CSC Segment Builder status

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CSC Weekly Meeting

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Current Status

- Algorithm's description & Performance with MC data:

https://indico.cern.ch/event/388966/contribution/4/attachments/777650/1066373/15_04_22-Voytishin_Palichik-CSCSegBuilder_fixed_sumw.pdf

- The RoadUsage(RU) CSC Segment Building algorithm update implemented;

- RU segment builder - the default CSC segment builder, starting with 9_0_0_pre5.

Software & Data

- CMSSW_8_11_0 for Collision data (TnP analyzer works for this release)
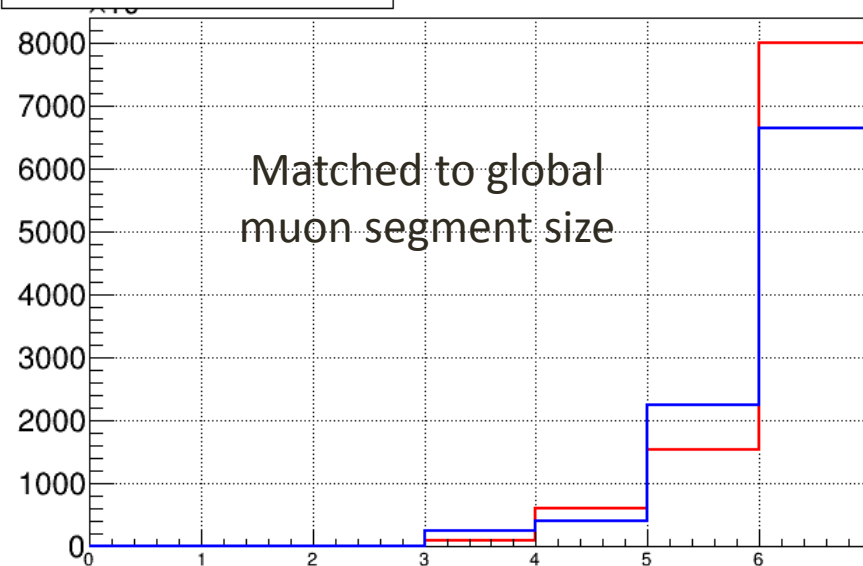 - /SingleMuon/Run2016H-ZMu-PromptReco-v2/RAW-RECO
    - ~9M events;

Nsegments

Segment multiplicity
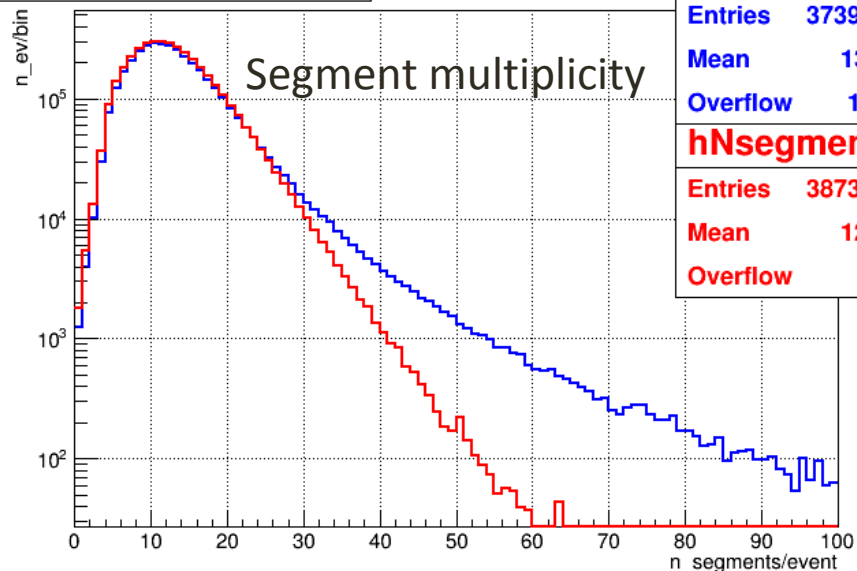
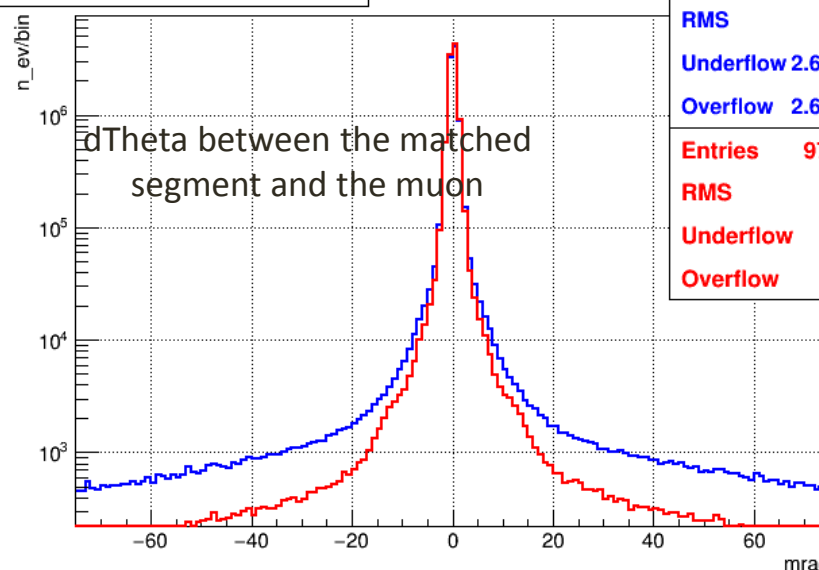| hNsegments	
Entries	3739835
Mean	13.48
Overflow	1275
hNsegments	
Entries	3873373
Mean	12.69
Overflow	0

Nhits per matched segment

Matched to global muon segment size

dPhi (in strips) between matched segment and the track trajectory

dPhi between the matched segment and the muon
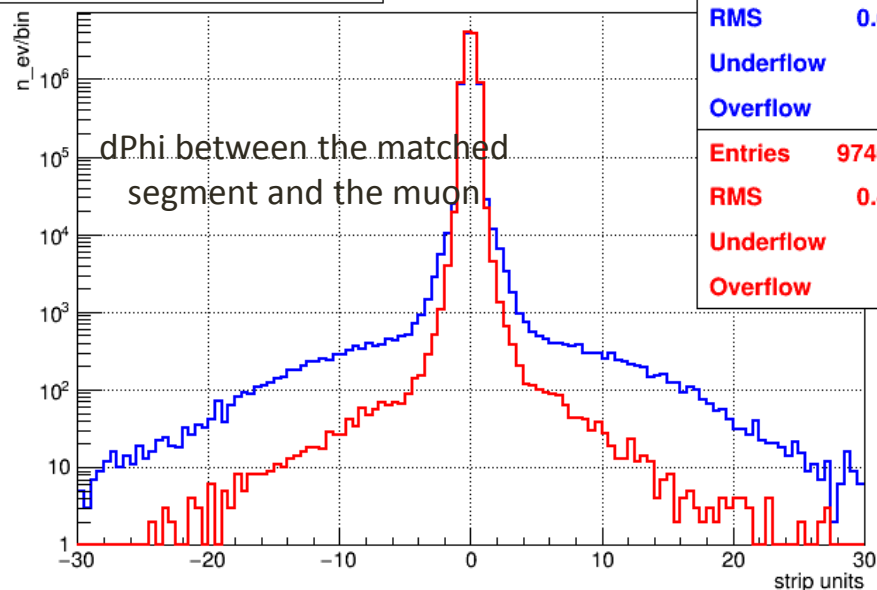
Entries	9525755
RMS	0.6064
Underflow	98
Overflow	101
Entries	9740486
RMS	0.4005
Underflow	23
Overflow	26

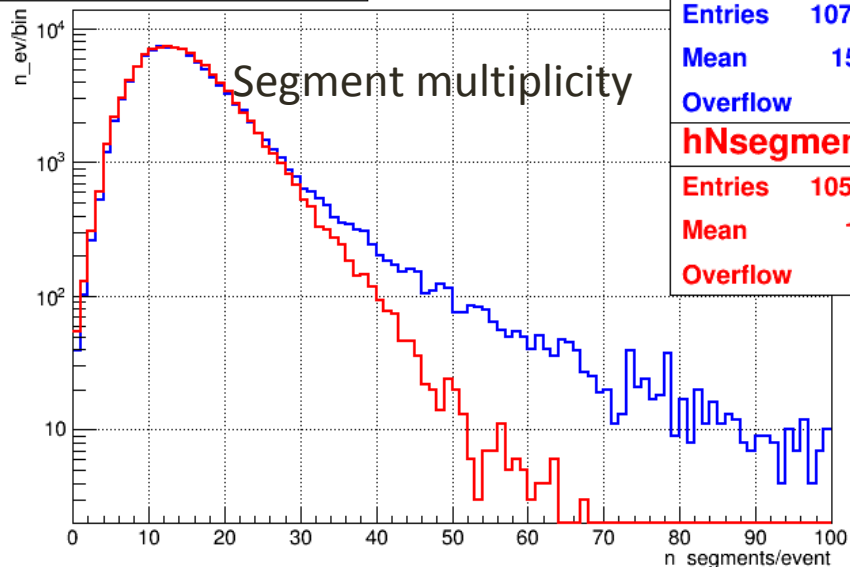dTheta between matched segment and the track trajectory

dTheta between the matched segment and the muon

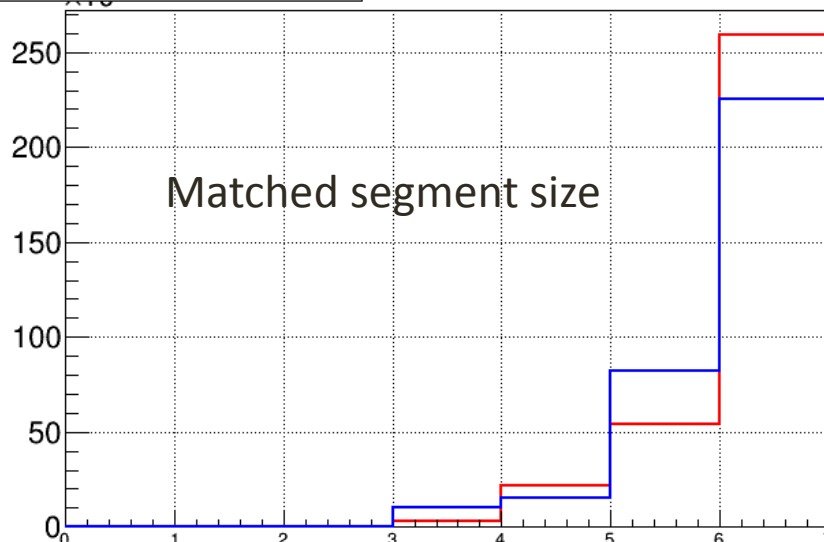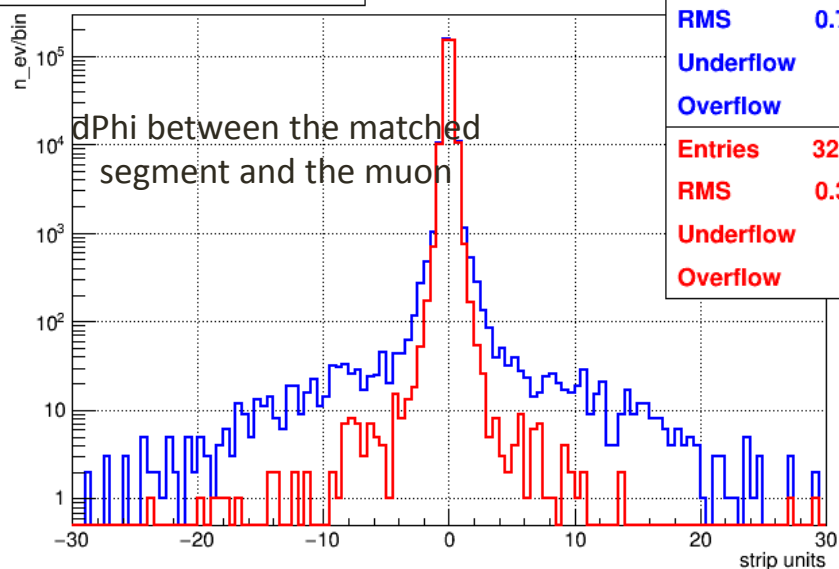| Entries	9525755
RMS	4.694
Underflow	2.645e+04
Overflow	2.653e+04
Entries	9740486
RMS	2.888
Underflow	8892
Overflow	8962

blue – ST algorithm; red – NEW algorithm.

Nsegments

Segment multiplicity

hNsegments	
Entries	107822
Mean	15.87
Overflow	206
hNsegments	
Entries	105379
Mean	14.6
Overflow	0

n_segments/event

Nhits per matched segment

Matched segment size

dPhi (in strips) between matched segment and the track trajectory

dPhi between the matched segment and the muon

Entries	333747
RMS	0.7276
Underflow	14
Overflow	12
Entries	322511
RMS	0.3388
Underflow	2
Overflow	1

strip units
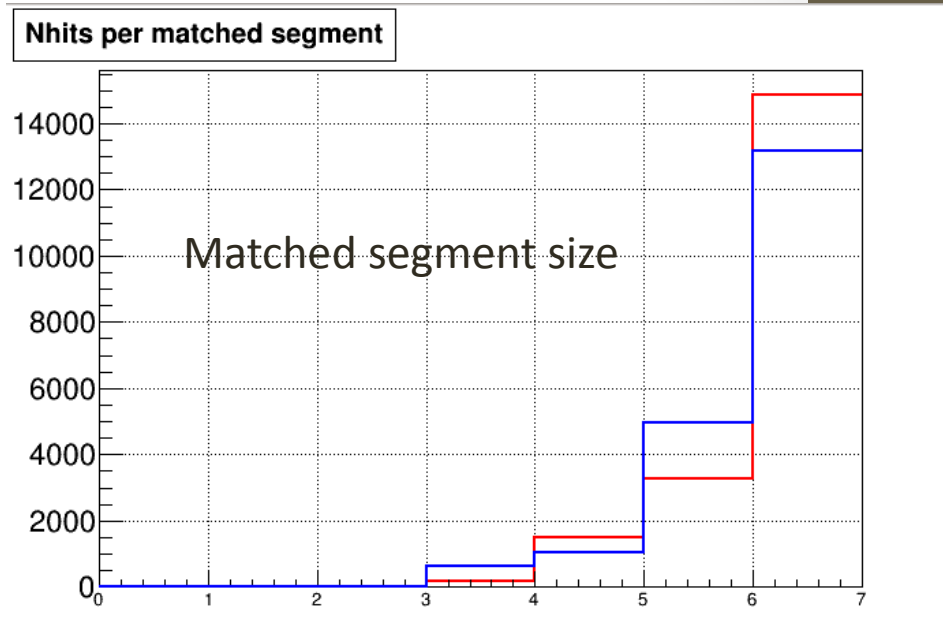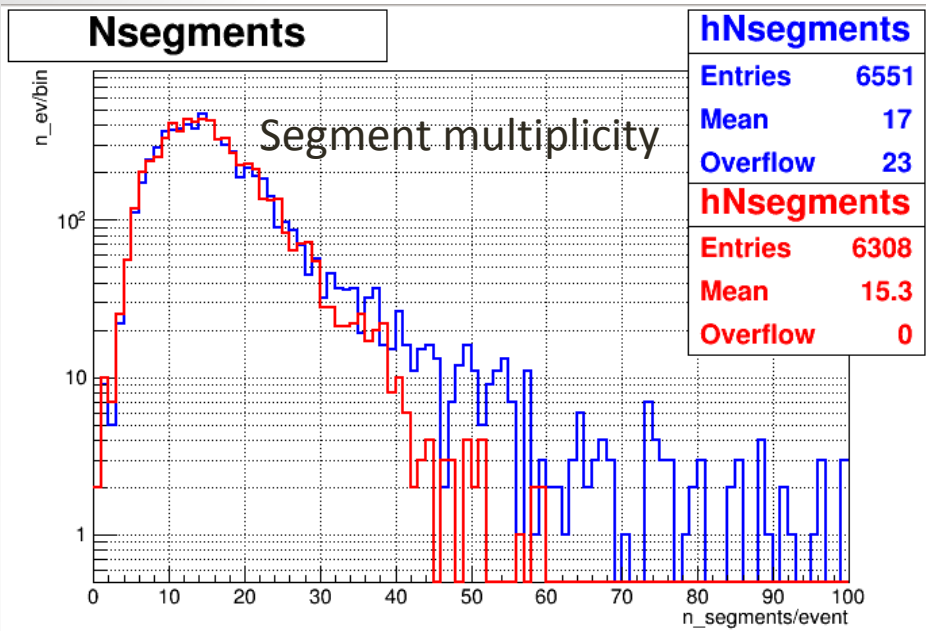
dTheta between matched segment and the track trajectory

dTheta between the matched segment and the muon
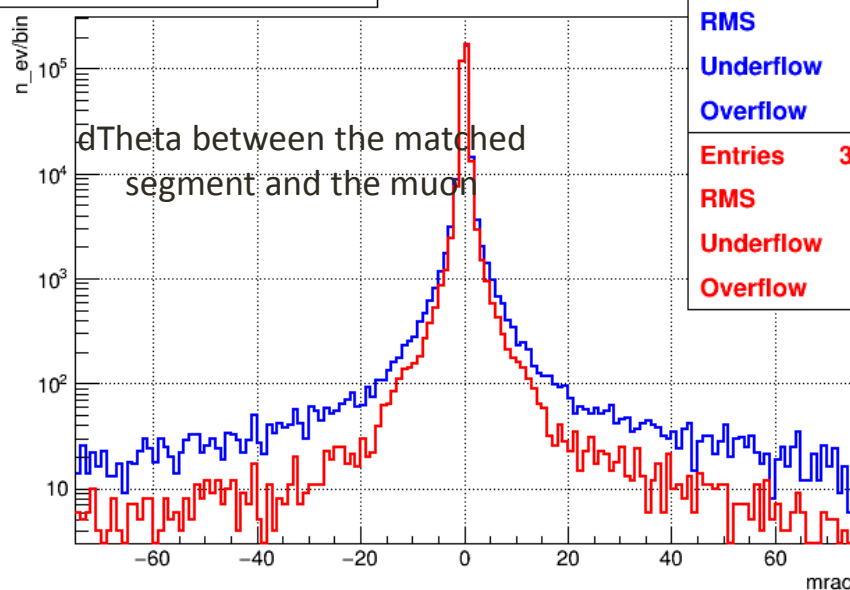
Entries	333747
RMS	4.868
Underflow	711
Overflow	745
Entries	322511
RMS	2.864
Underflow	203
Overflow	234

mrad

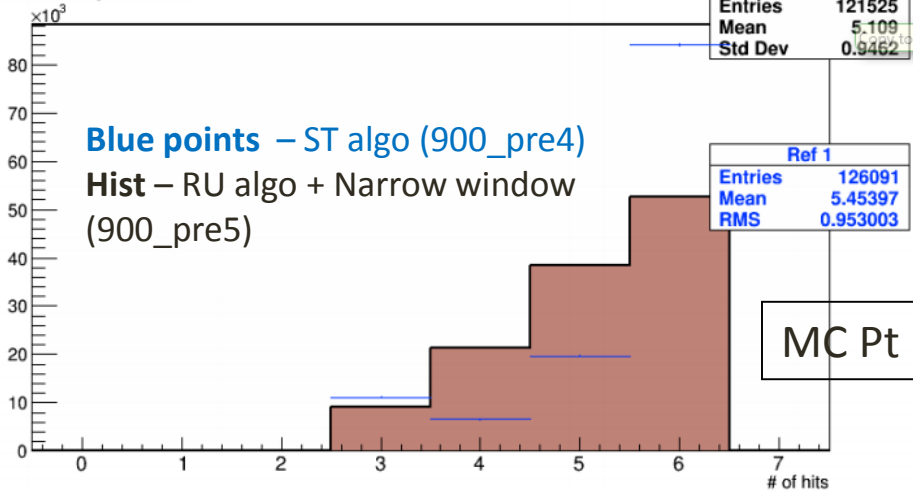blue – ST algorithm; red – NEW algorithm.
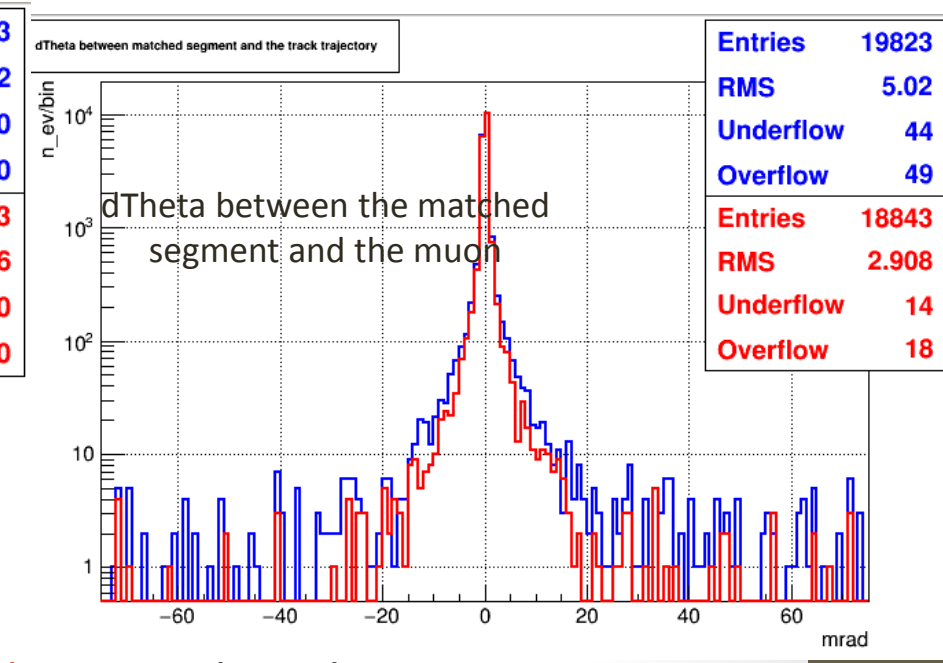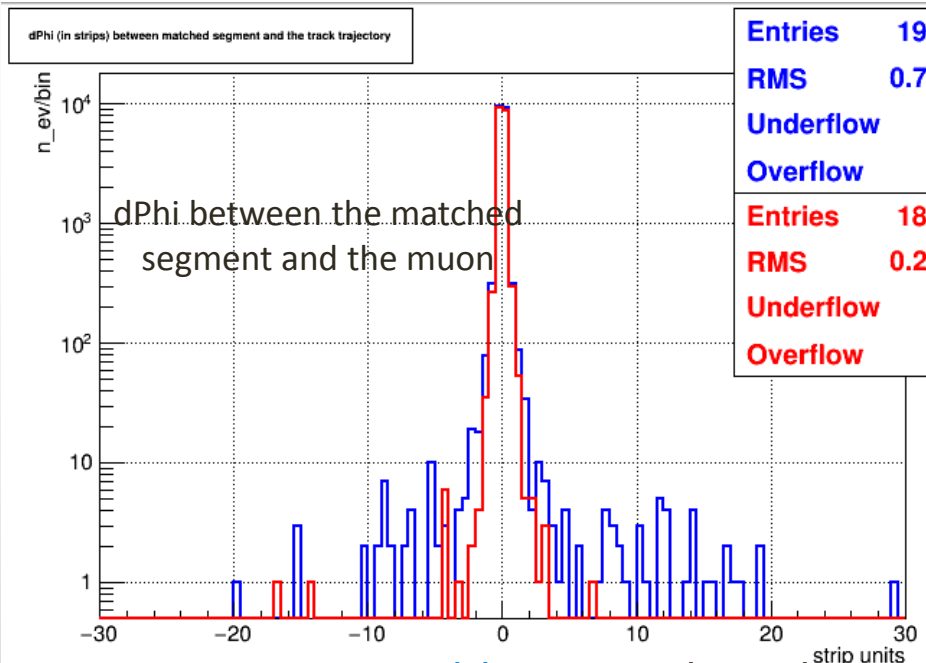
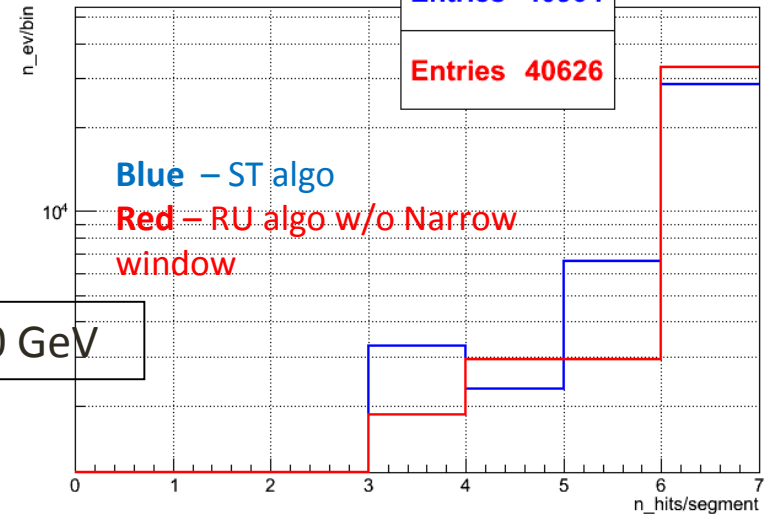blue – ST algorithm; red – NEW algorithm.

Narrow anode time window

Pic from last week Tim's talk
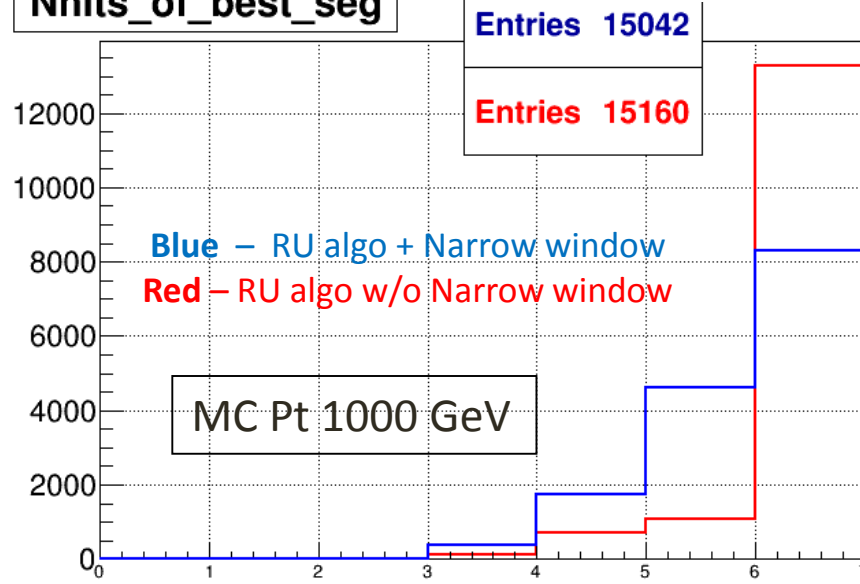
ST vs. RU w/o anode time window

N hits on Segments

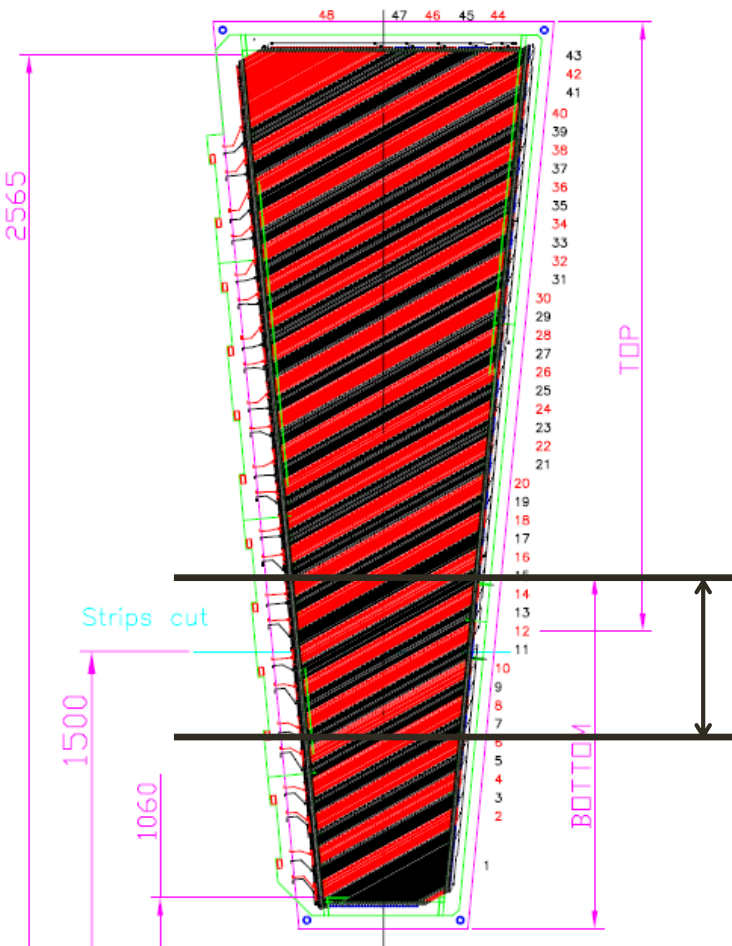| hSnhits	
Entries	121525
Mean	5.109
Std Dev	0.9462

Ref 1	
Entries	126091
Mean	5.45397
RMS	0.953003

Blue points – ST algo (900_pre4)
Hist – RU algo + Narrow window (900_pre5)

MC Pt 10 GeV

All segments: Nhits per segment

Entries 40904

Entries 40626

Blue – ST algo
Red – RU algo w/o Narrow window

Nhits_of_best_seg

Entries 15042

Entries 15160

Blue – RU algo + Narrow window
Red – RU algo w/o Narrow window

MC Pt 1000 GeV

7

ME11a/b common WG region
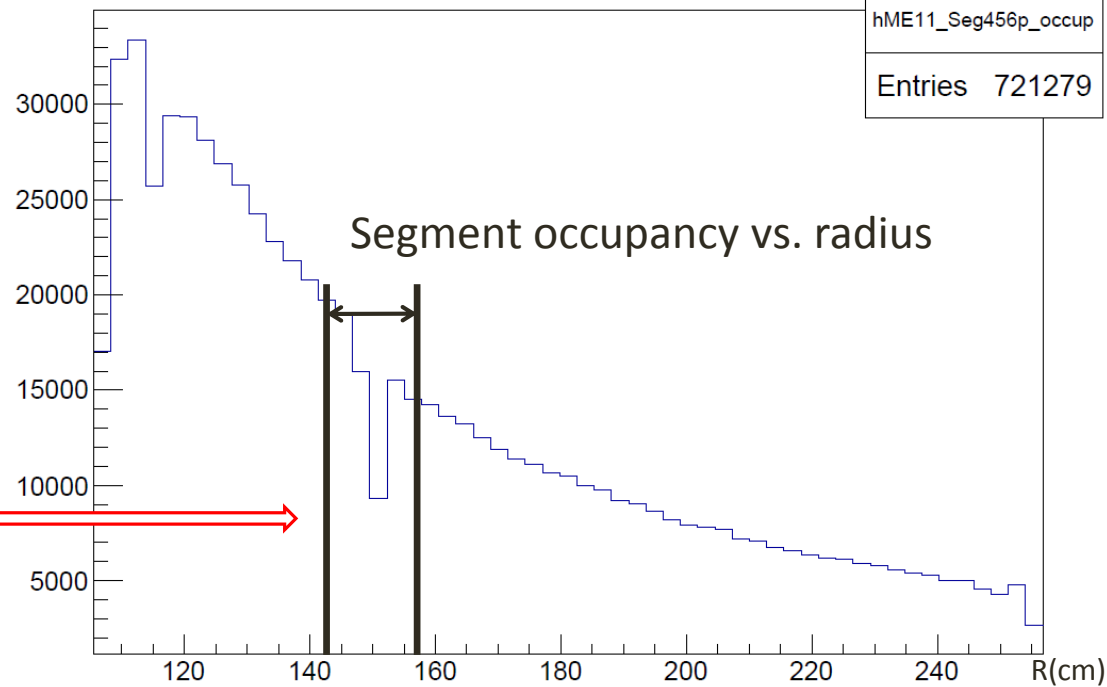
Solution: Pass the combined ME11 a + b RecHit collection to the segment builder instead of two separate collections.

Summary

- CSCSegmentBuilderRU became the default algorithm starting with CMSSW 9_0_0_pre5;

- RU builder shows good results for 2016 collision data;

- Narrower anode time window applied for MC data results in decrease of segment length;

- Fixing ME11 common WG region problem – in progress.