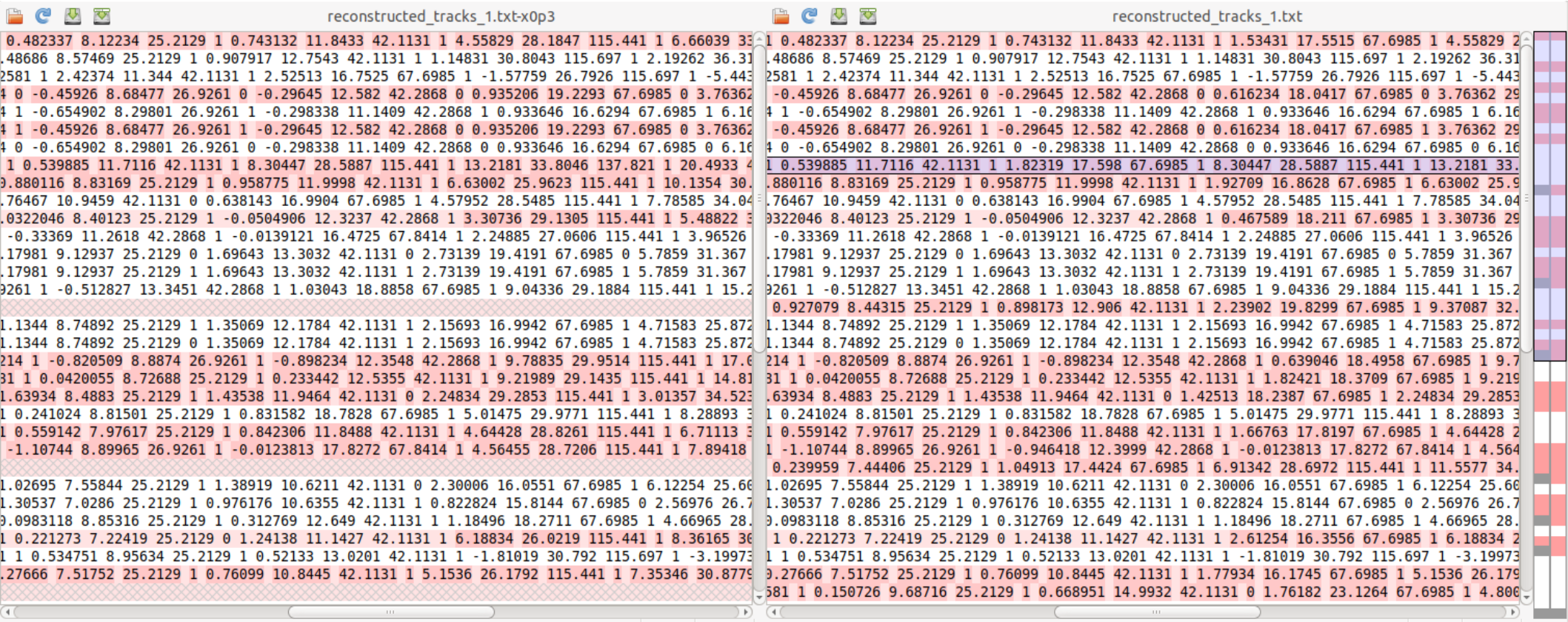
Si/GEM efficiency

- GEM2 bug search
- Results of GEM2 bug fixing
- The next step

GEM2 bug search

- GEM2 main zone low efficiency obtained both for Data and MC. So it is not the detector inefficiency. It is inefficiency of tracking
- Two possible reasons: hits are not reconstructed or hits are not attaching to the tracks
- Check that hits are well reconstructed (match StsPoint and StsHit, ~90%)
- GEM2 hits are attaching to the tracks on the 2-nd tracking stage (in the ExtendTracks_r7v2.C macro)
- Using cout to find misusing KDTree::FindNearestNeighbors() method results (result with the index 0 was not used)

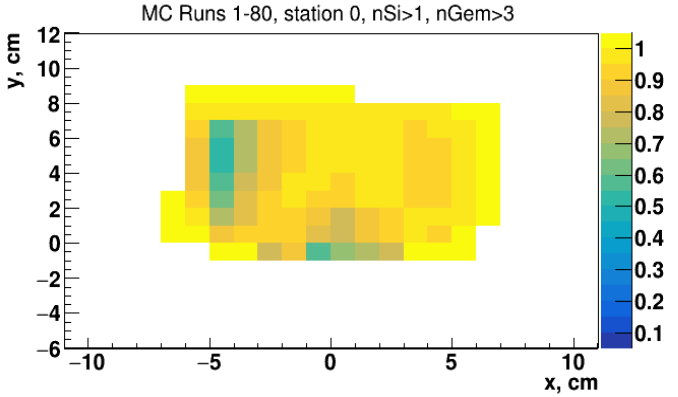
Results of GEM2 bug fixing

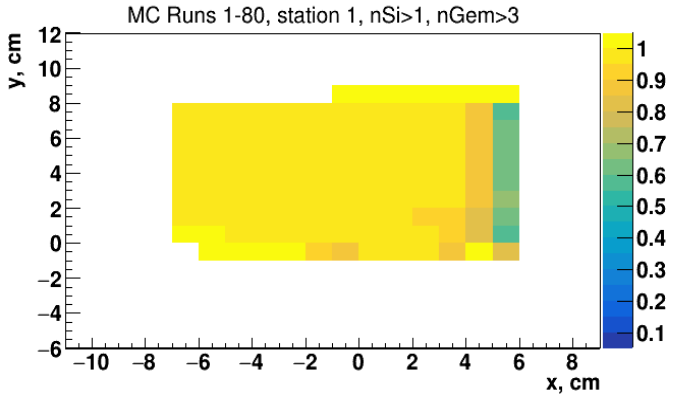


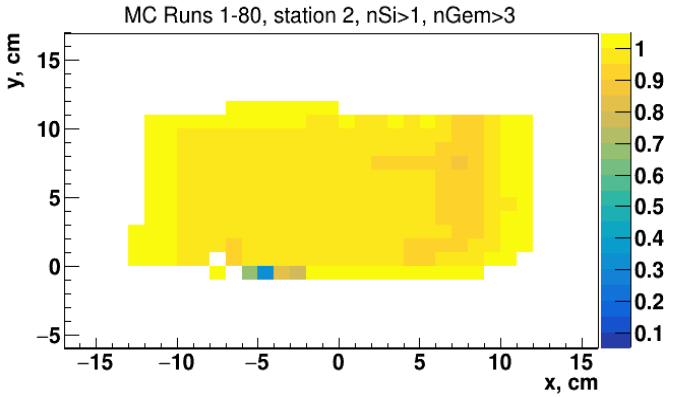
- The number of found good tracks (nSi>1 && nGem>3) in the most affected region (x>0 && x<3 && y>16) increased on ~10%
- The number of attached hits in this region increased on ~40% (in most tracks nHitsPerTrack are increased on 1)

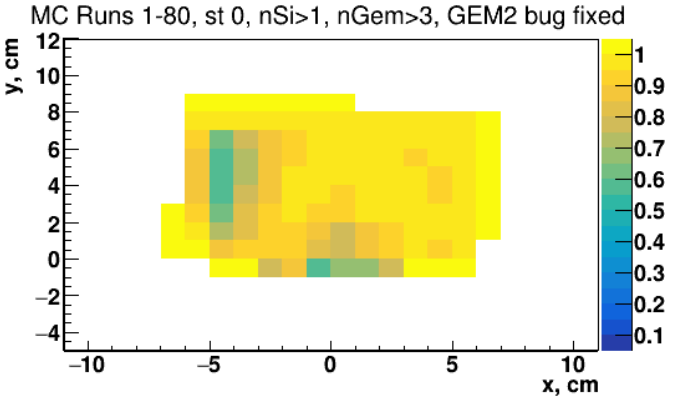
Results of GEM2 bug fixing (MC)

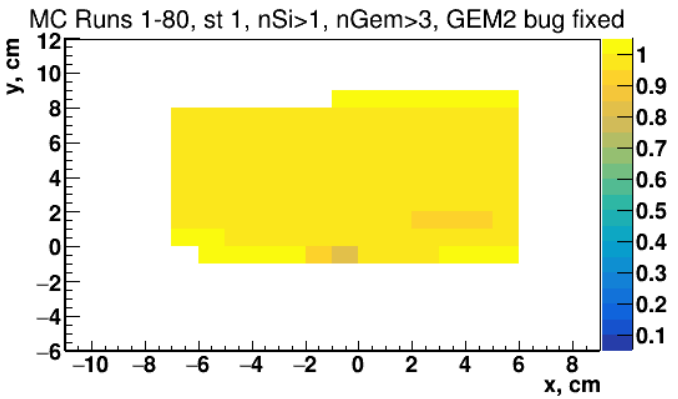
Before bug fixing

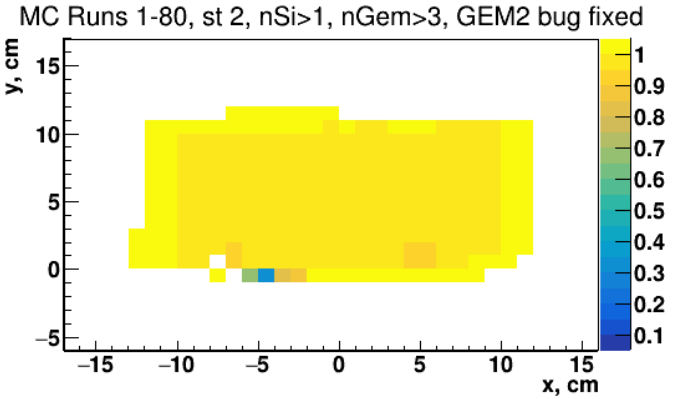








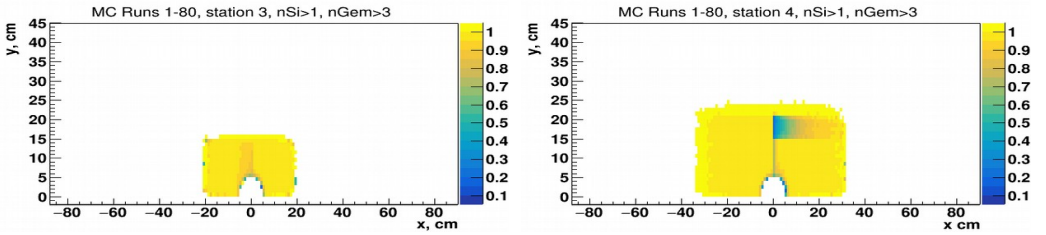




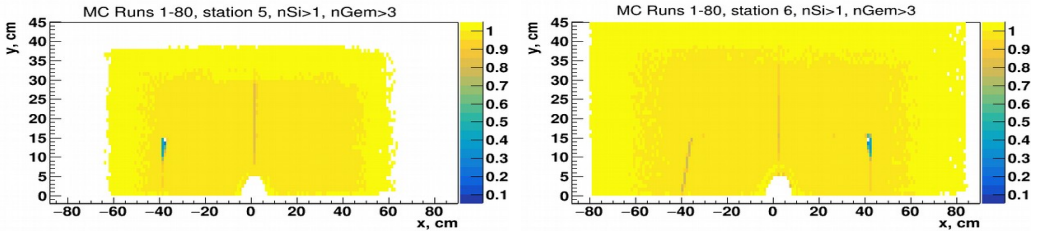
After bug fixing

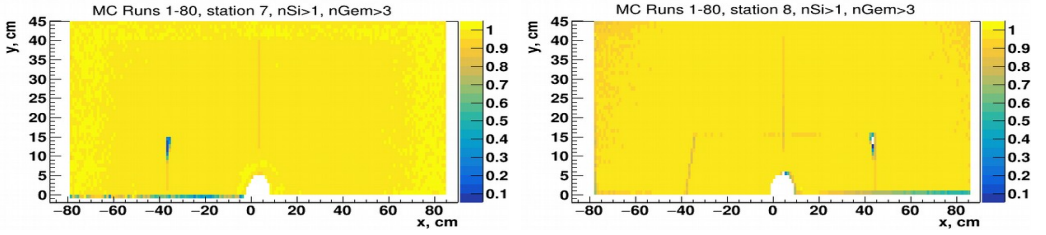
- MC efficiency becomes higher a little for all Si

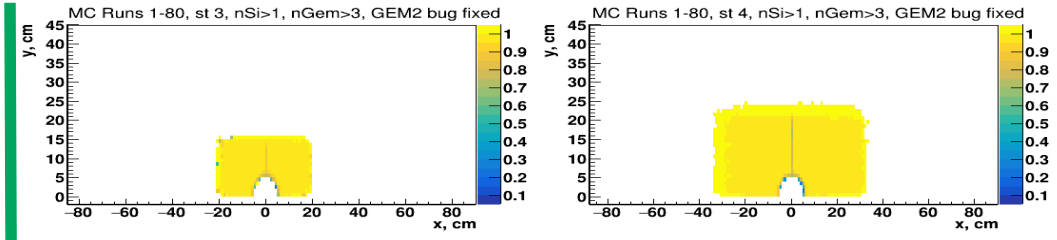
Results of GEM2 bug fixing (MC)



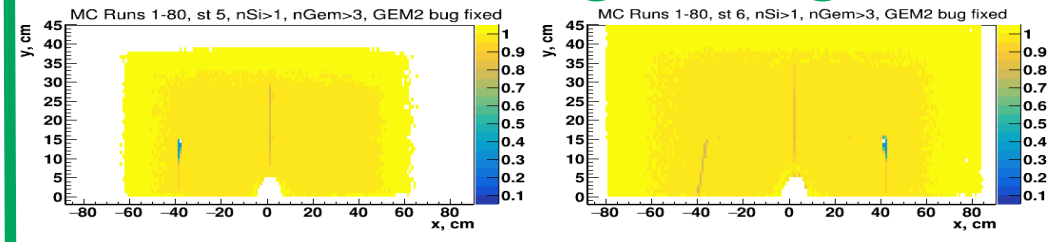
Before bug fixing

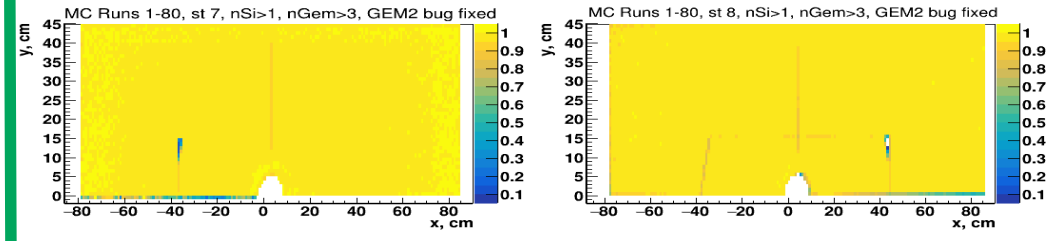






After bug fixing

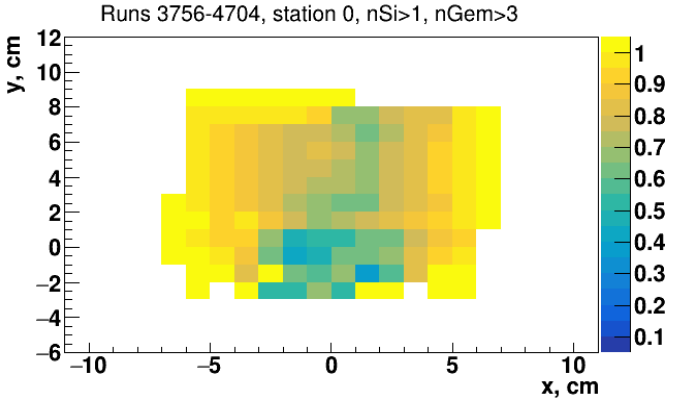


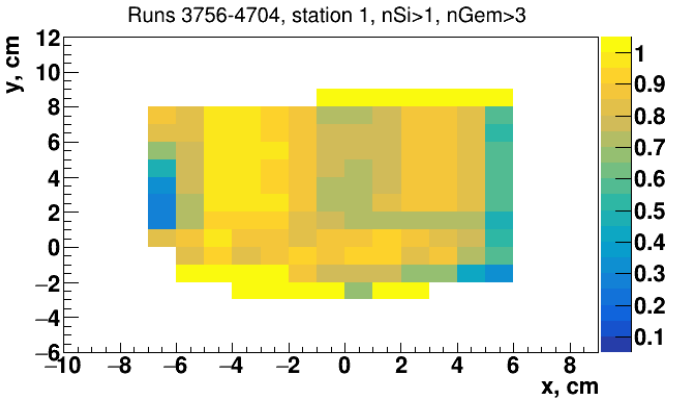


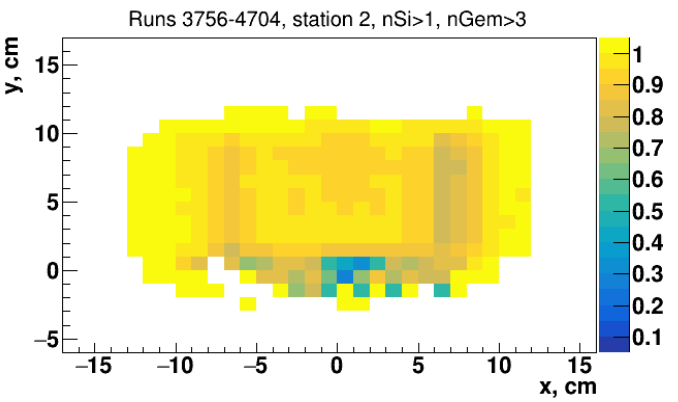
- For GEM1 at X<0, GEM2 at X>0 and top left and right GEM6, efficiency drop are gone
- Most effect is obtained for GEM2

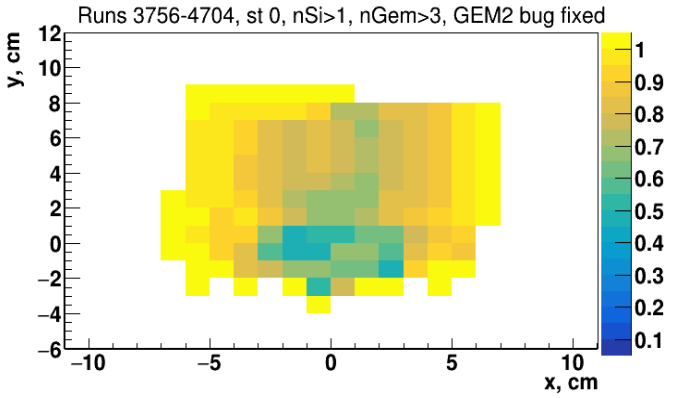
Results of GEM2 bug fixing (Data)

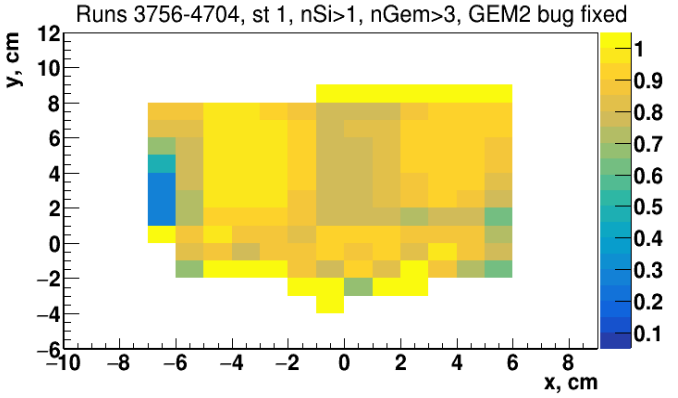
Before bug fixing

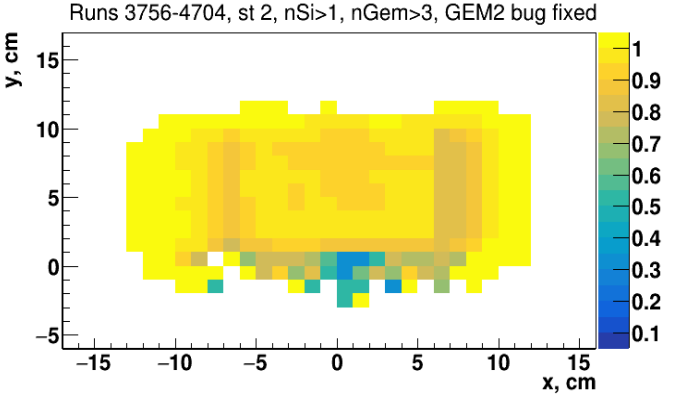








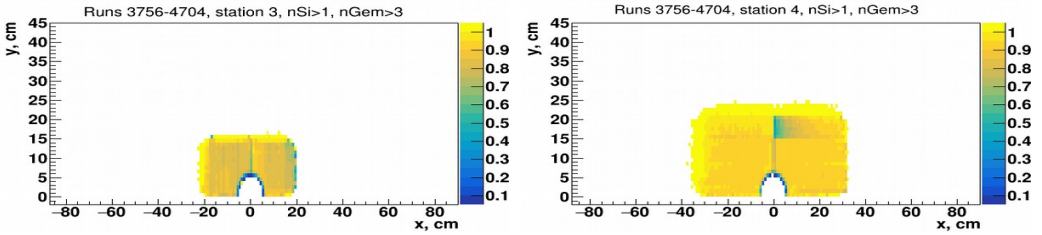




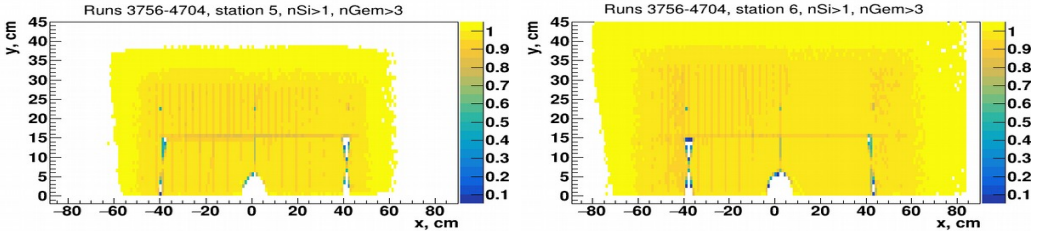
After bug fixing

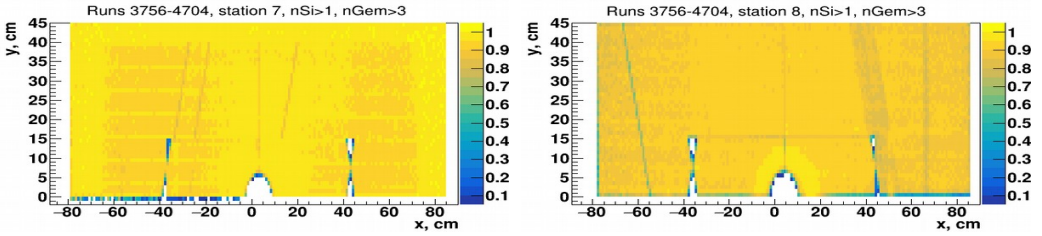
- Data efficiency becomes higher a little for all Si

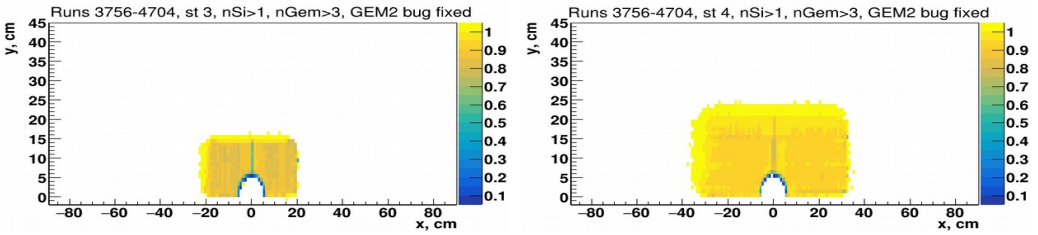
Results of GEM2 bug fixing (Data)



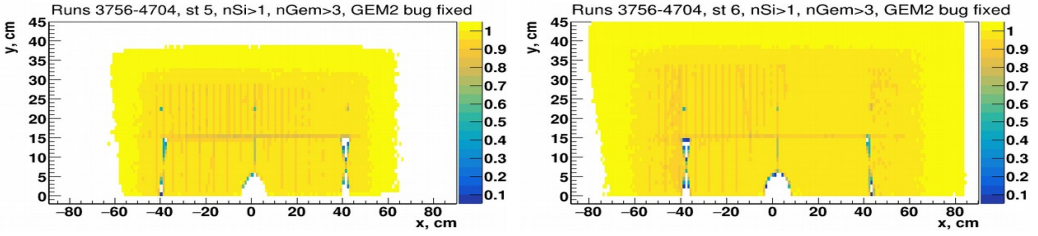
Before bug fixing

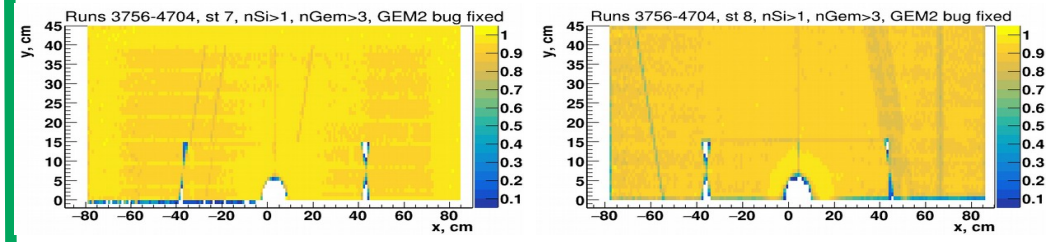






After bug fixing





- For GEM2 at X>0, efficiency drop are gone
- For GEM1, GEM3-GEM6, efficiency practically the same

The next step

- To implement normalized signals for Si/GEM/CSC from Lalyo into MC