

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

reconstructed tracks 1.txt

31 1 0.0420055 8.72688 25.2129 1 0.233442 12.5355 42.1131 1 1.82421 18.3709

0.559142 7.97617 25.2129 1 0.842306 11.8488 42.1131 1 1.66763 17.8197 67.6985

0.241024 8.81501 25.2129 1 0.831582 18.7828 67.6985 1 5.01475 29.9771

25,2129 1 1,43538 11,9464 42,1131 0 1,42513 18,2387 67,6985 1 2,24834

1 1.38919 10.6211 42.1131 0 2.30006 16.0551 67.6985 1 6.12254 25.60

1.18496 18.2711 67.6985

1 -1.10744 8.89965 26.9261 1 -0.946418 12.3999 42.2868 1 -0.0123813 17.8272 67.8414 1 4.564 0.239959 7.44406 25.2129 1 1.04913 17.4424 67.6985 1 6.91342 28.6972 115.441 1 11.5577 34

42 1131

7.22419 25.2129 0 1.24138 11.1427 42.1131 1 2.61254 16.3556 67.6985

12.649 42.1131

581 1 0.150726 9.68716 25.2129 1 0.668951 14.9932 42.1131 0 1.76182 23.1264 67.6985



0 1.35069 12.1784 42.1131 1 2.15693 16.9942 67.6985 1 4.71583 25.872 1.1344 8.74892 25.2129 0 1.35069 12.1784 42.1131 1 2.15693 16.9942 67.6985 -0.898234 12.3548 42.2868 1 9.78835 29.9514 115.441 1 17. 214 1 -0.820509 8.8874 26.9261 1 -0.898234 12.3548 42.2868 1 0.639046 18.4958 0.233442 12.5355 42.1131 1 9.21989 29.1435 115.441 1 14.81 25,2129 1 1,43538 11,9464 42,1131 0 2,24834 29,2853 115,441 1 3,01357 34,523 0.241024 8.81501 25.2129 1 0.831582 18.7828 67.6985 1 5.01475 29.9771 115.441 1 8.28893 0.559142 7.97617 25.2129 1 0.842306 11.8488 42.1131 1 4.64428 28.8261 115.441 1 6.71113 3 -1.10744 8.89965 26.9261 1 -0.0123813 17.8272 67.8414 1 4.56455 28.7206 115.441 1 7.89418

2129 1 1.38919 10.6211 42.1131 0 2.30006 16.0551 67.6985 1 6.12254 25.66 1.02695 7.55844 25.2129 0 976176 10 6355 42 1131 0.822824 15.8144 67.6985 0 2.56976 26.7 1.30537 7.0286 25.2129 25.2129 1 0.312769 12.649 42.1131 1 1.18496 18.2711 67.6985 1 4.66965 28. 7.22419 25.2129 0 1.24138 11.1427 42.1131 1 6.18834 26.0219 115.441 1 8.36165 36 1 0.534751 8.95634 25.2129 1 0.52133 13.0201 42.1131 1 -1.81019 30.792 115.697 1 -3.19973 1 1 0.534751 8.95634 25.2129 1 0.52133 13.0201 42.1131 1 -1.81019 30.792 115.697 27666 7.51752 25.2129 1 0.76099 10.8445 42.1131 1 5.1536 26.1792 115.441 1 7.35346 30.877 0.27666 7.51752 25.2129 1 0.76099 10.8445 42.1131 1 1.77934 16.1745 67.6985 1

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

63934

- 1

1

8 4883

0.0983118 8.85316 25.2129 1 0.312769

 The number of attached hits in this region increased on ~40% (in most tracks nHitsPerTrack are increased on 1)

1 6.16

31.367

1 15.2

25.872

4.66965 28.

Results of GEM2 bug fixing (MC) Before bug fixing

BM@N



• MC efficiency becomes higher a little for all Si

Results of GEM2 bug fixing (MC)



- 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

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Results of GEM2 bug fixing (Data) Before bug fixing



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• Data efficiency becomes higher a little for all Si

Results of GEM2 bug fixing (Data)



- 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

