

VTX efficiency

Reconstruction

- Raw Data:
 - GSI2021 - run 4306
- MC Data
 - GSI2021_MC - run 400

DeadPixels = noisy channel
switched off

- Configuration files: TAVTdetector.cfg

```
// -*-*-*-*-*-*-*-*-*-*-*-*-*-*-*- Plane 1 -*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-
InputNumber:      1
Status:           0
MinNofPixelsInCluster: 2
MaxNofPixelsInCluster: 400
DeadPixels:       -1

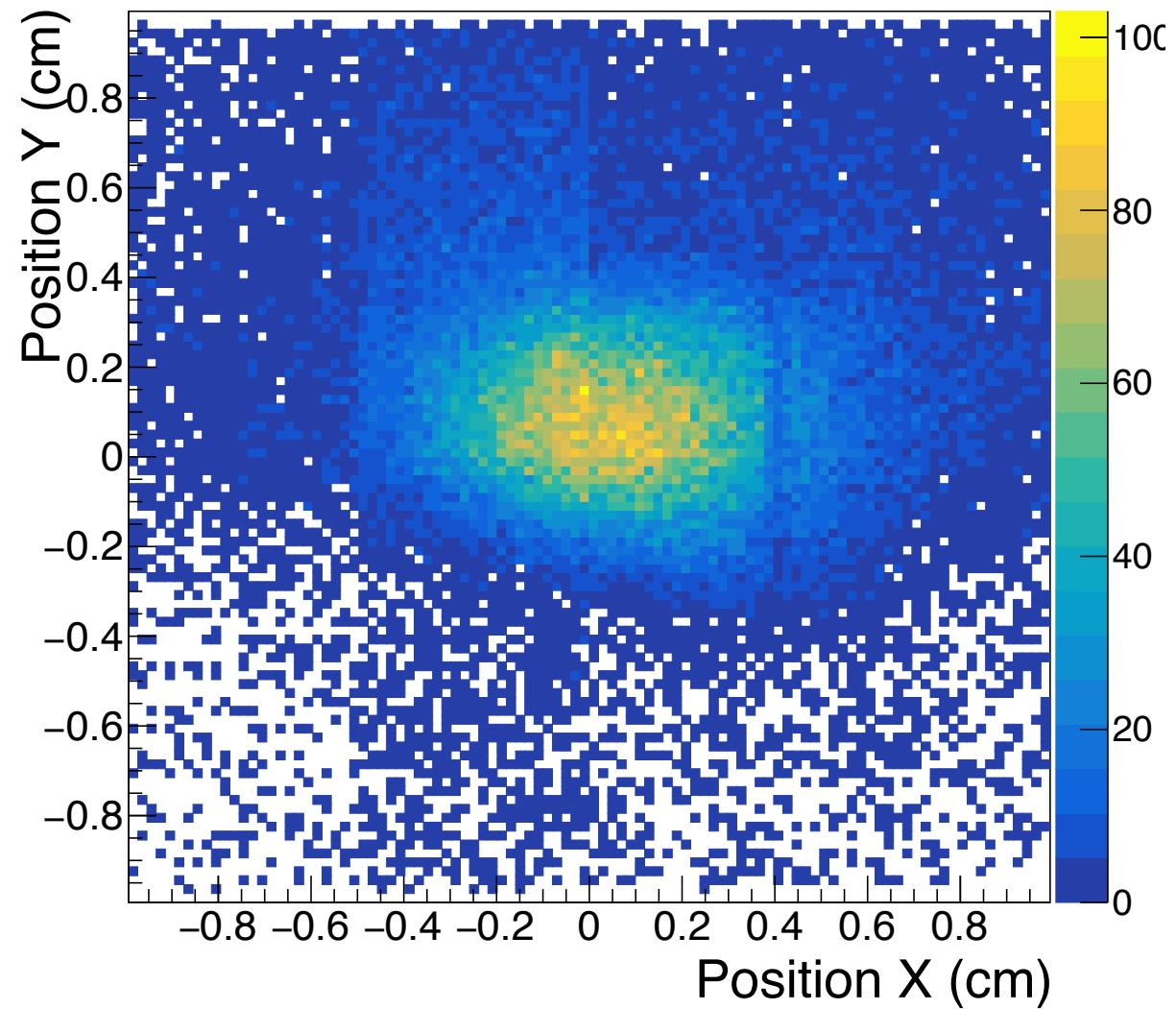
// -*-*-*-*-*-*-*-*-*-*-*-*-*-*-*- Plane 2 -*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-
InputNumber:      2
Status:           2
MinNofPixelsInCluster: 2
MaxNofPixelsInCluster: 400
DeadPixels:       282, 00-959;

// -*-*-*-*-*-*-*-*-*-*-*-*-*-*-*- Plane 3 -*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-
InputNumber:      3
Status:           2
MinNofPixelsInCluster: 2
MaxNofPixelsInCluster: 400
DeadPixels:       335, 600-959; 336, 600-959; 337, 600-959; 338, 600-959;
339, 600-959; 340, 600-959; 341, 600-959; 342, 600-959; 343, 600-959; 344, 600-959;
345, 600-959; 347, 600-959; 348, 600-959; 349, 600-959; 350, 600-959; 351, 600-959;
352, 600-959; 278, 750-765; 279, 750-765; 280, 750-765; 281, 750-765; 282, 750-765;
283, 750-765; 284, 750-765; 285, 750-765; 286, 750-765; 335, 209-210; 336, 209-210;
337, 209-210; 338, 209-210; 339, 209-210; 340, 209-210; 341, 209-210; 342, 209-210;
343, 209-210; 344, 209-210; 345, 209-210; 347, 209-210; 348, 209-210; 349, 209-210;
350, 209-210; 351, 209-210; 352, 209-210;

// -*-*-*-*-*-*-*-*-*-*-*-*-*-*-*- Plane 4 -*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-
InputNumber:      4
Status:           1
MinNofPixelsInCluster: 2
MaxNofPixelsInCluster: 400
DeadPixels:       371, 00-959; 372, 00-959; 376, 00-959;
```

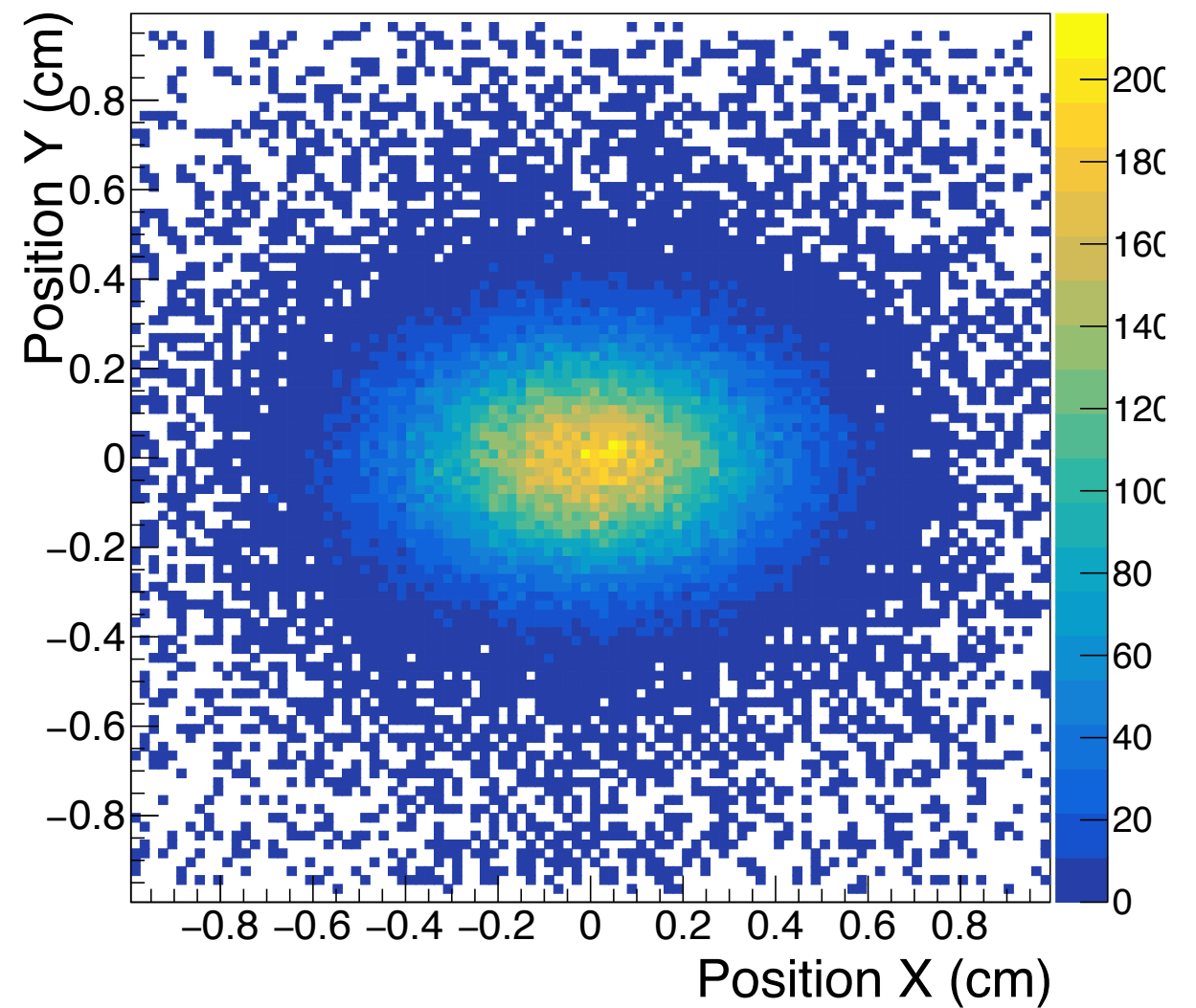
Beam spot

Cluster Map #1



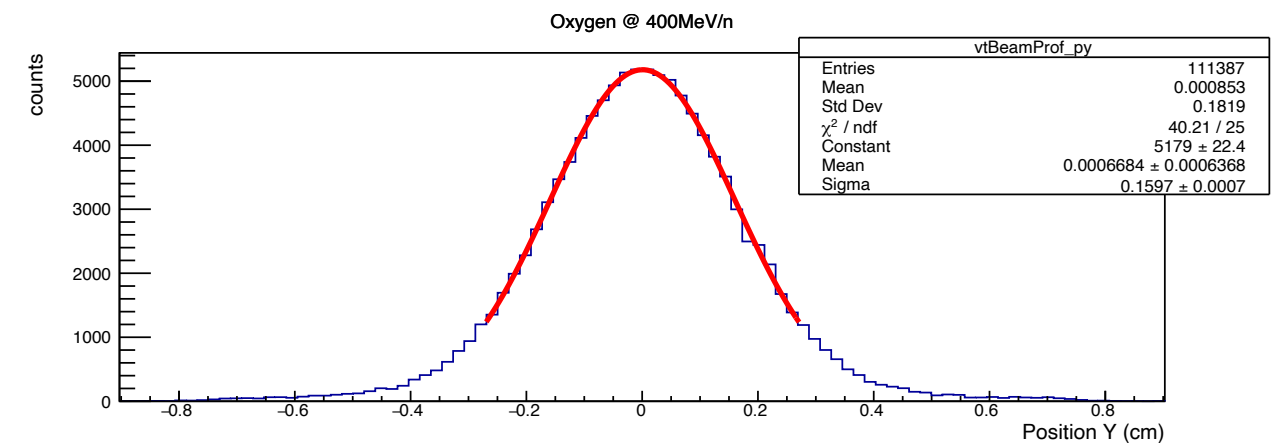
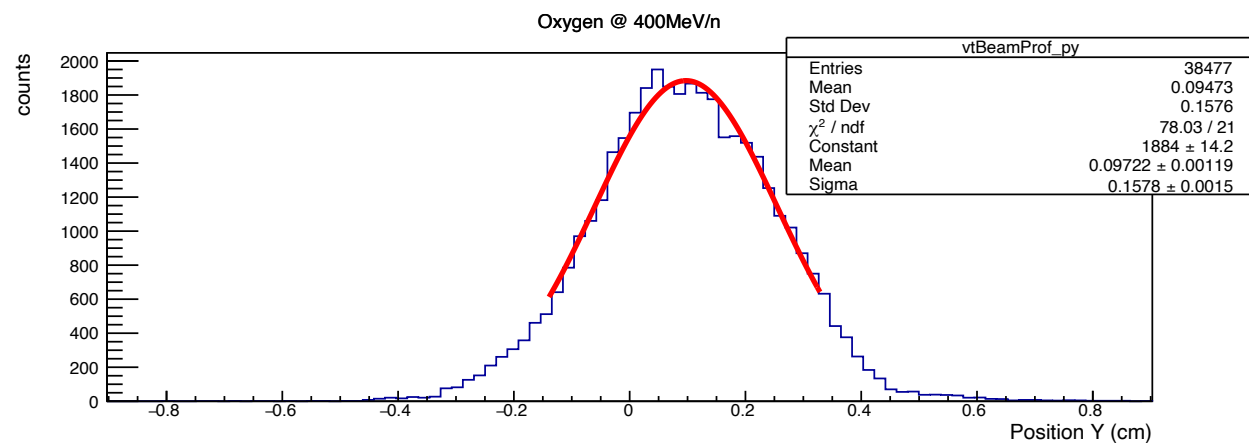
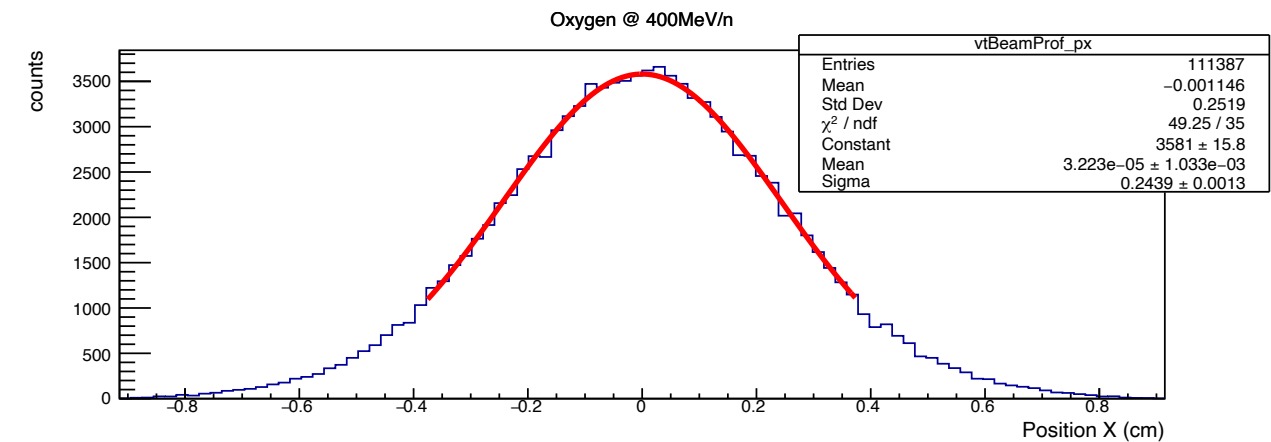
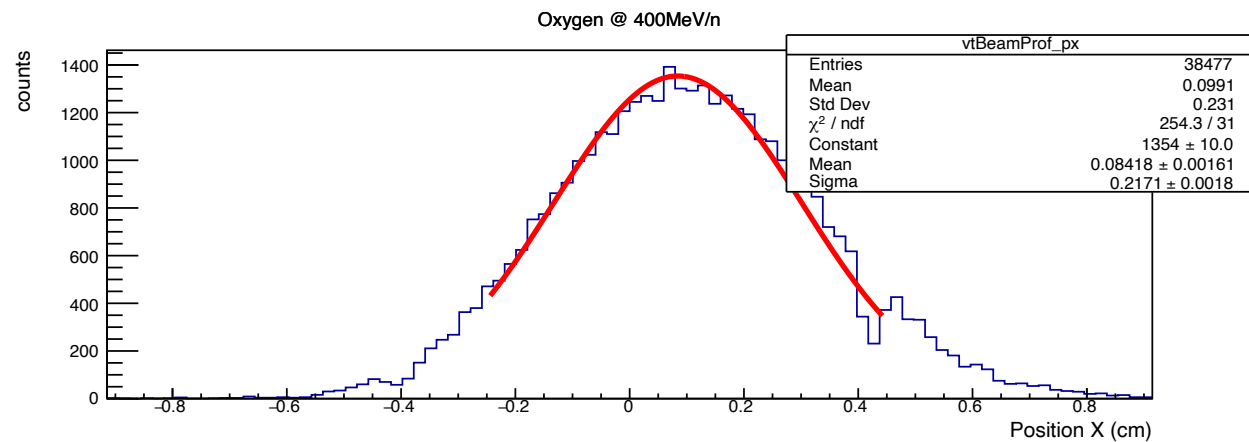
Raw Data

Cluster Map #1



MC Data

Beam spot



Raw Data

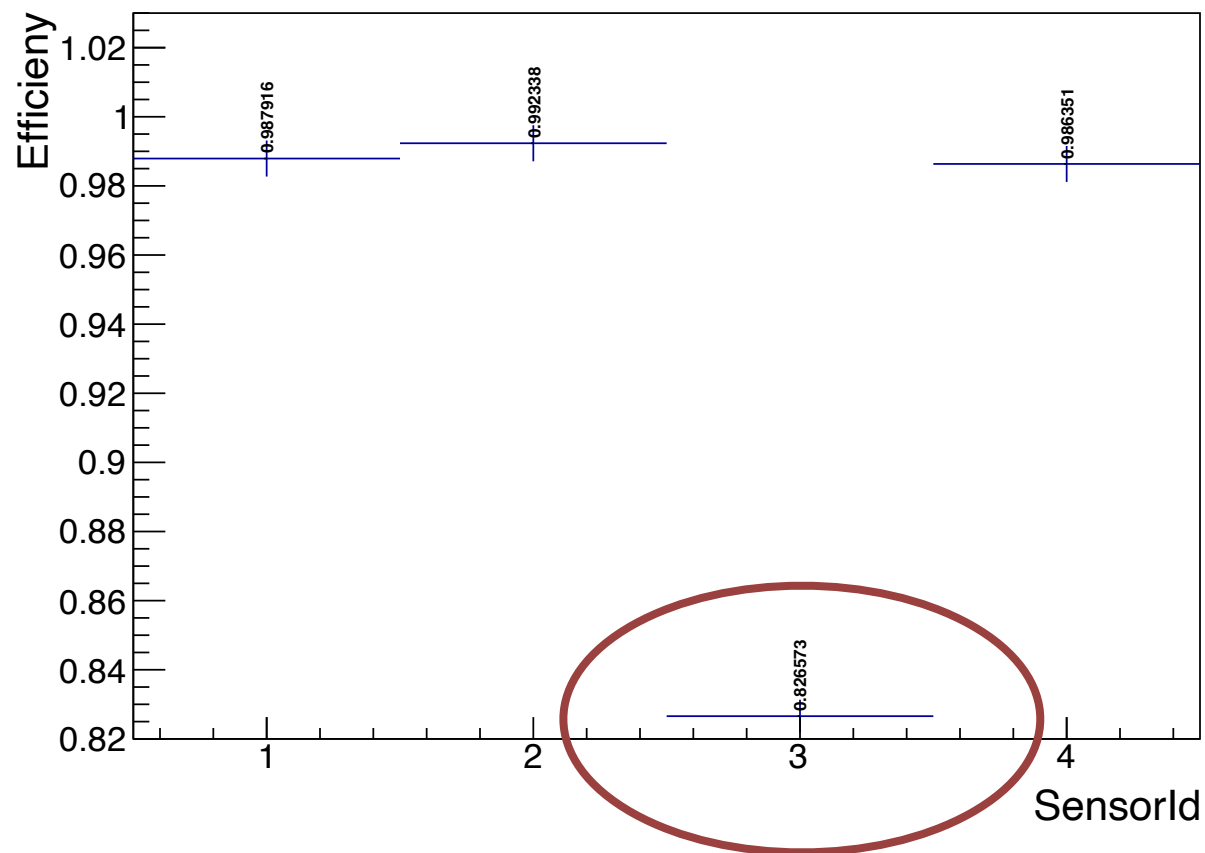
MC Data

- ➡ Width of the beam are similar but not the mean value
- ➡ Fired pixels are different

Efficiency

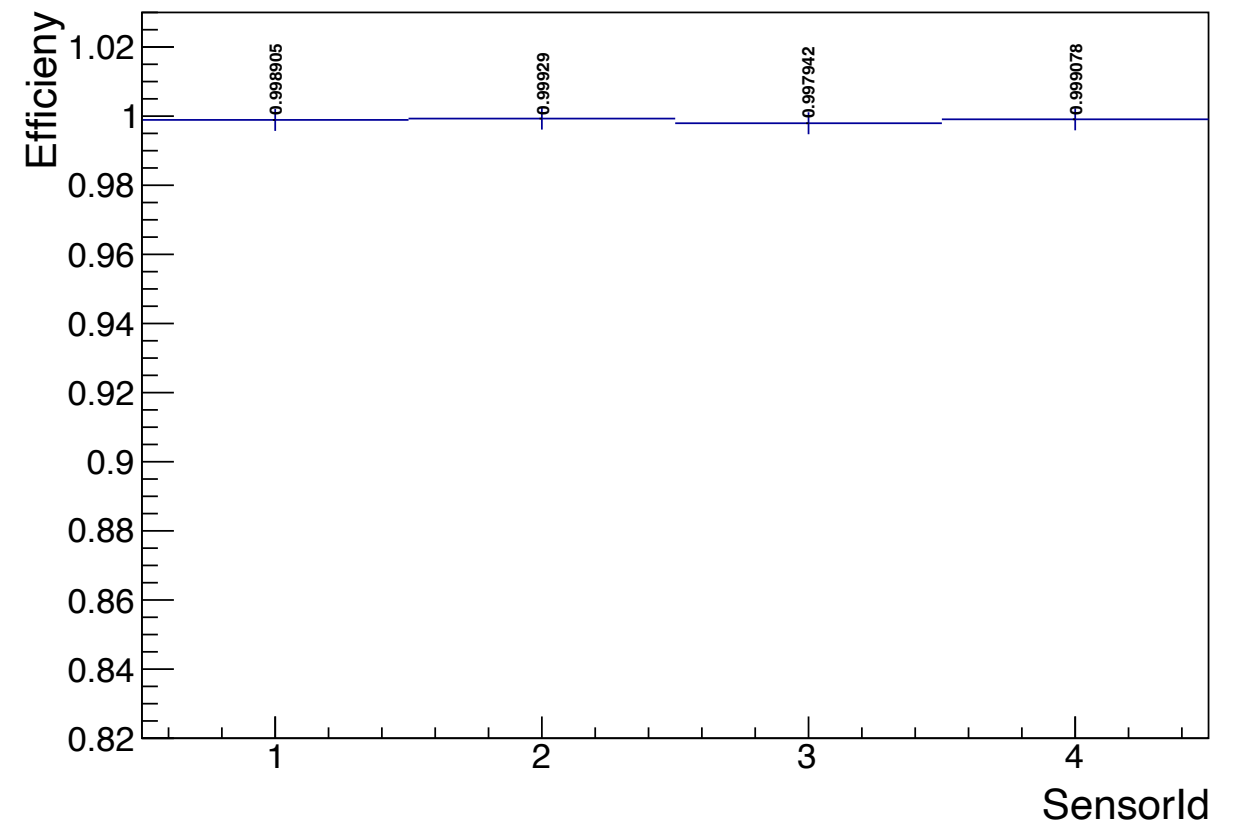
- Definition:
$$\epsilon(sensor) = \frac{1}{tracks} \sum_{i=0}^{tracks} \sum_{c=0}^{clusters} clus_c(sensor)$$
- Per sensor:

GSI2021 - run 4306



Raw Data

GSI2021_MC - run 400

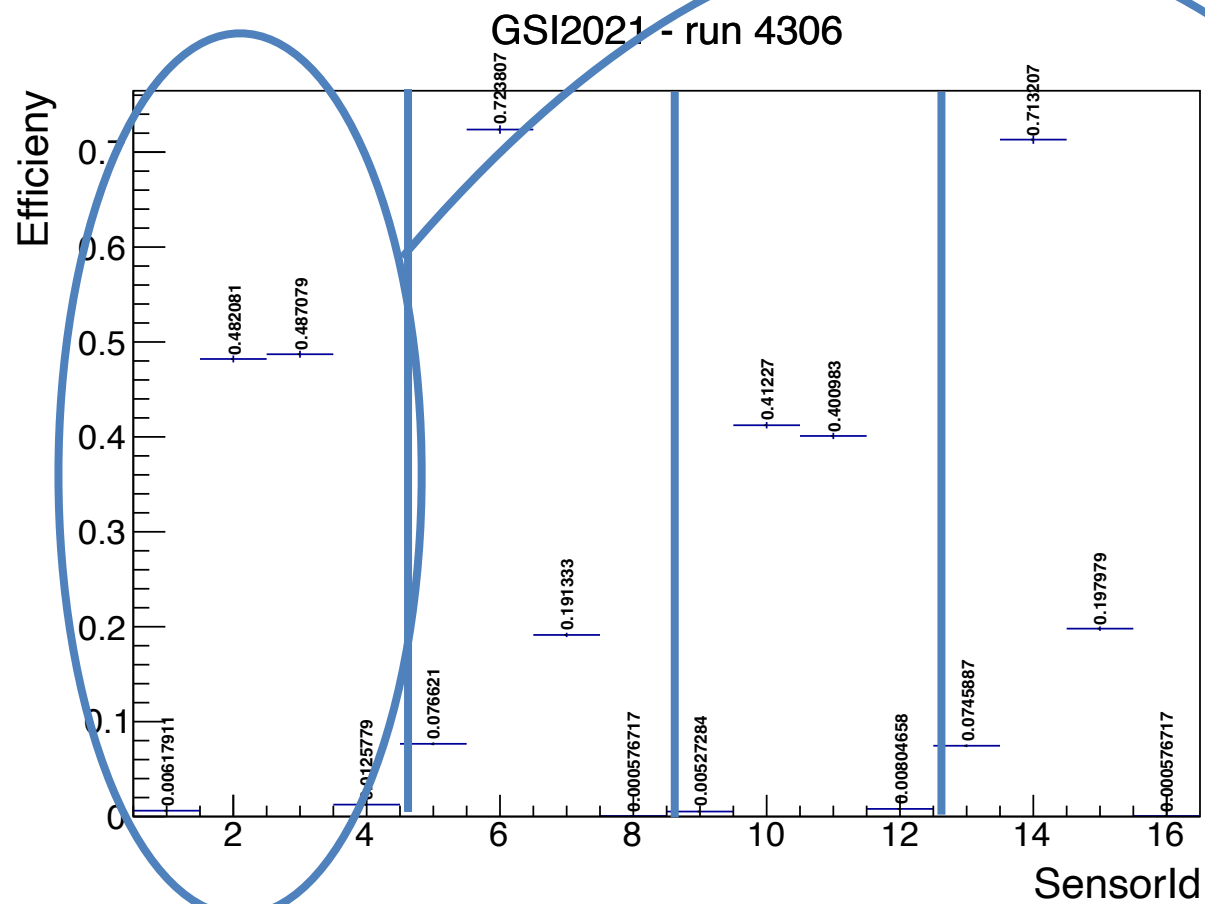


MC Data

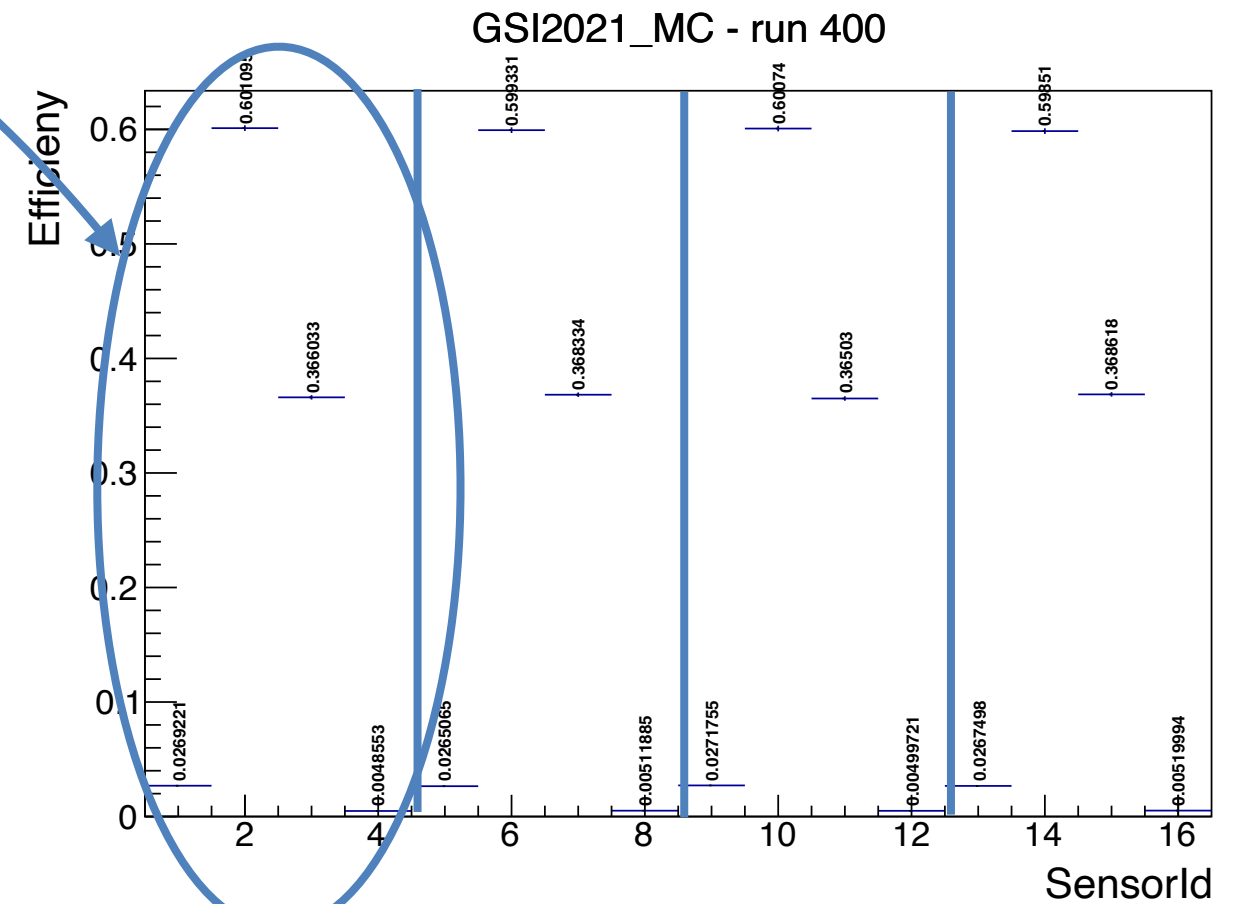
- ➡ Overall efficiency > 99 % except sensor 3 (~82%)
- ➡ Drop of efficiency for sensor 3 (dead pixels) wrt to MC data

Efficiency

- Per quadrant: $\epsilon \sim 100\%$



Raw Data



MC Data

- Distribution of beam hit different in raw data and MC data
- ➡ Dead pixels different

Conclusions & ToDo

- Putting dead pixels in MC is not enough
- Need also to put the “real” shape of the beam in MC
- Need to introduced a general efficiency parameter per sensor.