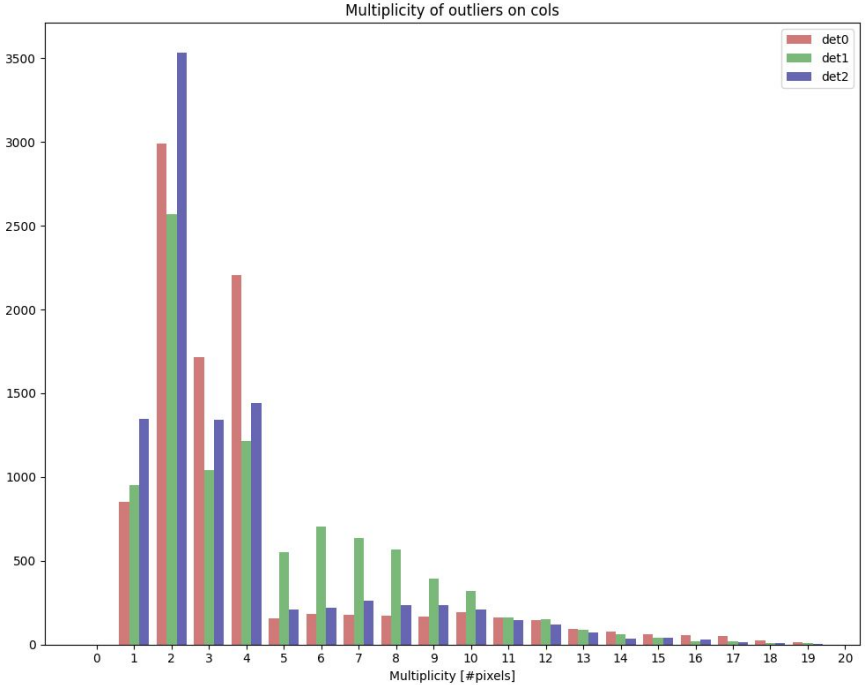
Number of det1 clz used in tracking: 359230

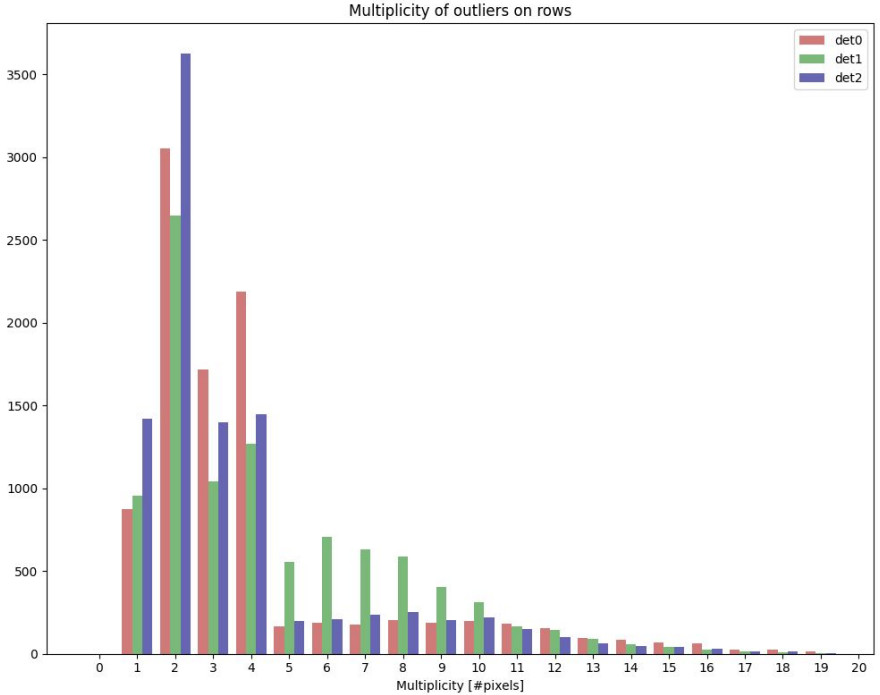


# BACK UP

# Study on Tails of residual histograms



# Study on Tails of residual histograms