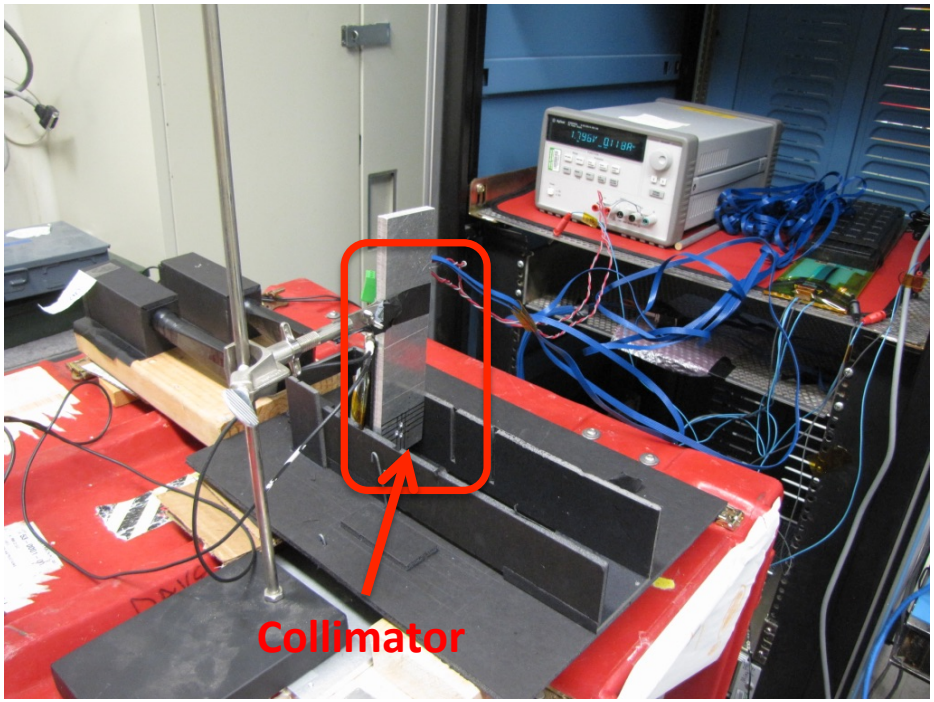
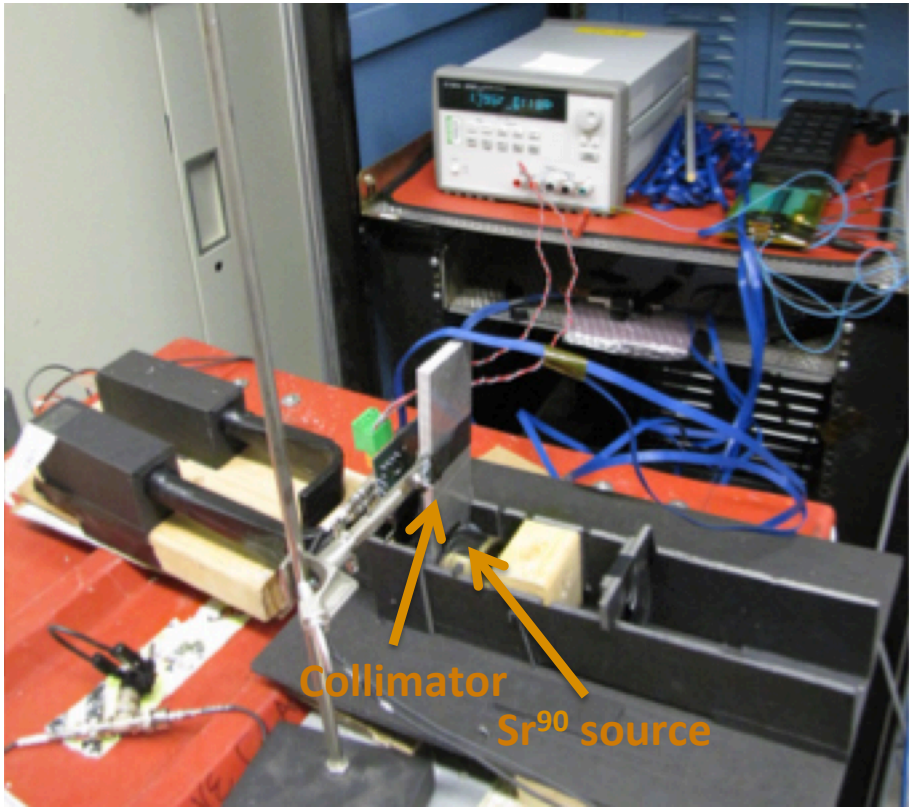
MVTX chip test upgrade

Xuan Li (LANL)

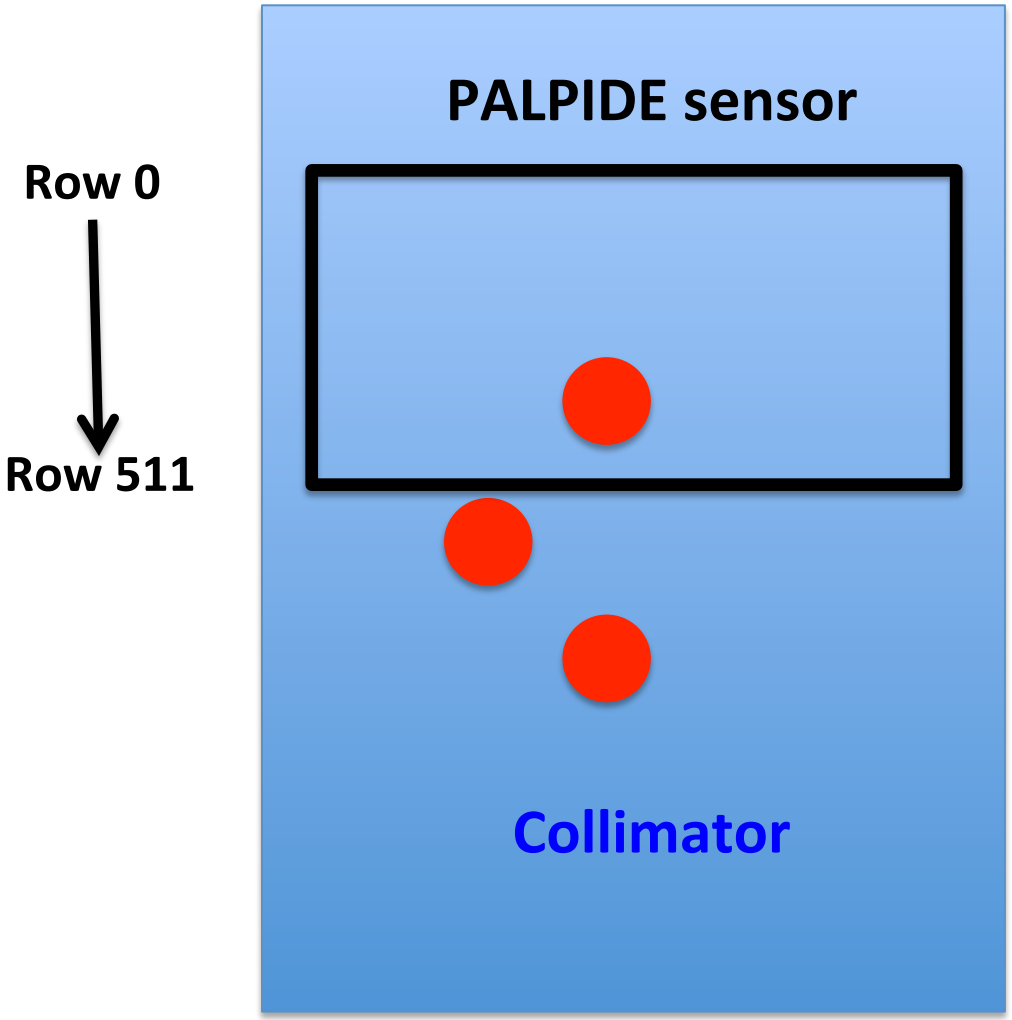
Use the collimator with three hole structure

- New configuration of the setup.



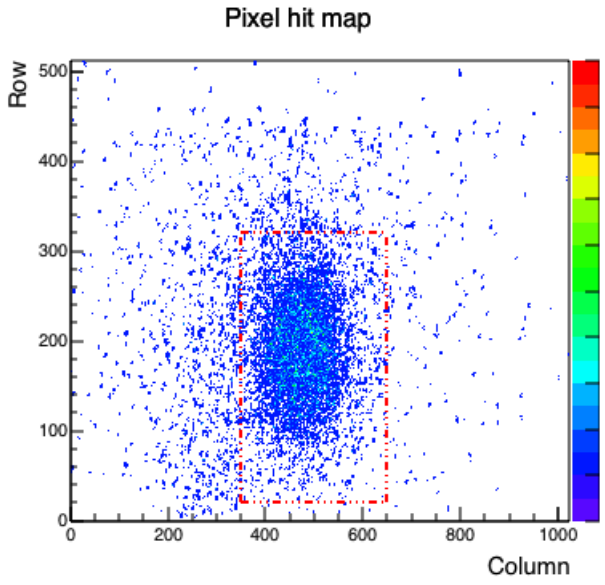


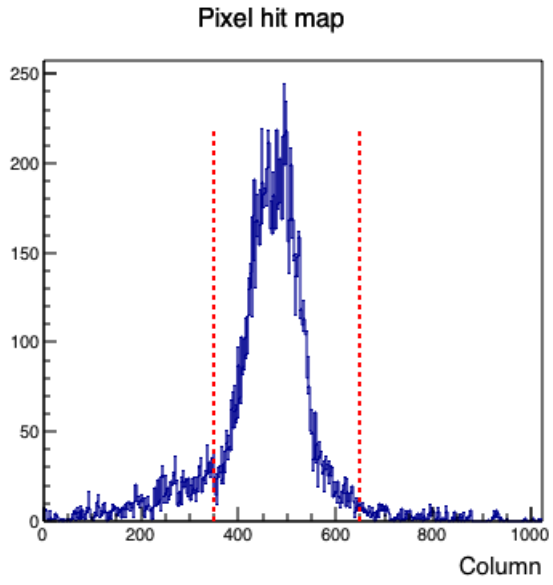
Sr^{90} beta decay electrons with collimator
Trigger delay time: 2 µs

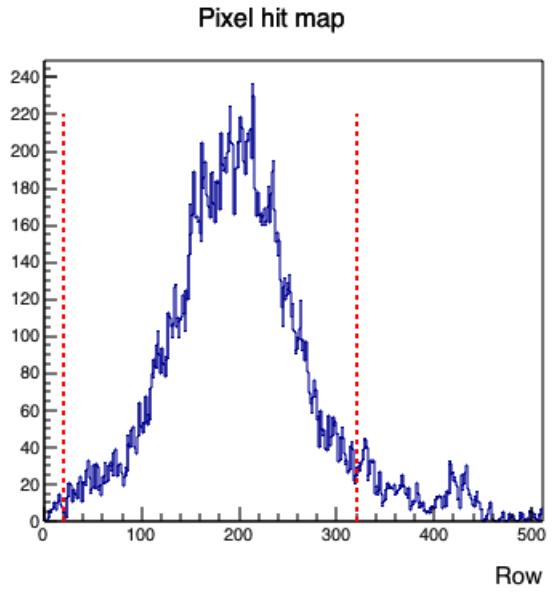


Hit and cluster 2D distribution with the new collimator (Sr^{90})

- Pixel map (left), Column profile (middle) and row profile (right).
- Removed noise pixels.



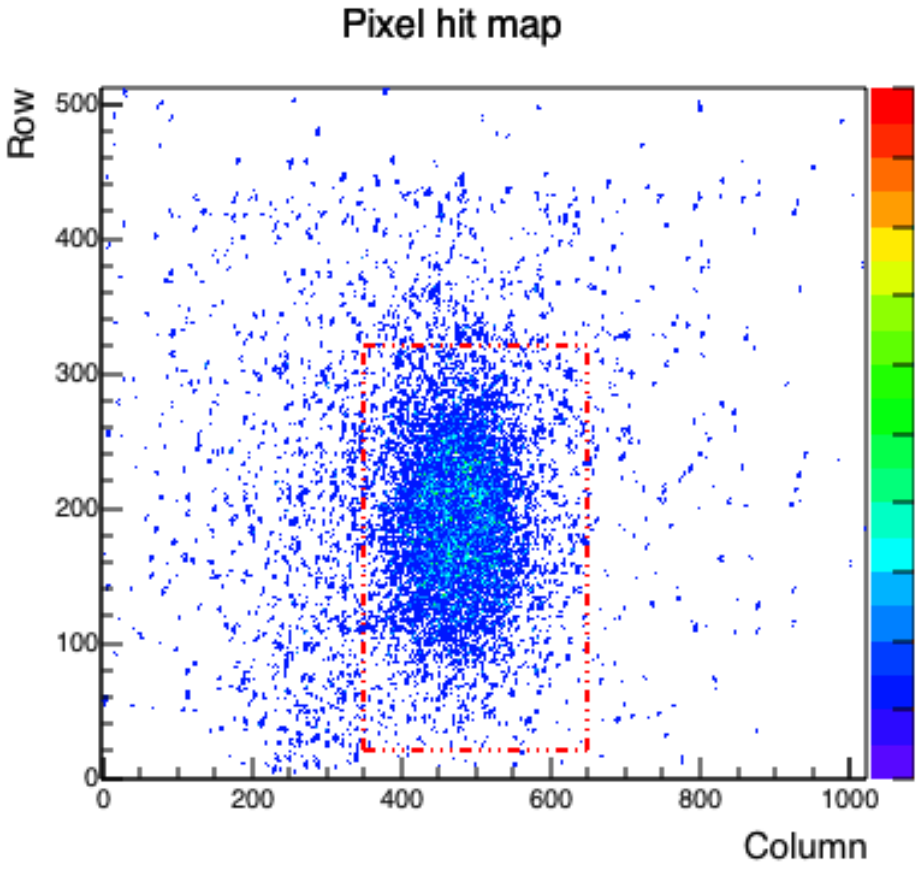


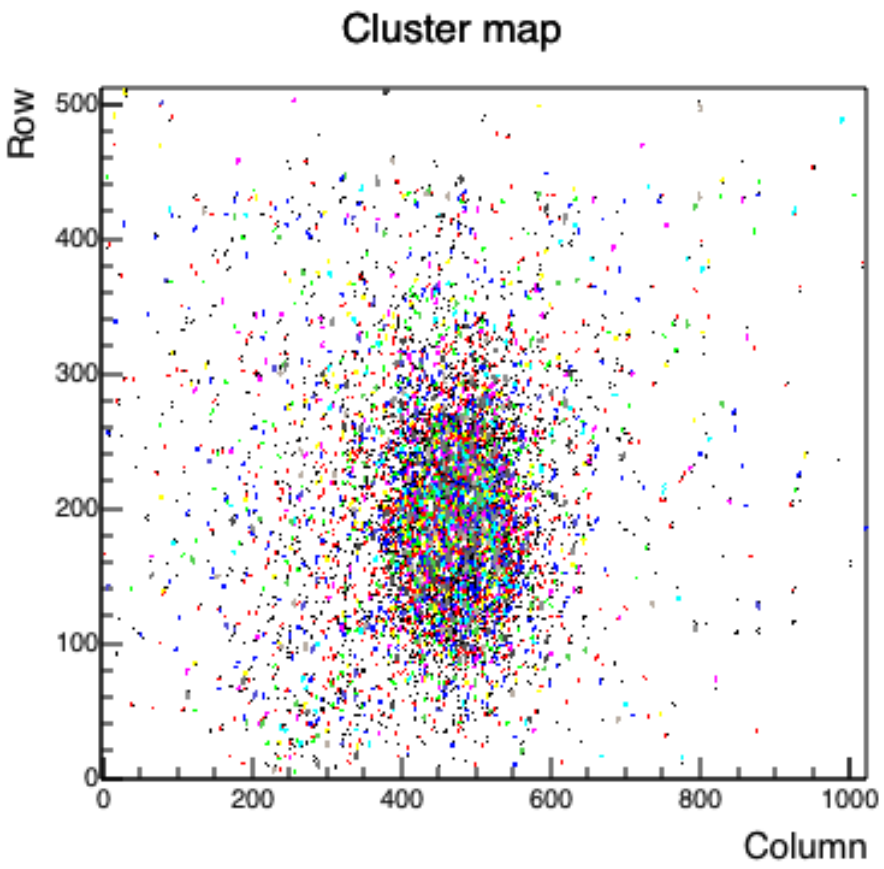


- Clear hole structure from the collimator.

Hit and cluster 2D distribution with the new collimator (Sr^{90})

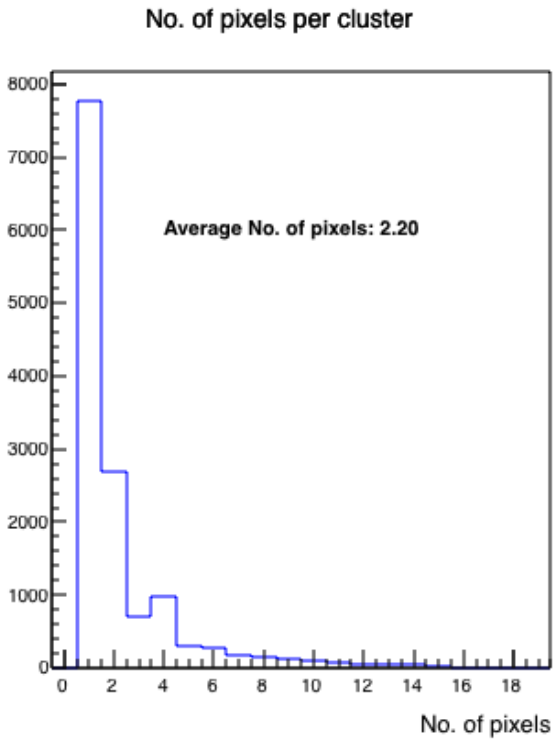
- Pixel map (left), cluster map (right).
- For cluster finder, exclude big size cluster (no. of pixels > 16).

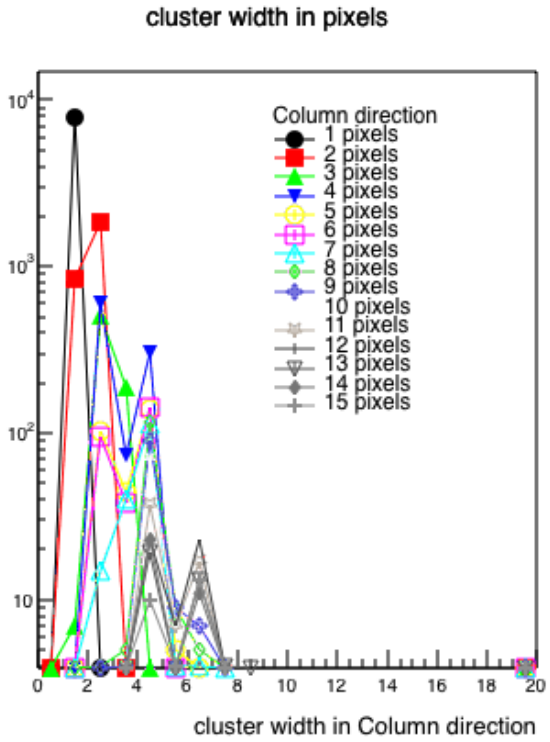


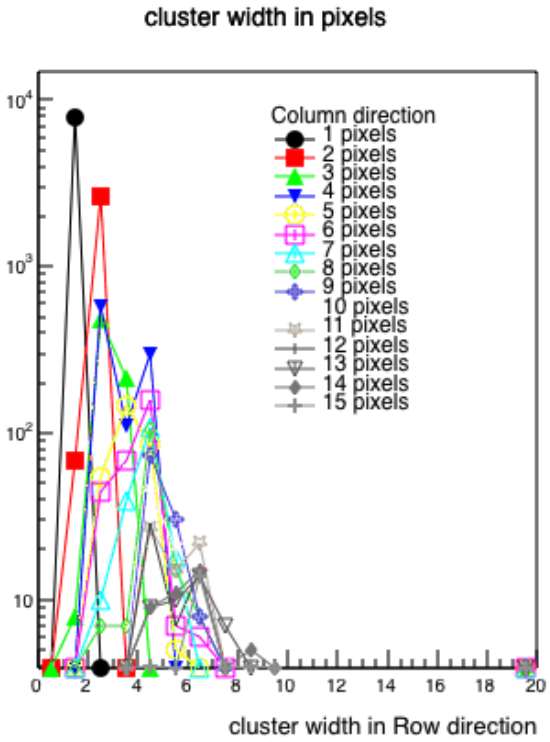


Number of pixels distribution per cluster (Sr^{90})

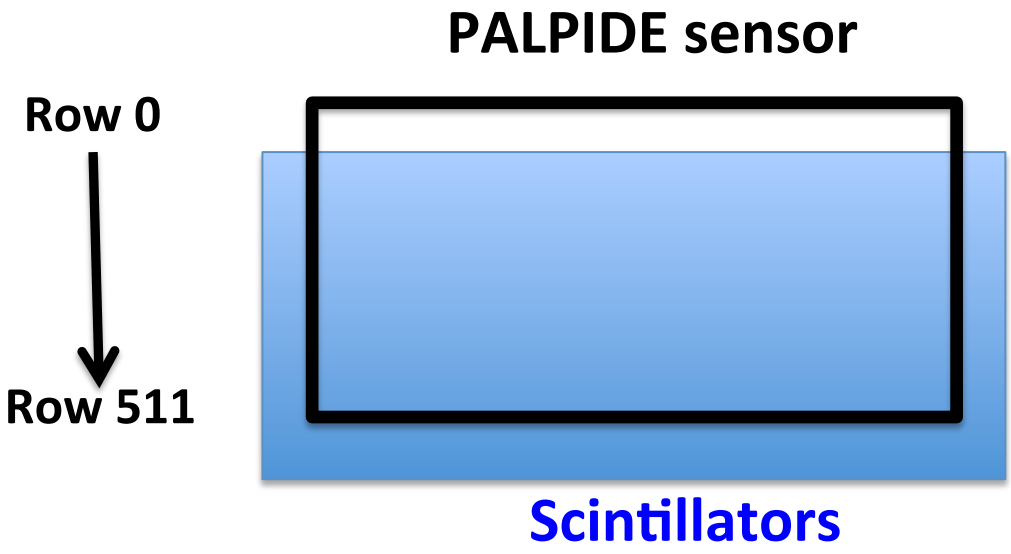
- Trigger delay time: 2 µs.

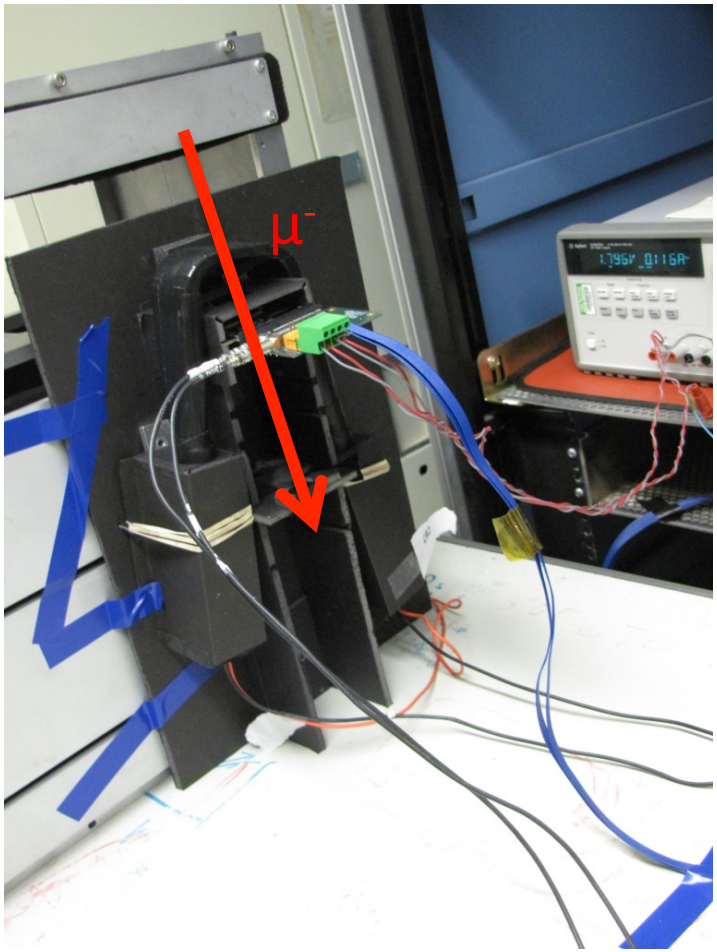






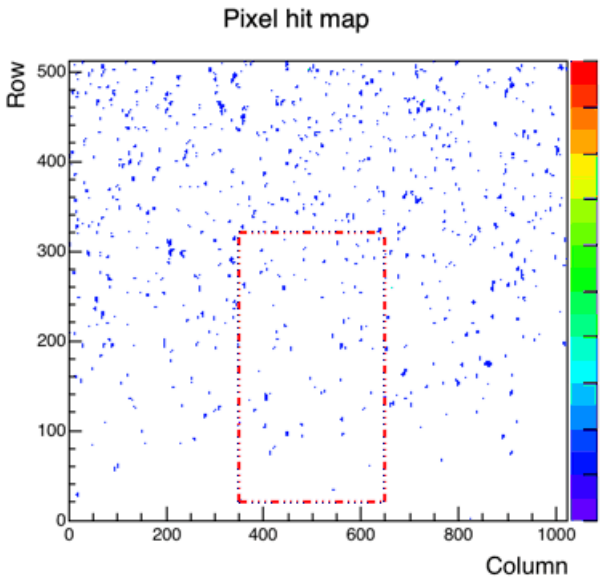
Cosmic ray muons
Trigger delay time: 2 µs

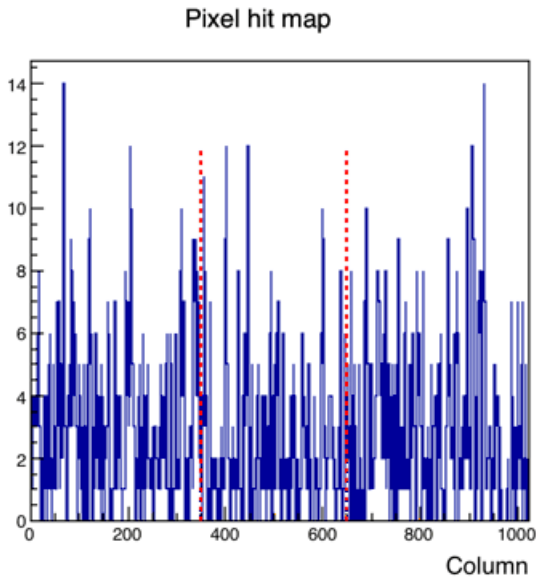


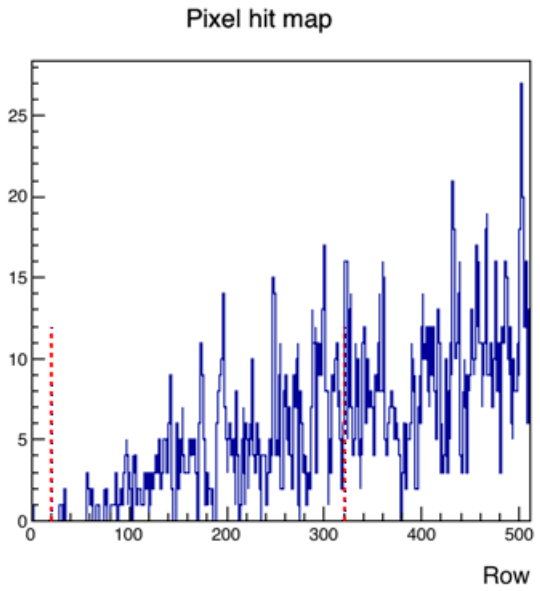


Hit and cluster 2D distribution with the new collimator (Cosmic ray muons)

- Pixel map (left), Column profile (middle) and row profile (right).
- Removed noise pixels.



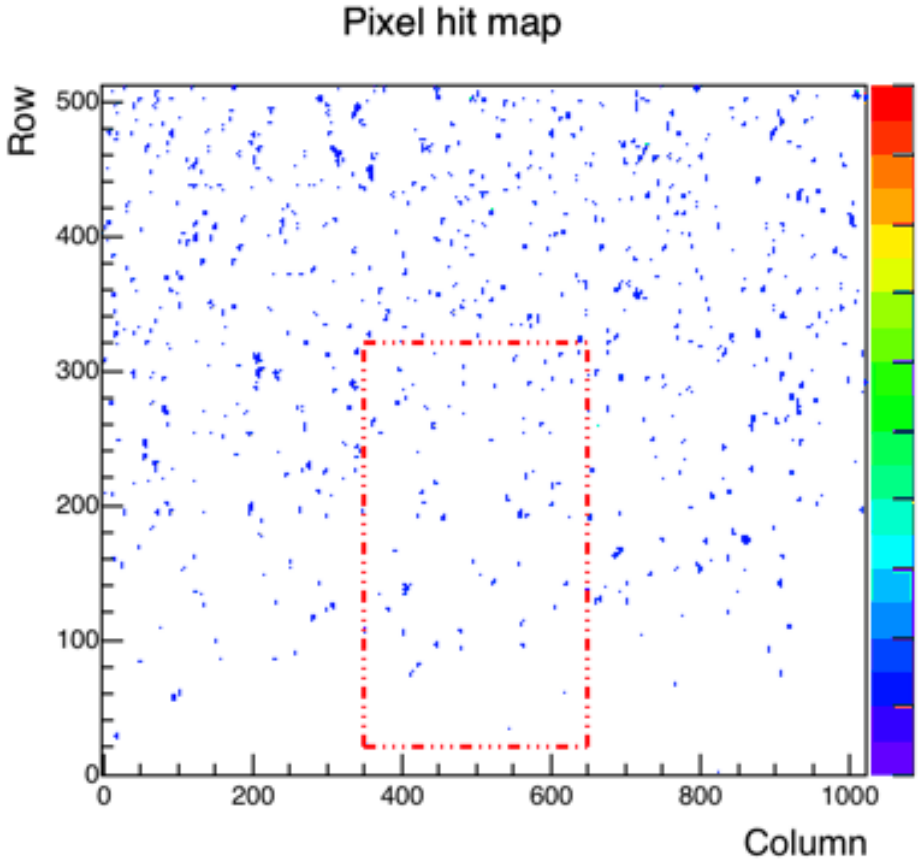


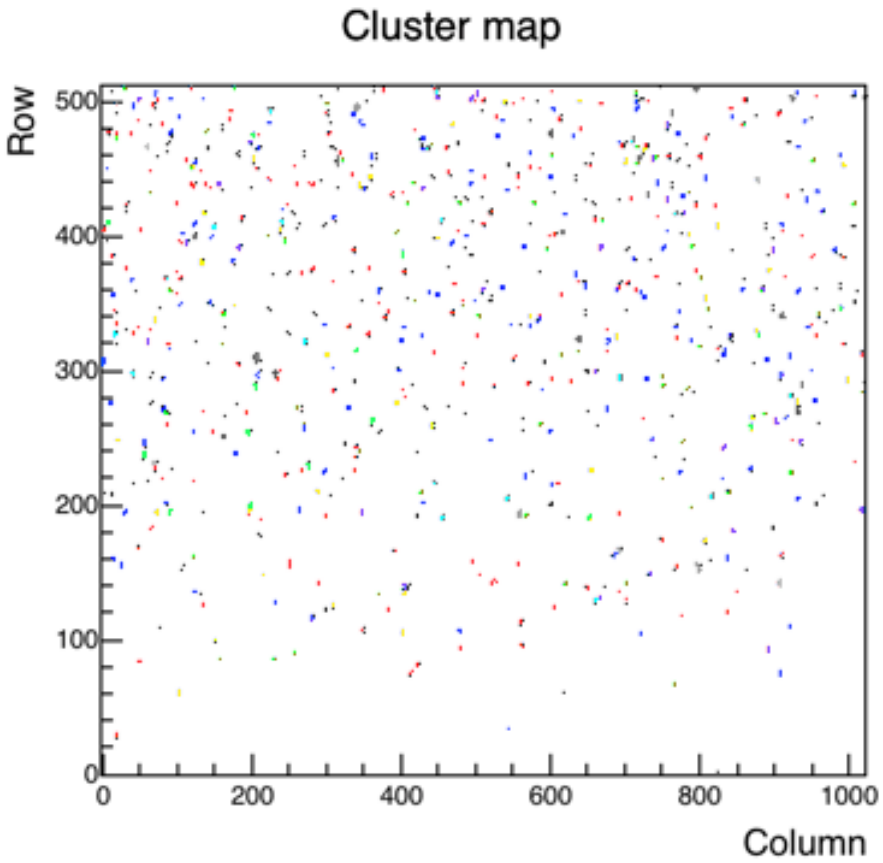


- Clear hole structure from the collimator.

Hit and cluster 2D distribution with the new collimator (Cosmic ray muons)

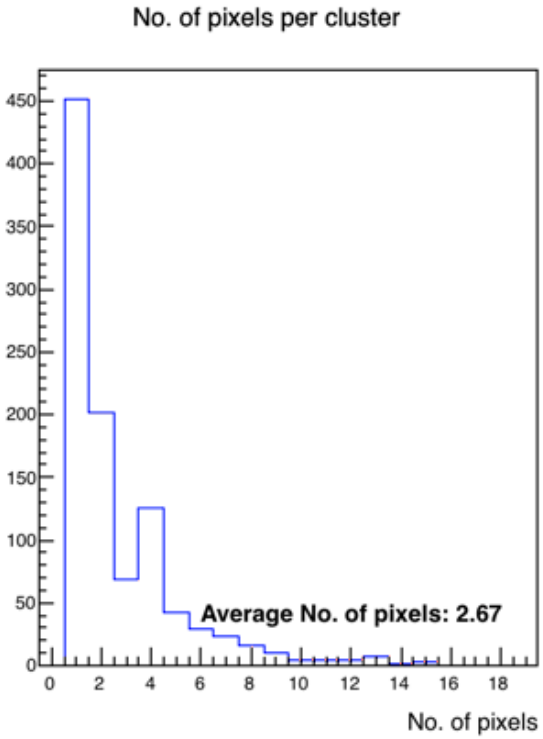
- Pixel map (left), cluster map (right).
- For cluster finder, exclude big size cluster (no. of pixels > 16).

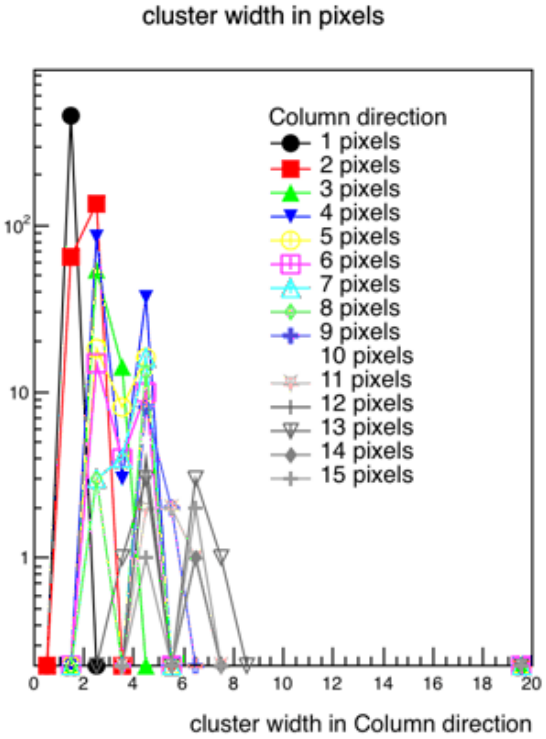


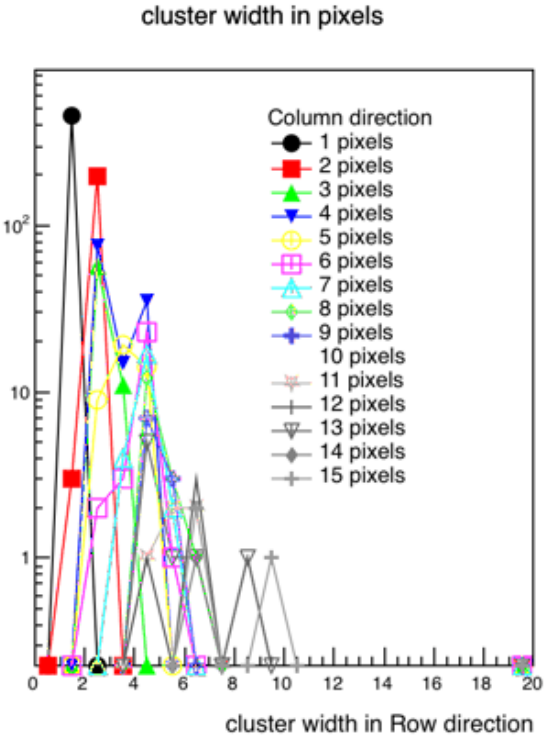


Number of pixels distribution per cluster (Cosmic ray muons)

- Trigger delay time: 2 μs.







Conclusions

- Clear structure from the collimator has been seen from the Sr^{90} test.
- Clear cluster distribution from cosmic ray muons. The cosmic ray muon tends to have slightly different cluster size from Sr^{90} decayed electrons.

To do

- Continue the trigger delay time scan and tune the DAC parameters to modify the pulse shaping time.
- Study the efficiency to check the threshold setting.
- Optimize the parameters to tune the pixel performance.

Backup

Number of pixels distribution per cluster from CERN beam test

- 450 MeV e- beam.