0T Collision tracks in track-based alignment and LA calibration

(+ dR isolation study)

(+ vertex distance study)

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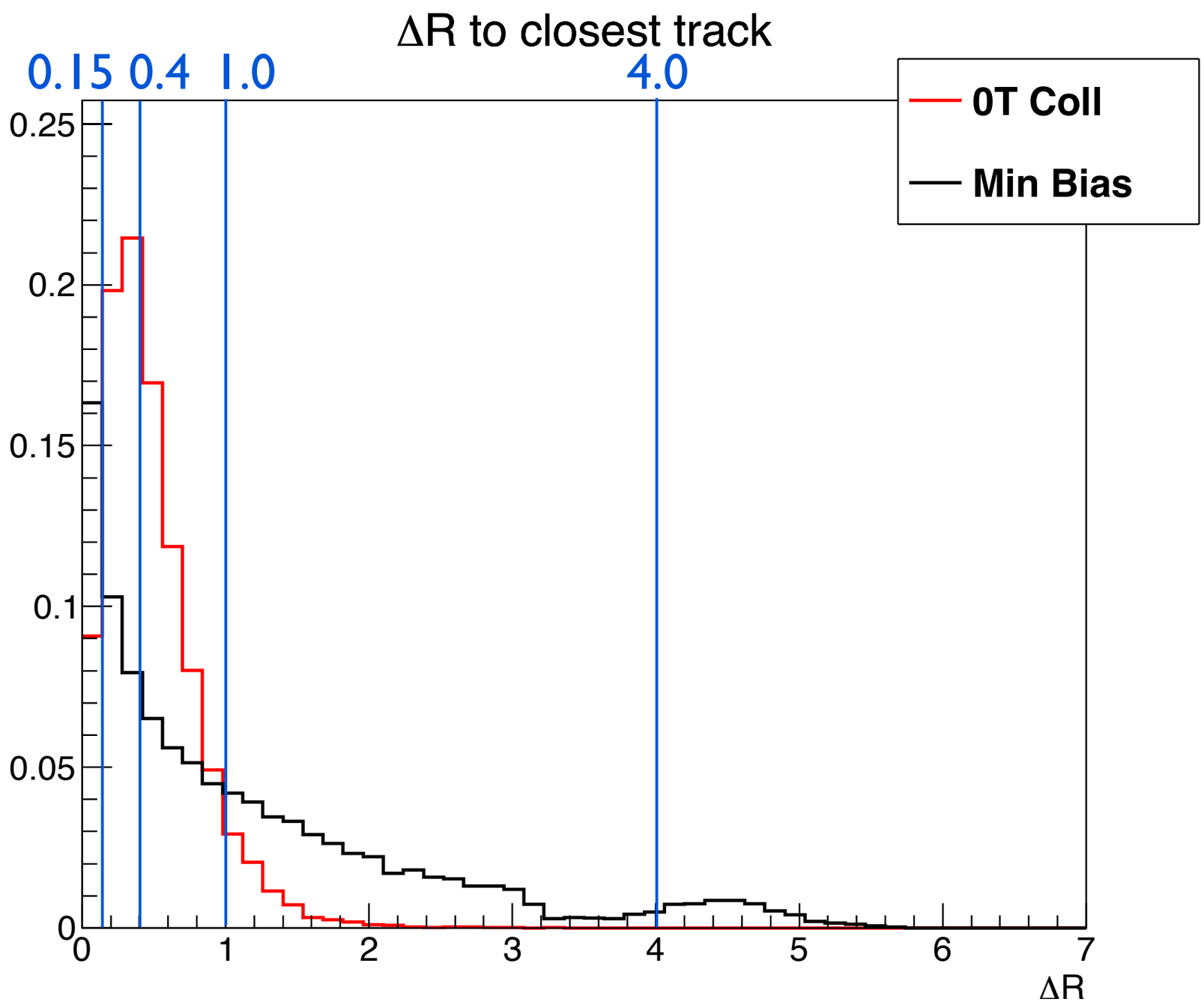
Introduction

- For improvement of criteria for rejection of fake tracks from 0T Collision dataset two approaches have been considered:
  - Require track being isolated from other tracks in some cone;
  - Require track to have small distance to closest primary vertex;

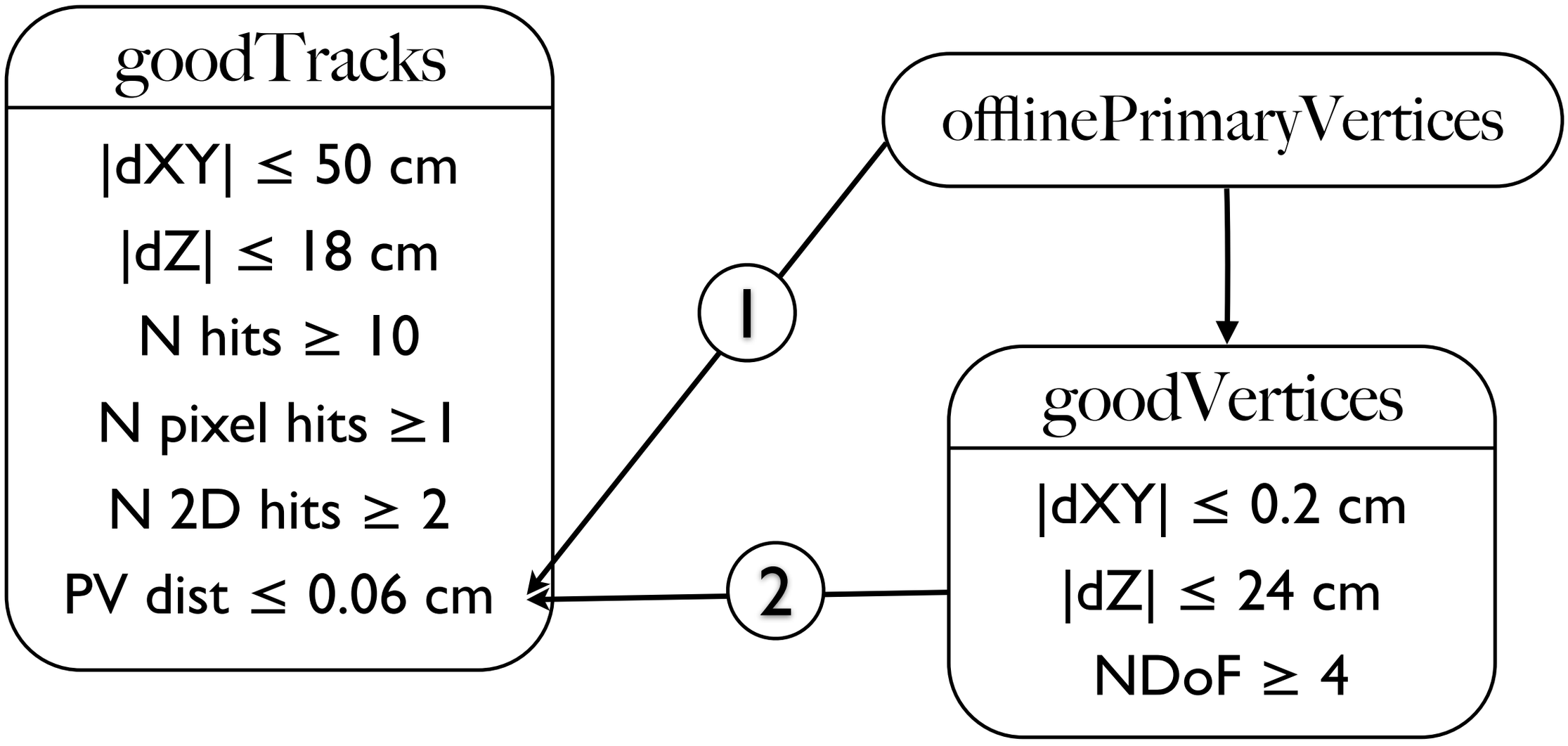
- Dataset details:
  - Datasets: /ZeroBias[1-4]/Run2012C-TkAlMinBias-v2/ALCARECO
  - Run numbers: 201431-201476 : ~60 pb^{-1} : ~200 M tracks

dR Isolation



Next plots will be shown for 4 ranges of dR distribution in order to compare the quality of tracks with different isolation criteria.

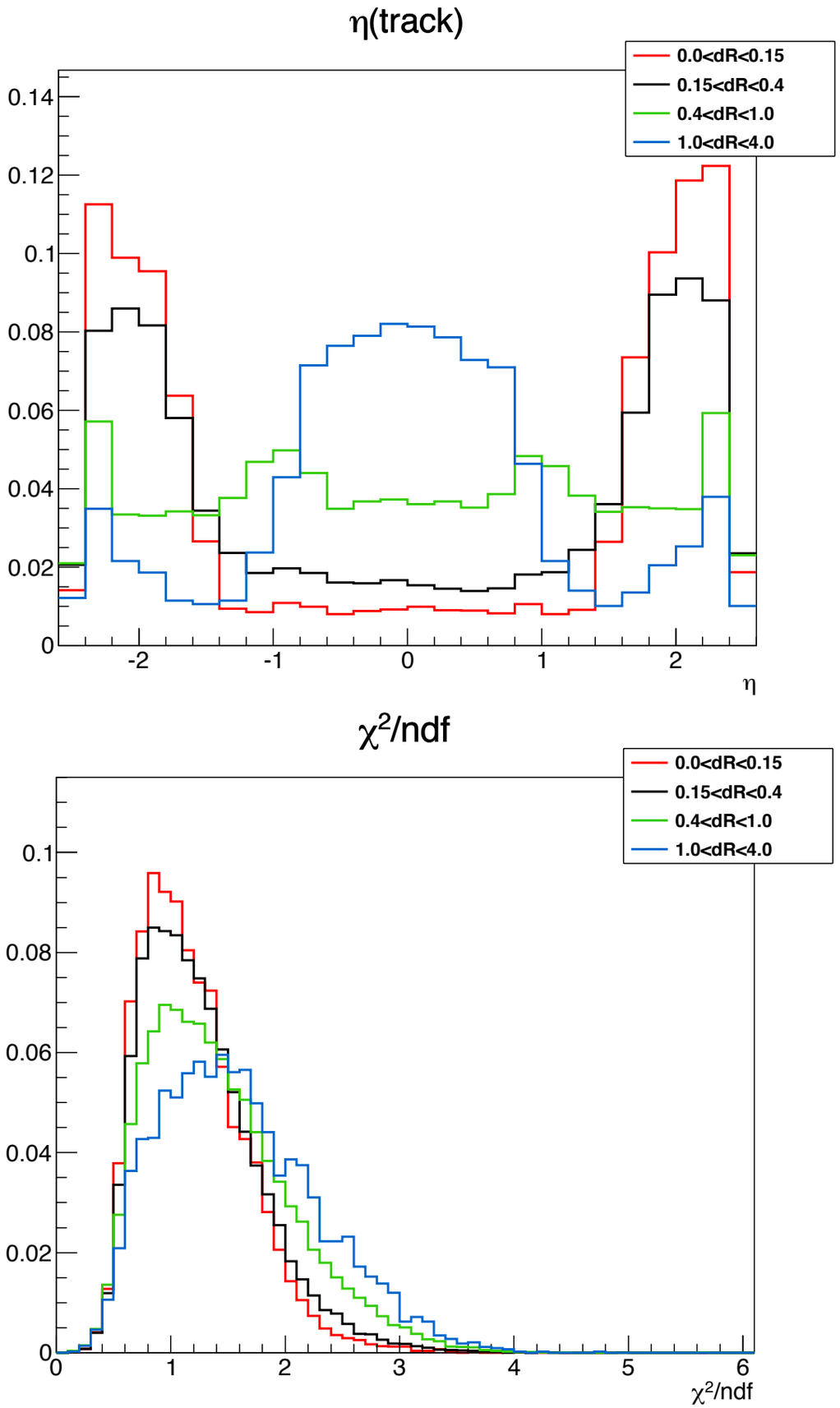
Track selection

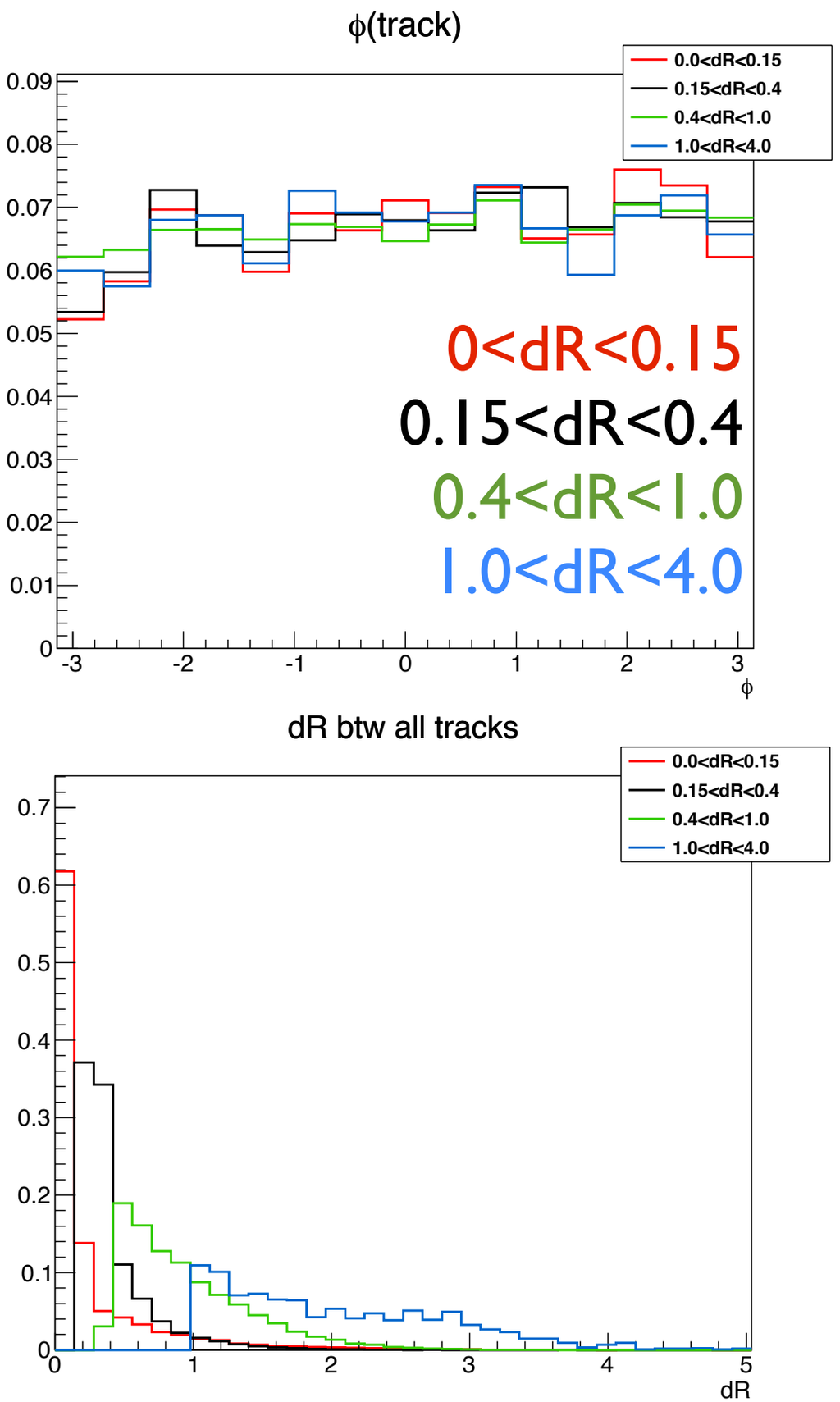


Compared are 2 selections of vertices used in "PV dist" cut:

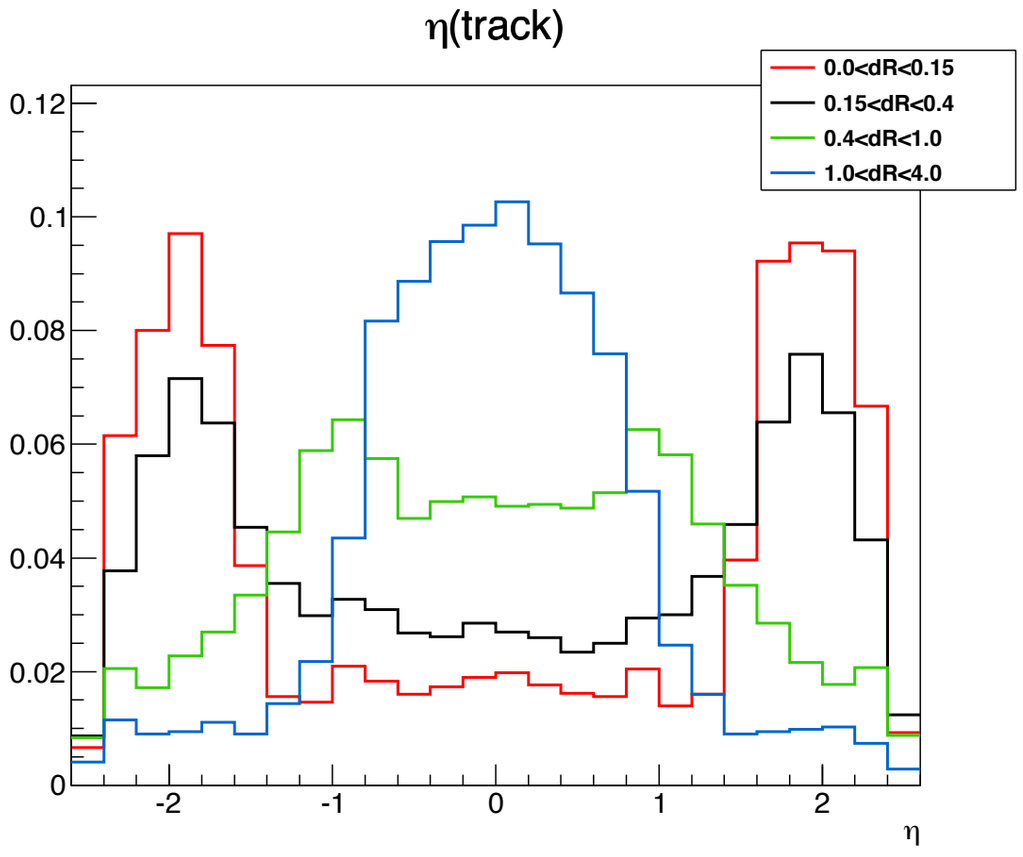
1. goodTracks + offlinePrimaryVertices (default)
2. goodTracks + goodVertices

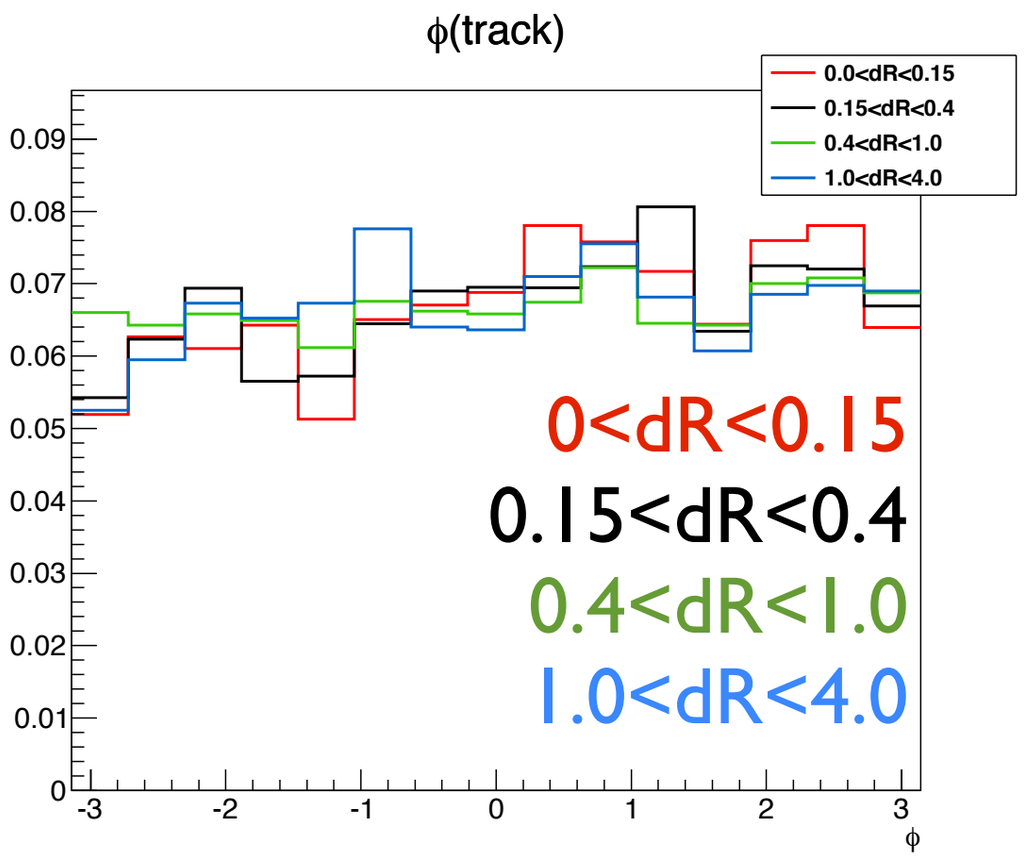
Track distributions: Kinematics

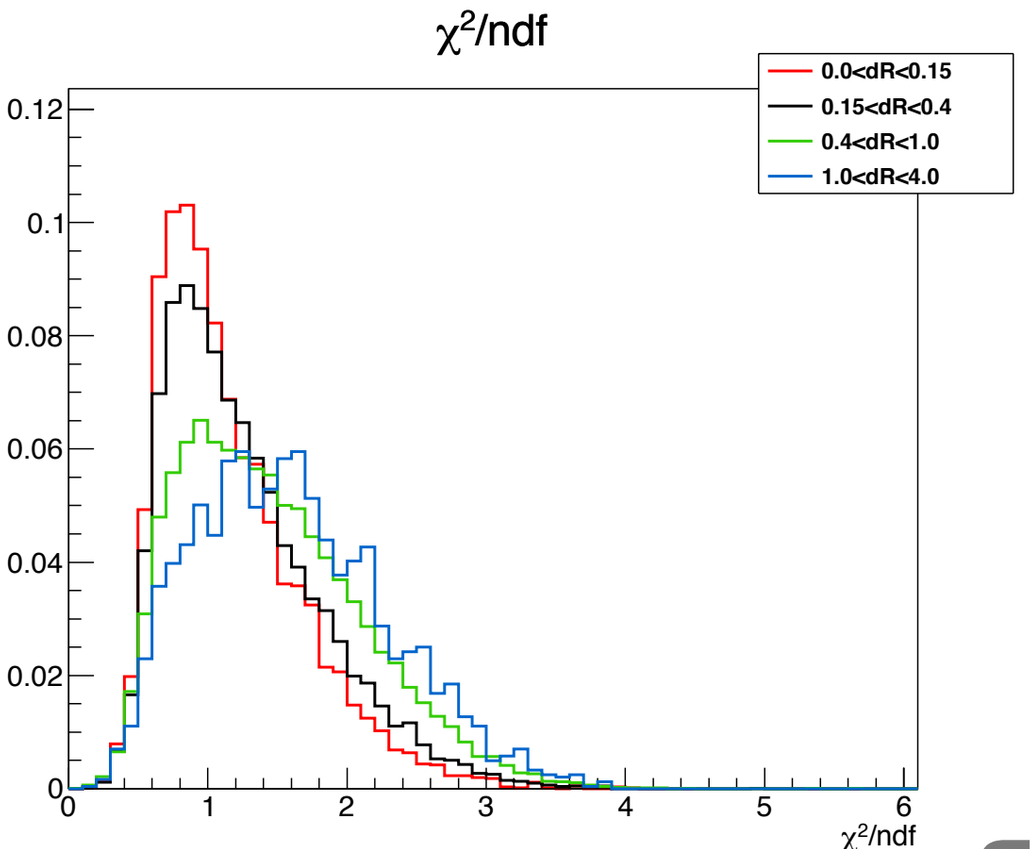


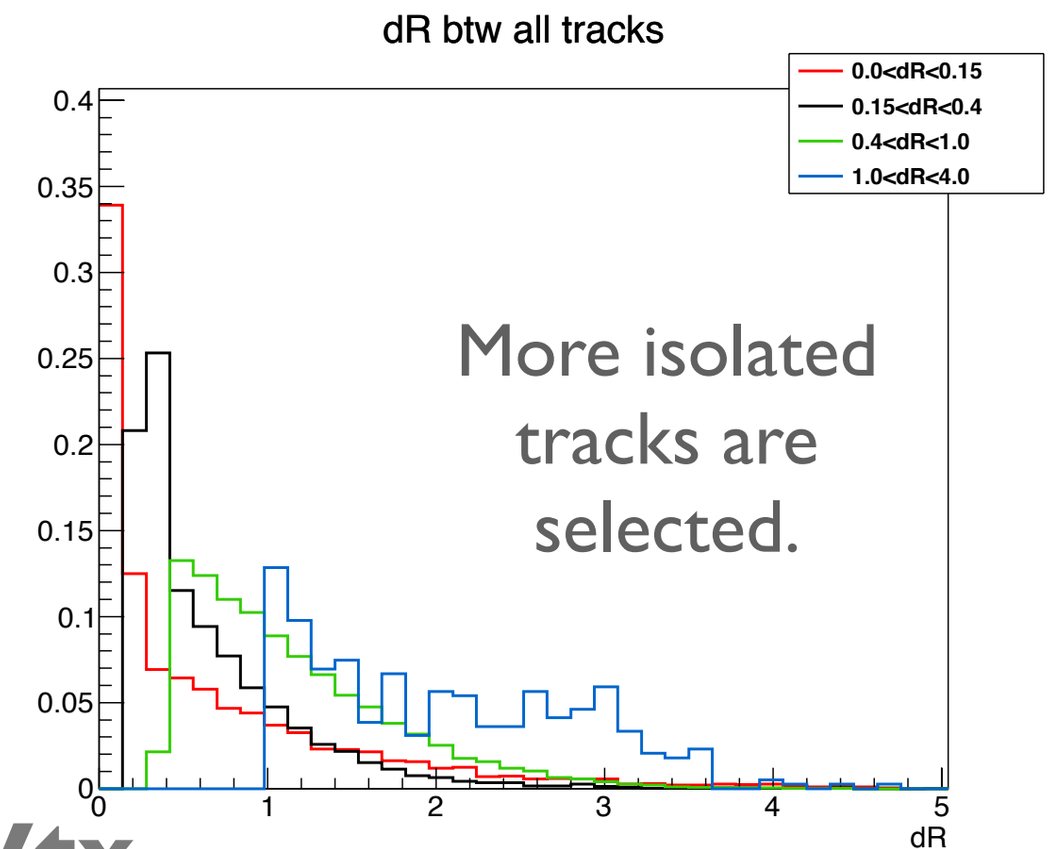


Track distributions: Kinematics





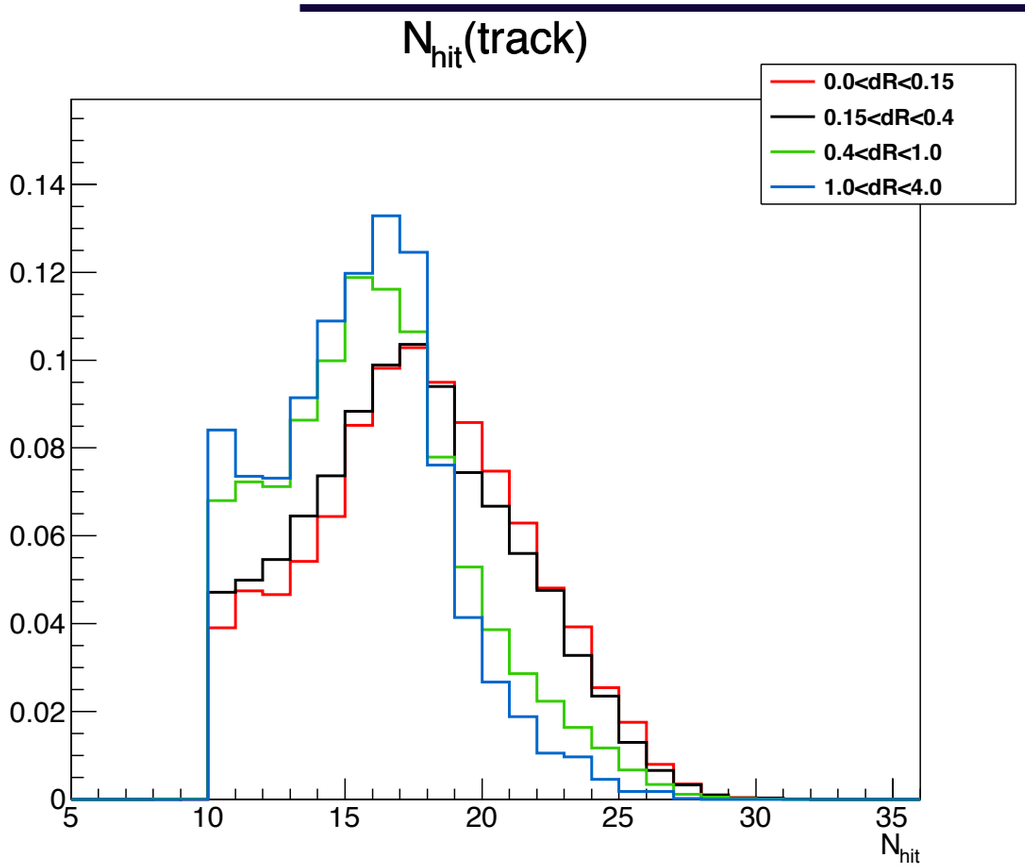


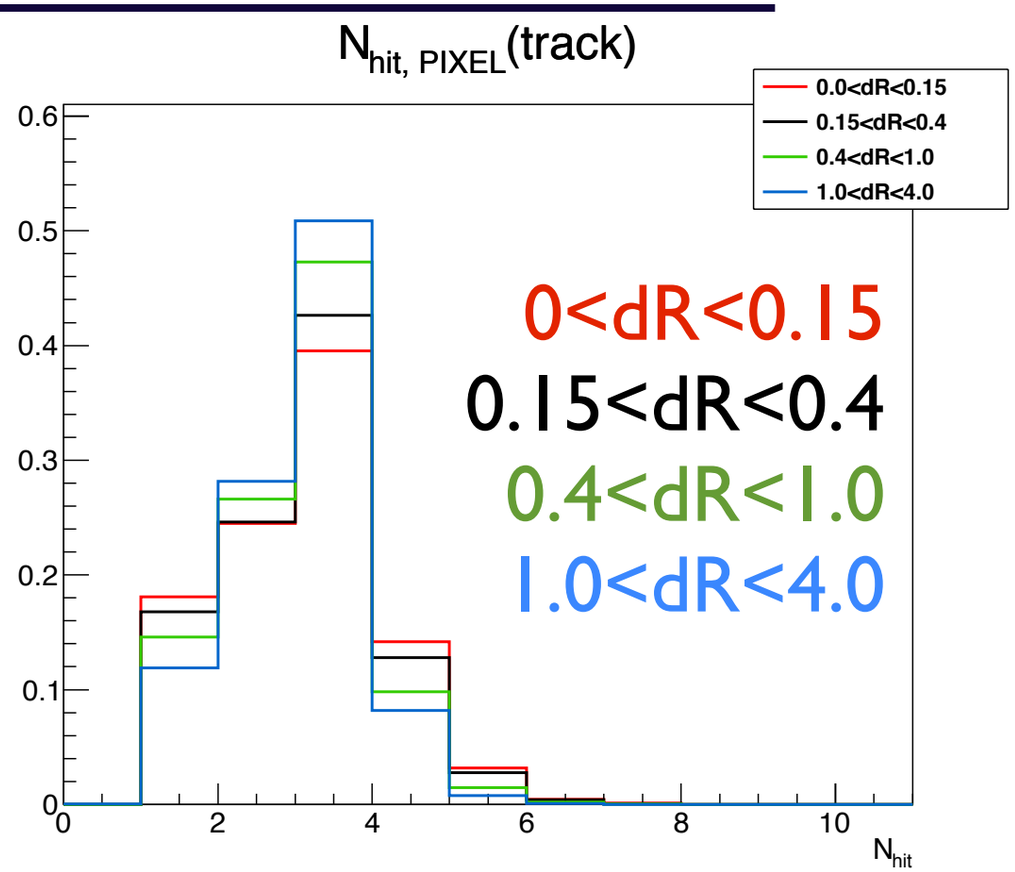


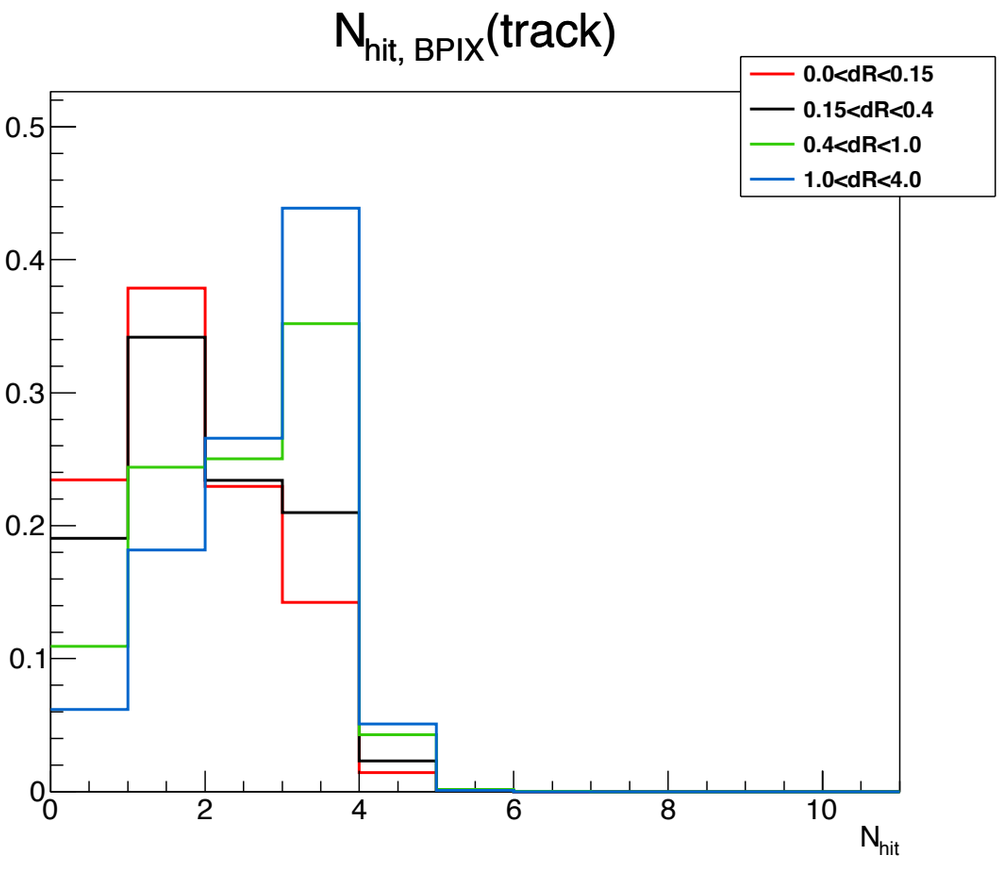
More isolated tracks are selected.

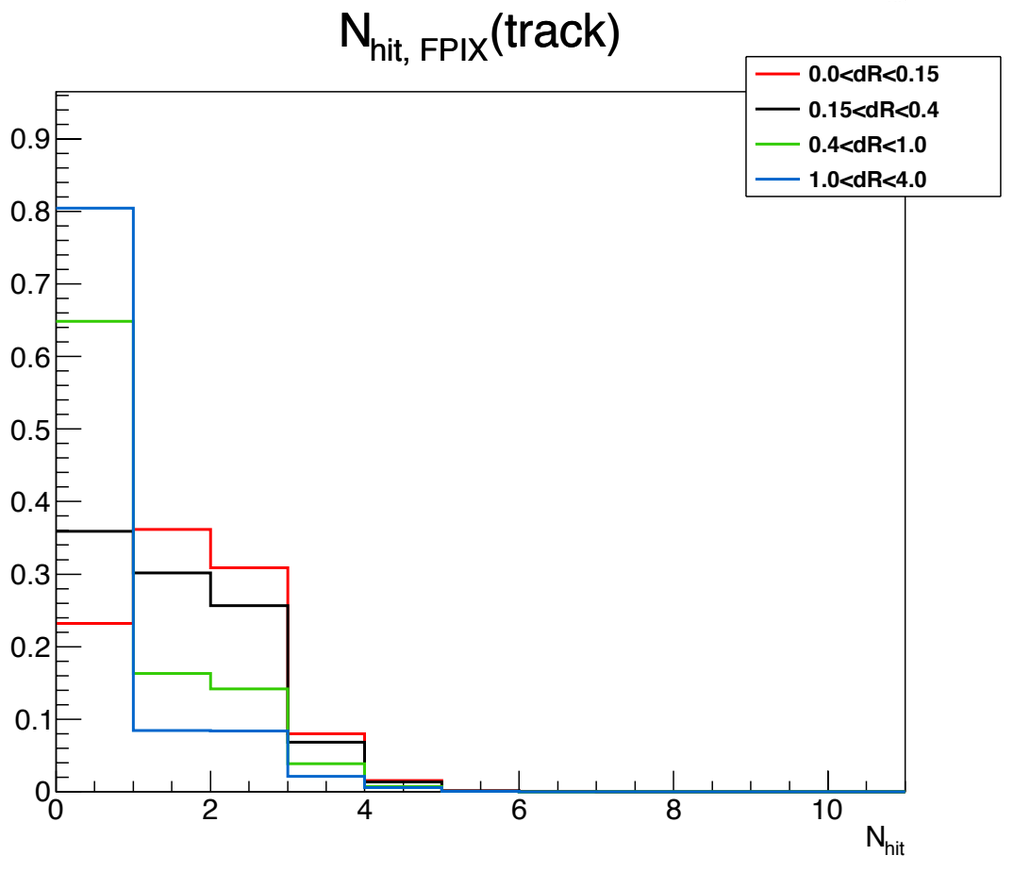
goodVtx

Track distributions: Pixel hits

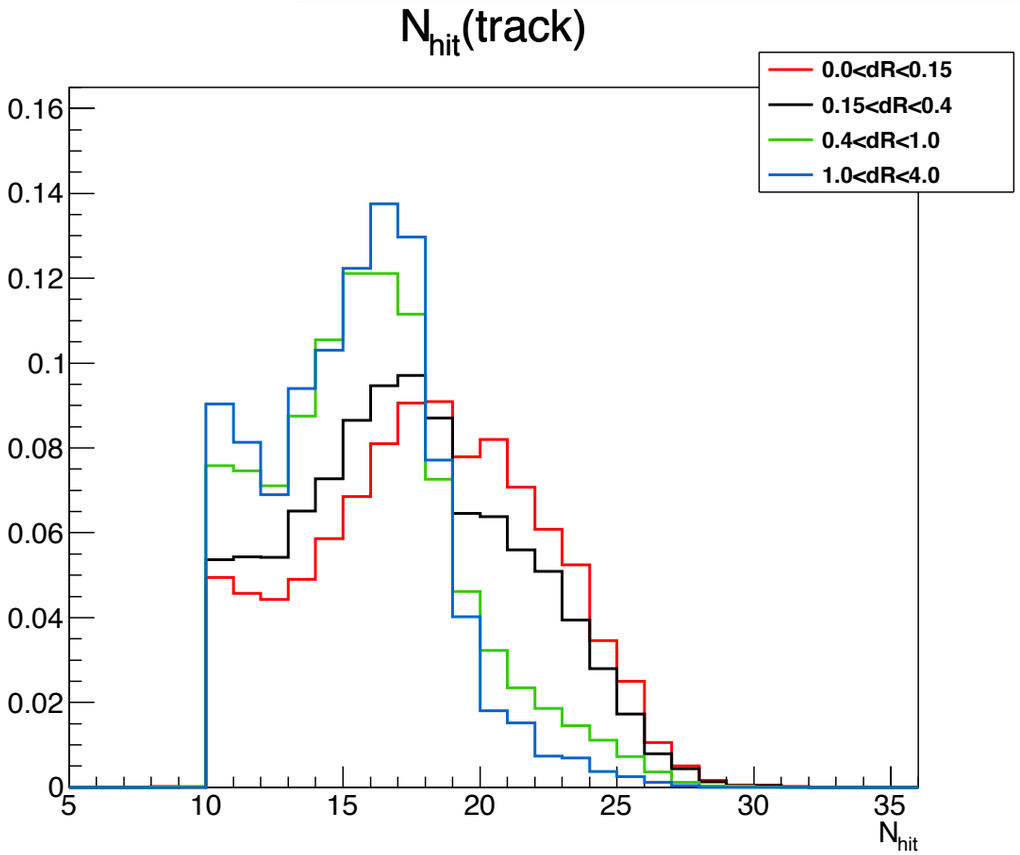


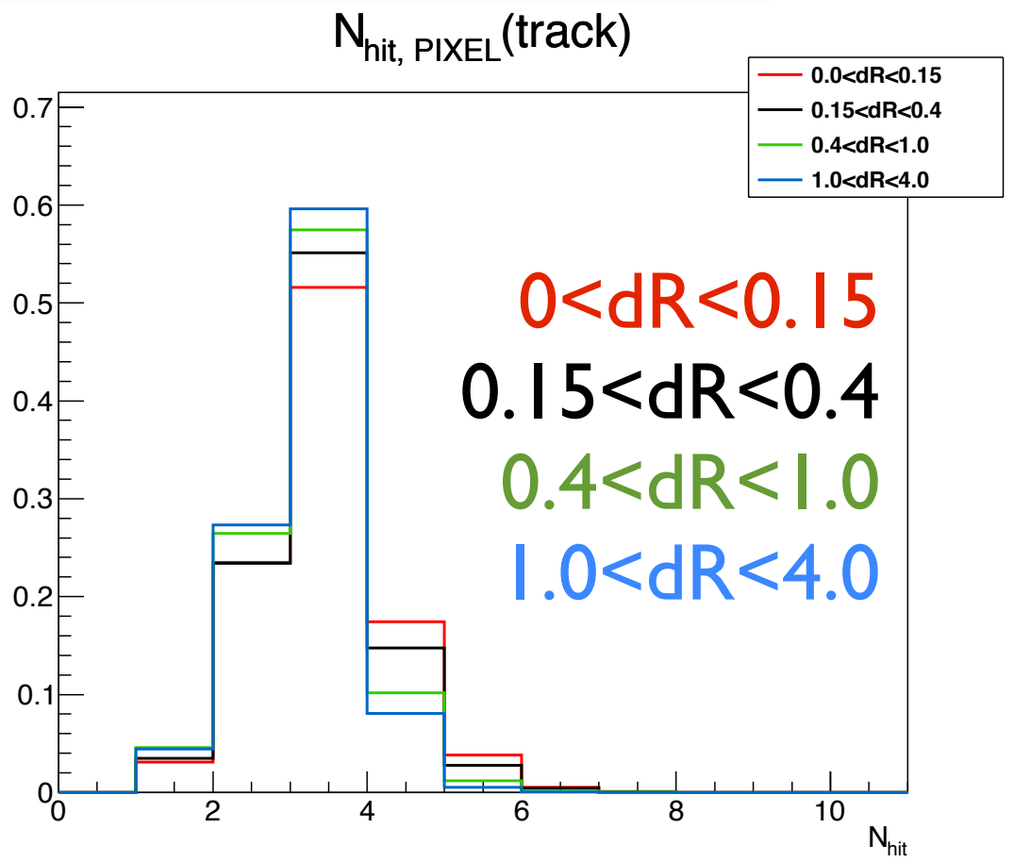


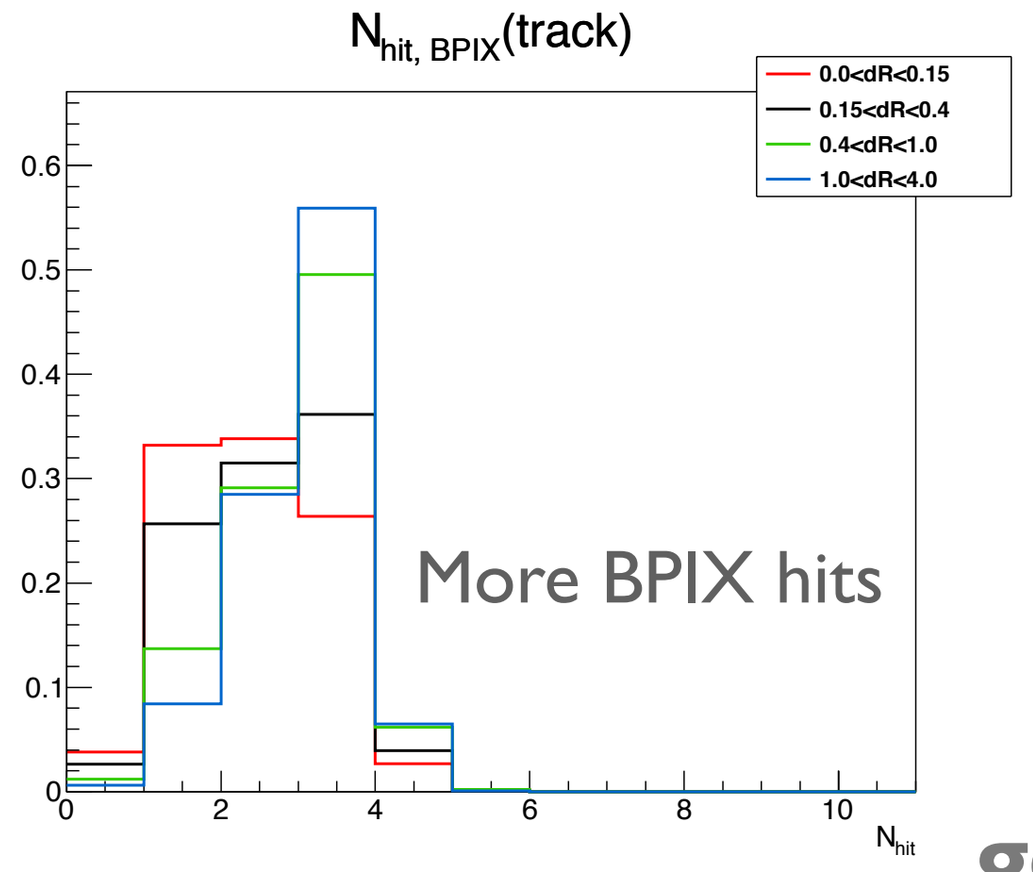


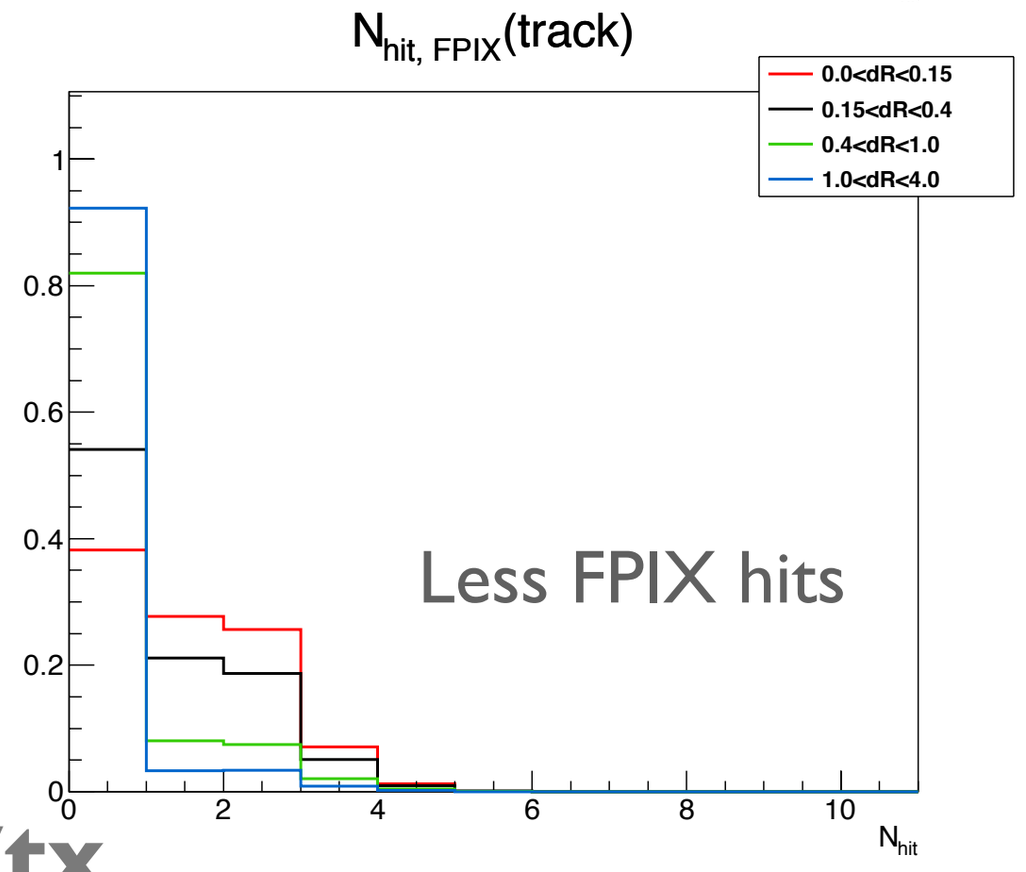


Track distributions: Pixel hits



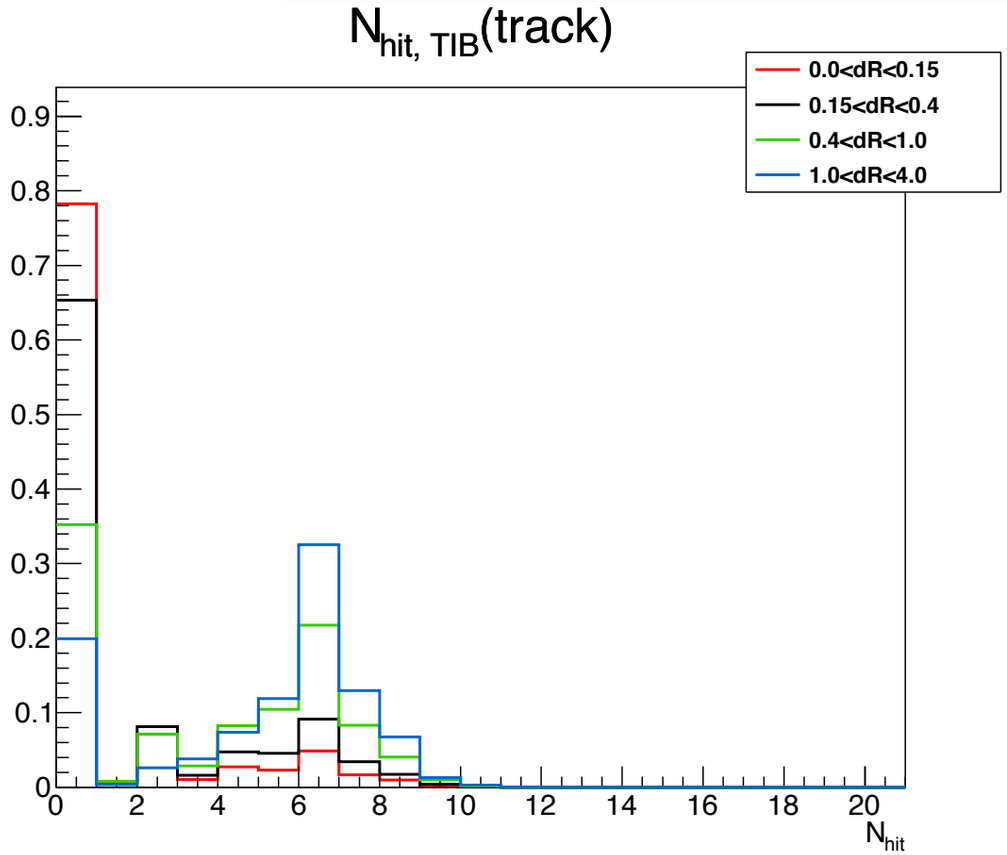


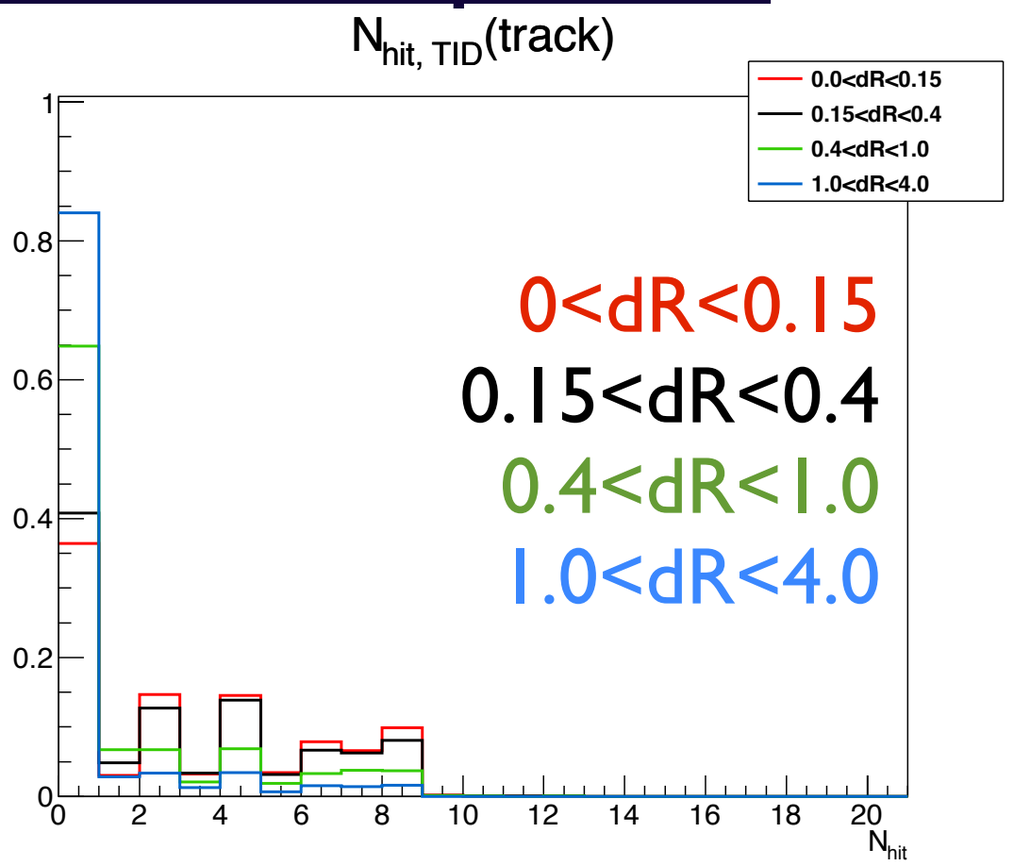




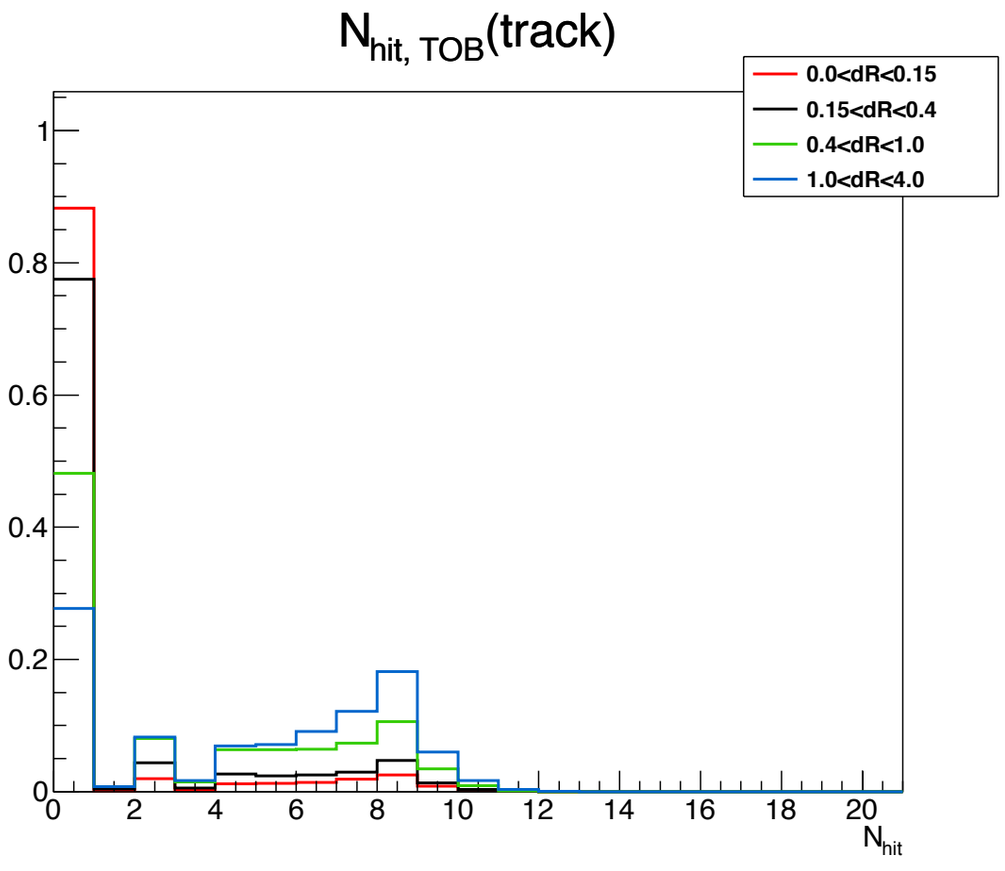
goodVtx

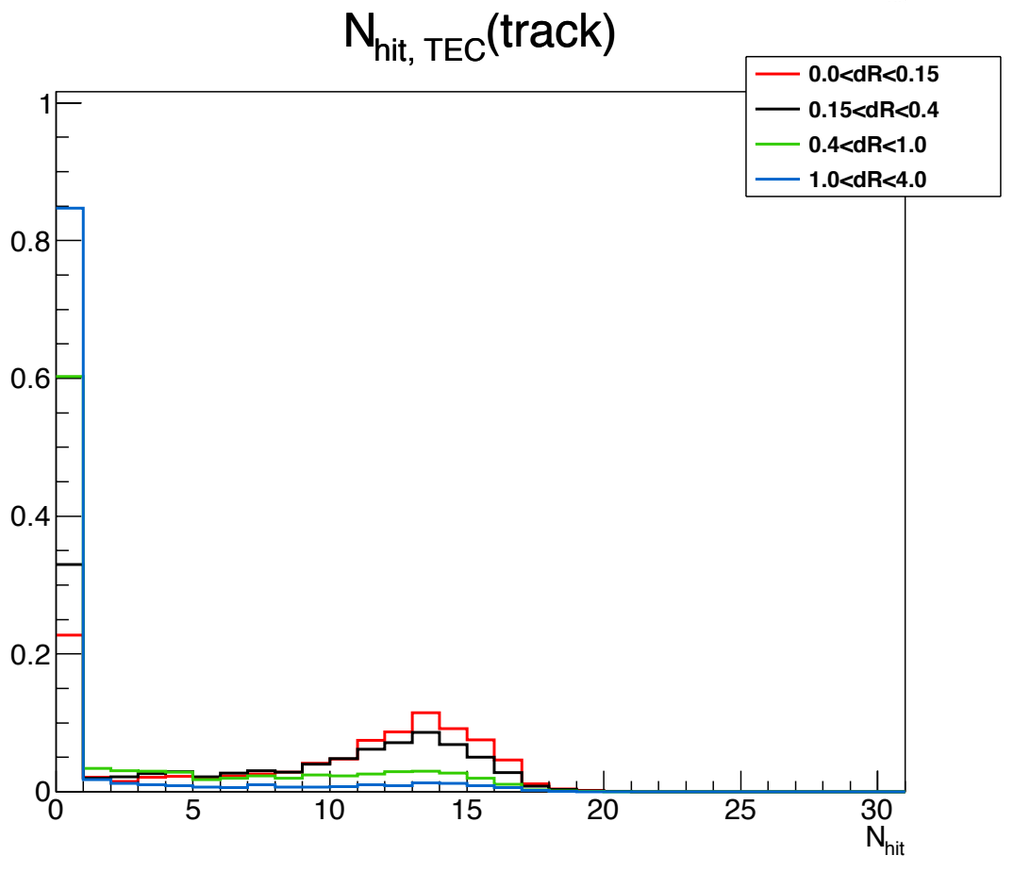
Track distributions: Strip hits



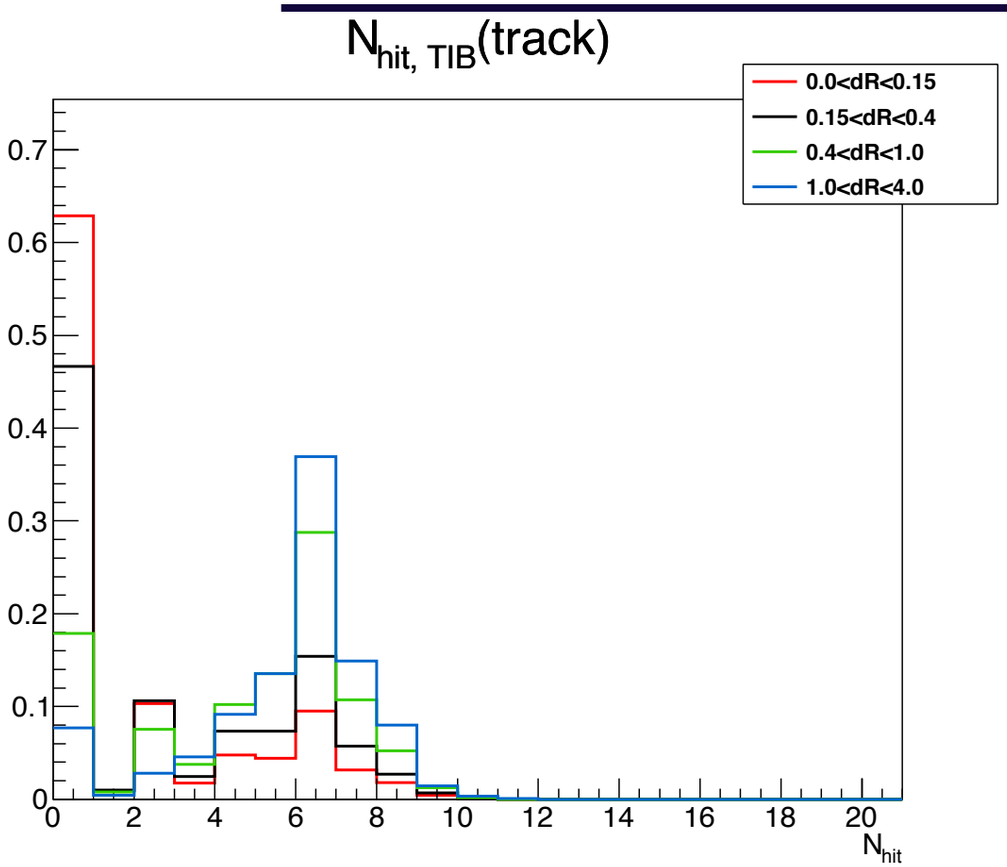


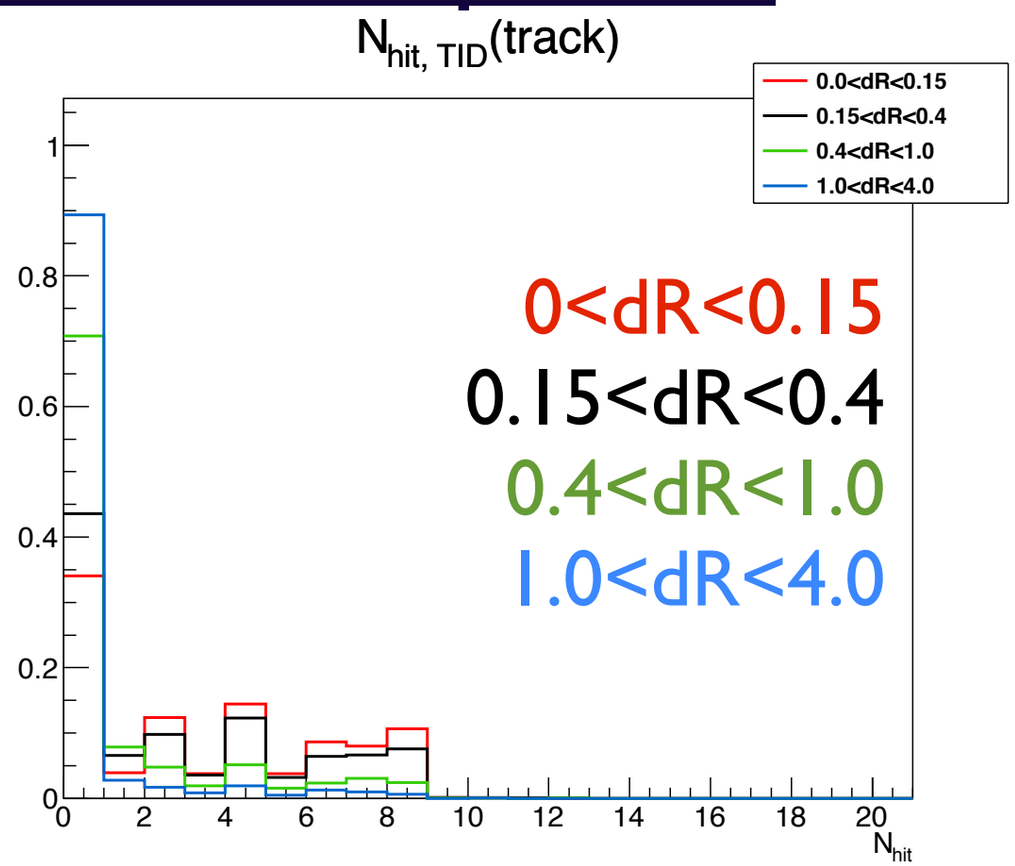
0<dR<0.15
0.15<dR<0.4
0.4<dR<1.0
1.0<dR<4.0





Track distributions: Strip hits



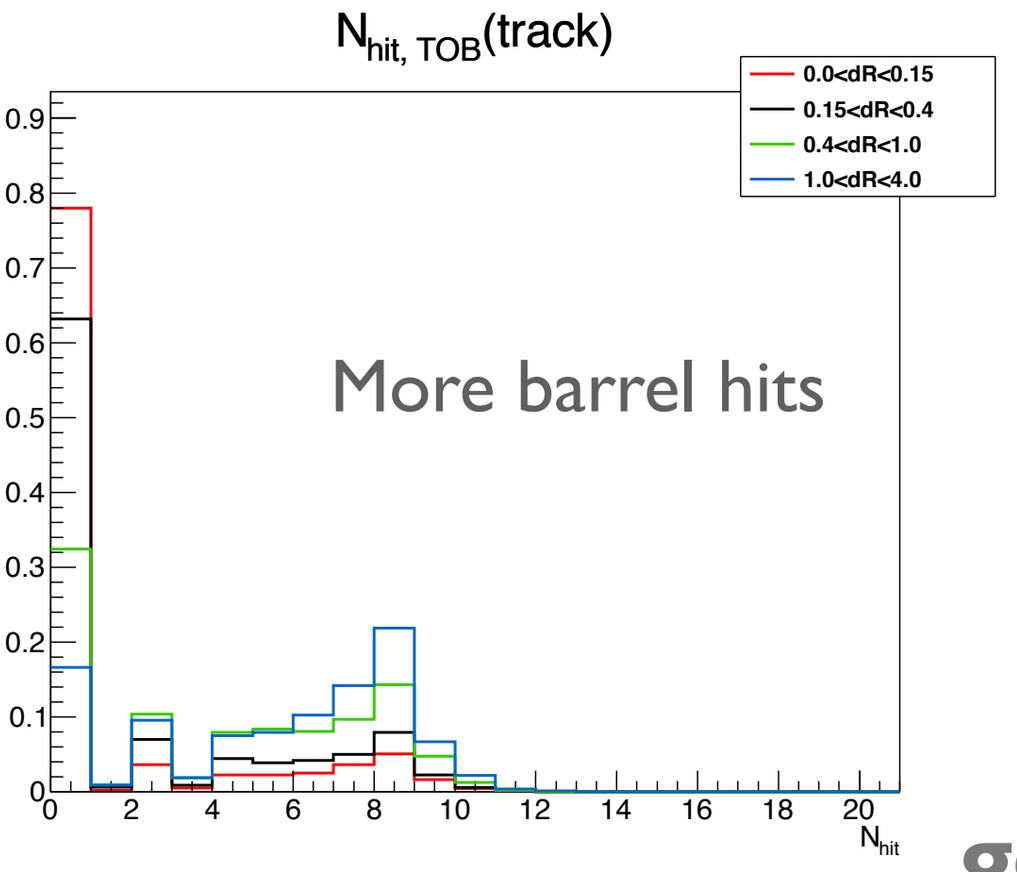


0<dR<0.15

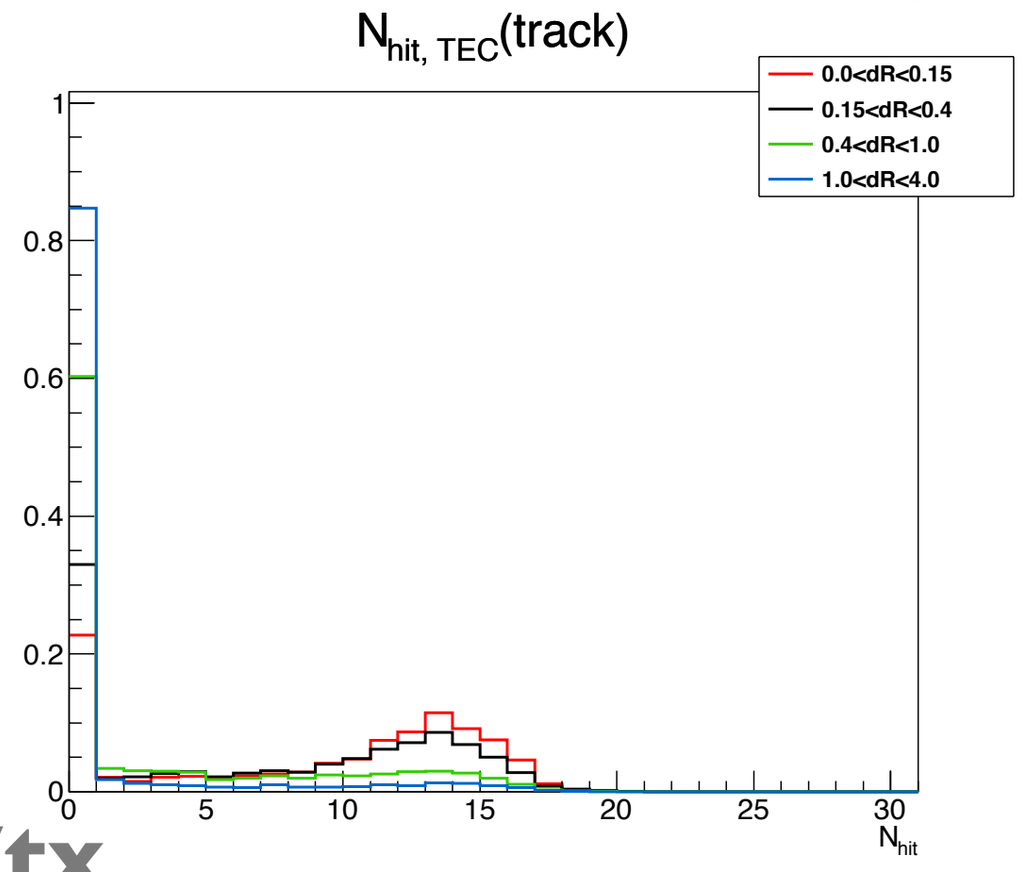
0.15<dR<0.4

0.4<dR<1.0

1.0<dR<4.0

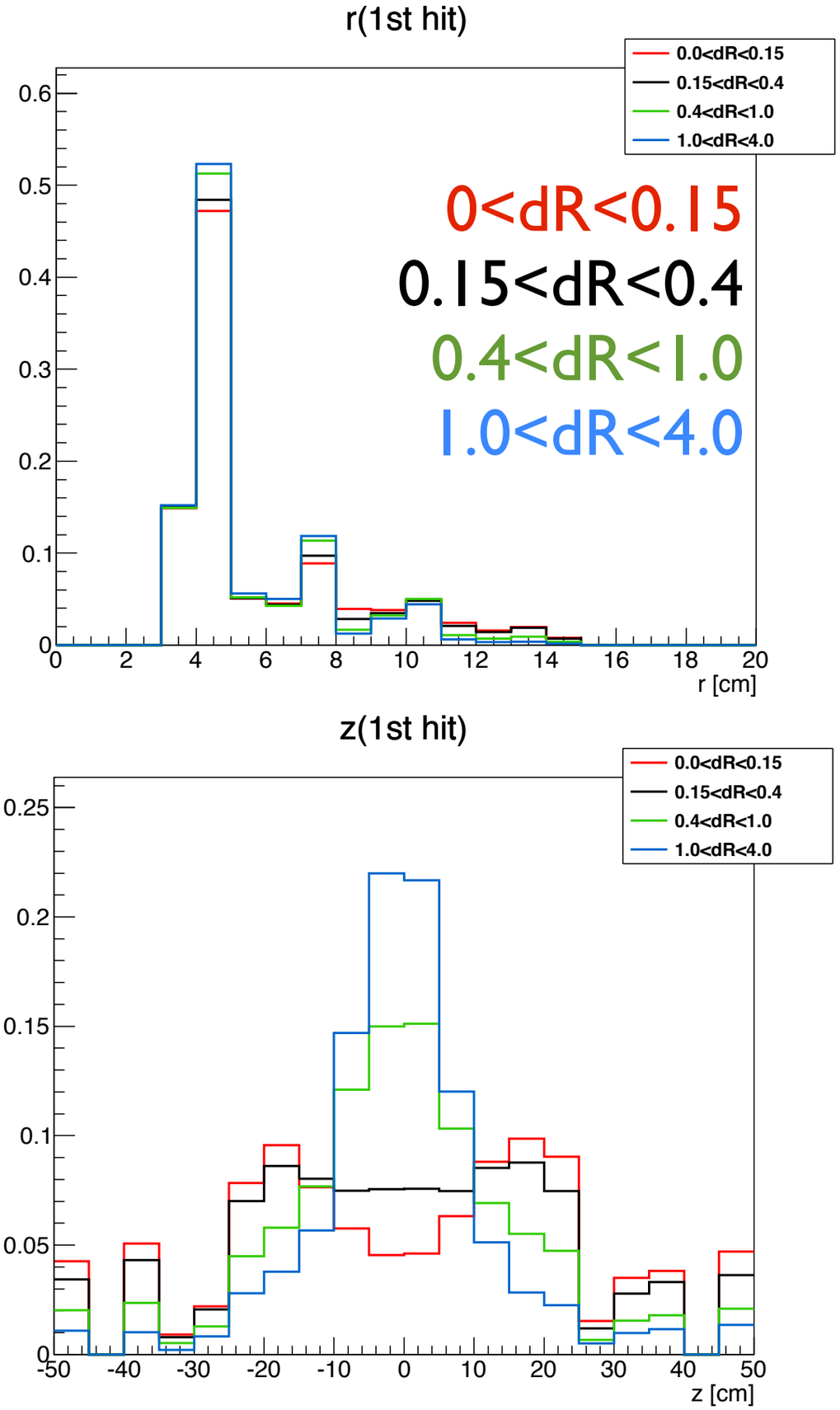


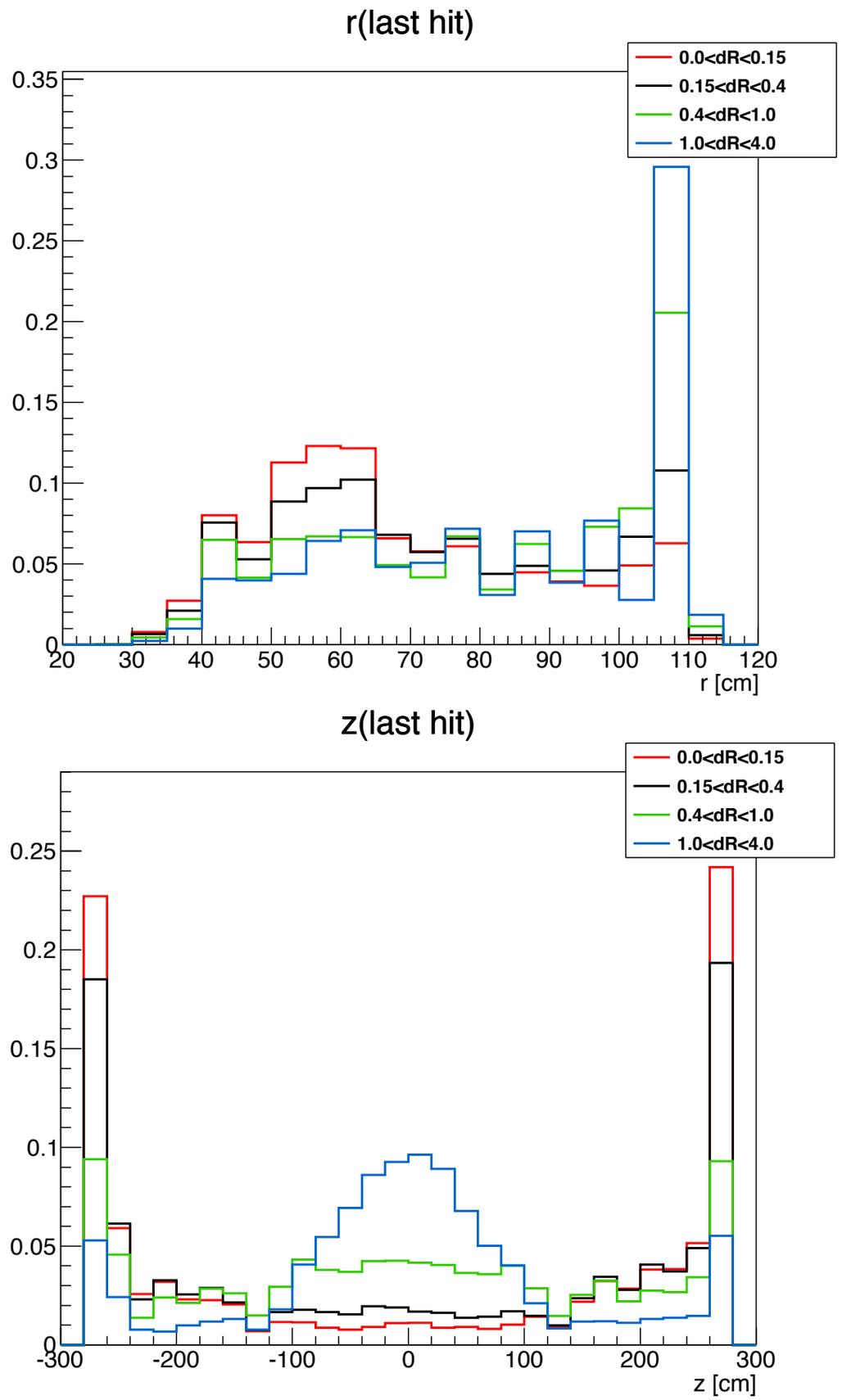
More barrel hits



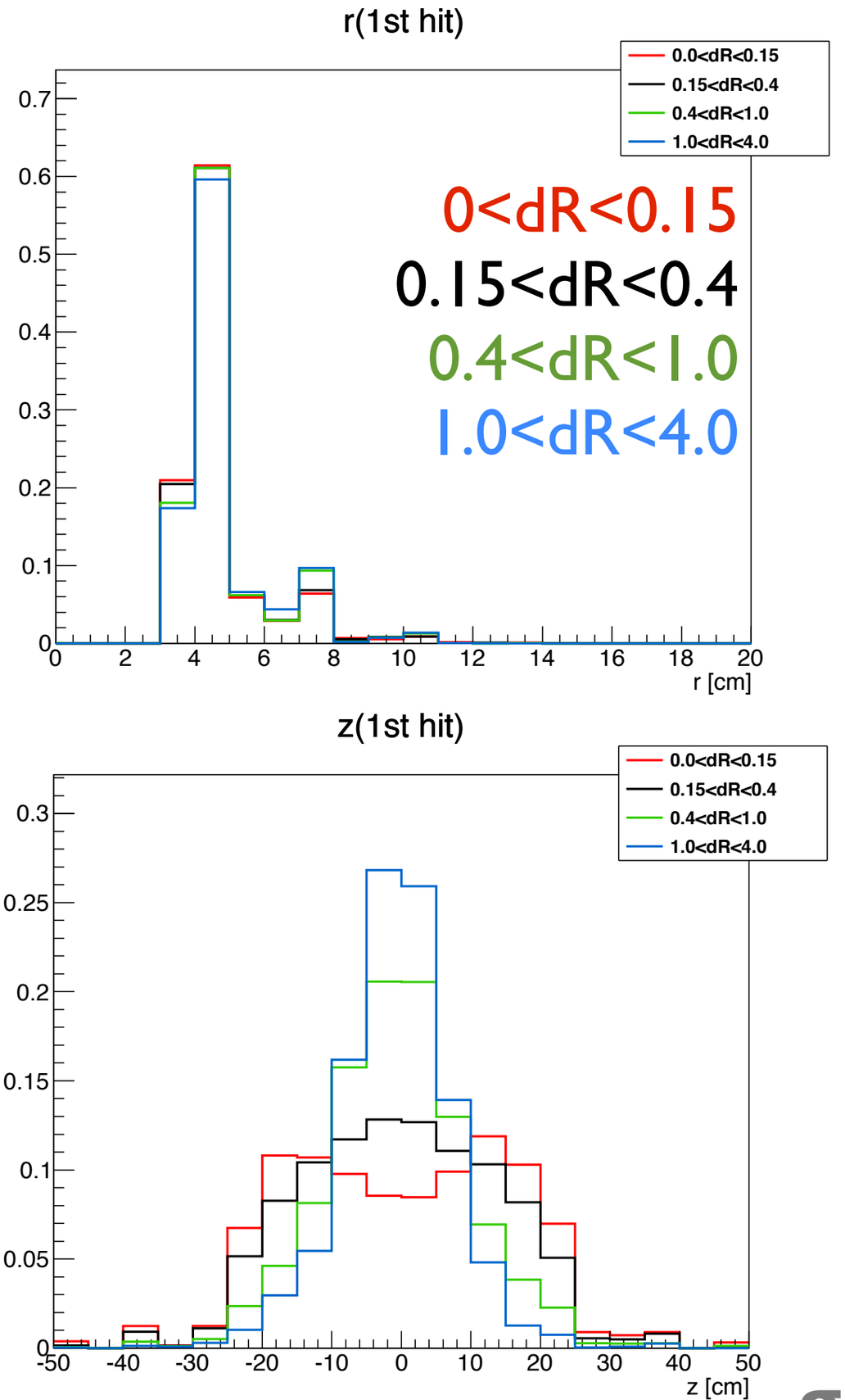
goodVtx

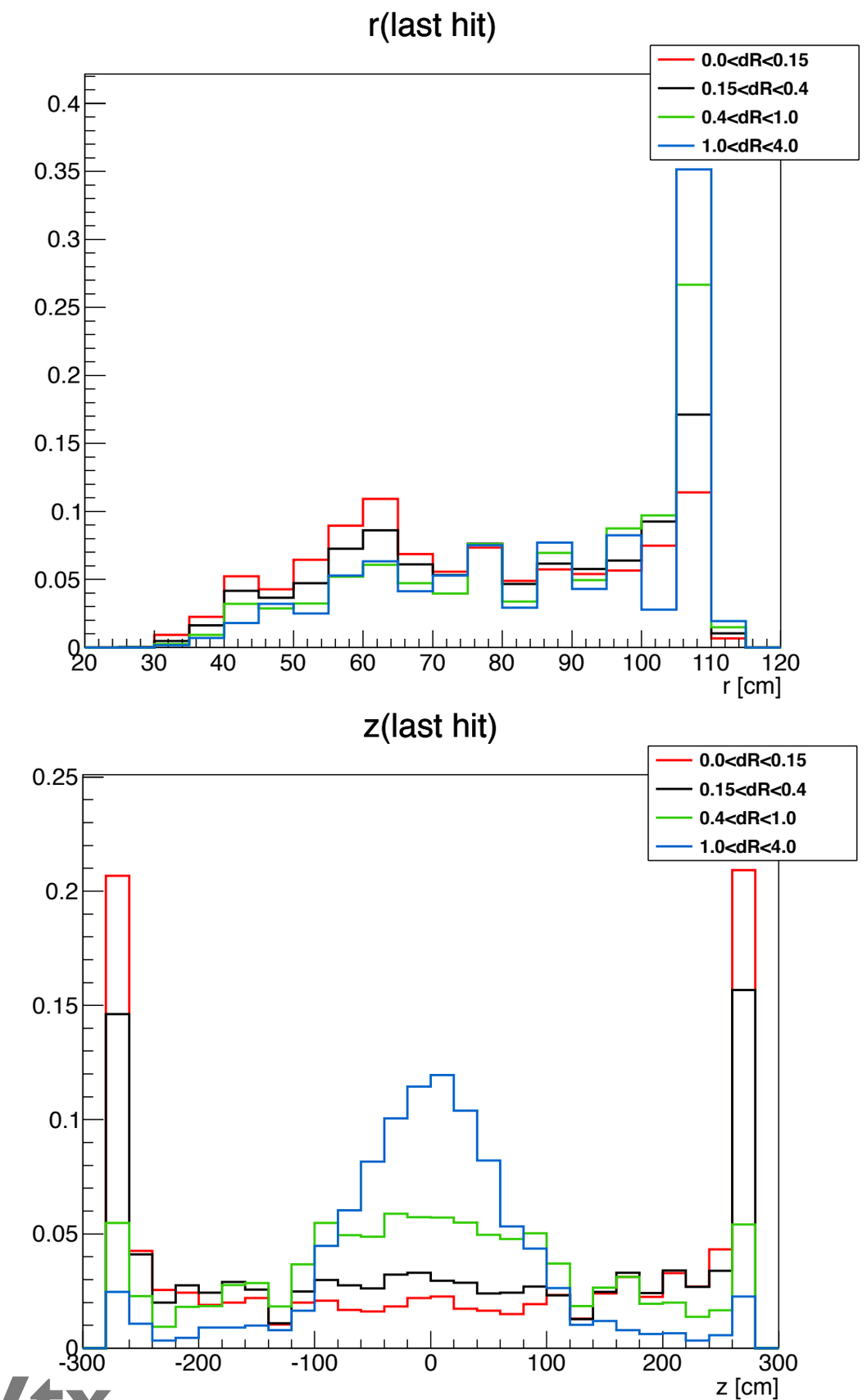
Track distributions: Border hits





Track distributions: Border hits





0<dR<0.15

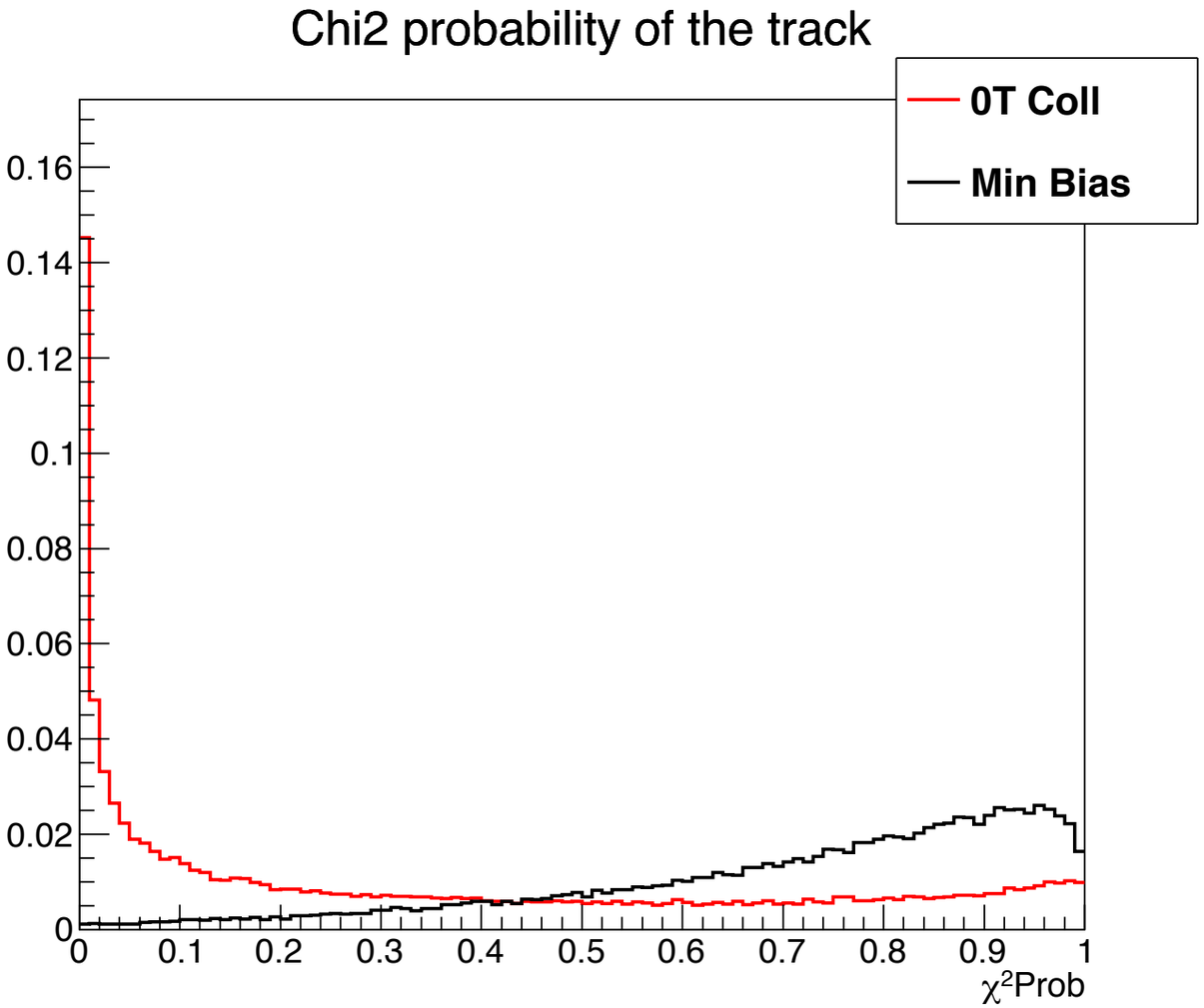
0.15<dR<0.4

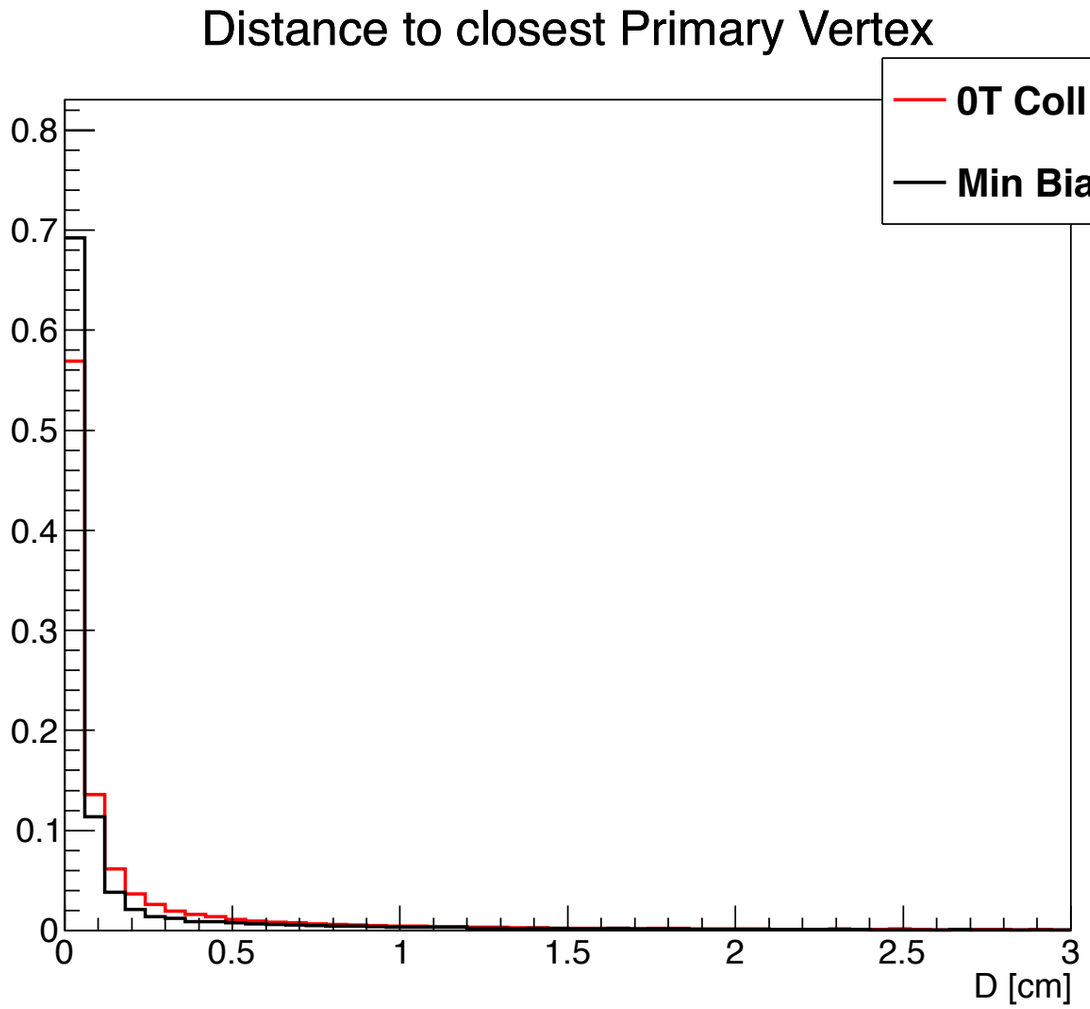
0.4<dR<1.0

1.0<dR<4.0

goodVtx

Track quality improvement





Tracks from 1-st bin of Chi2Prob distribution, and track not in 1-st bin of PV distance can be rejected.

Track selection

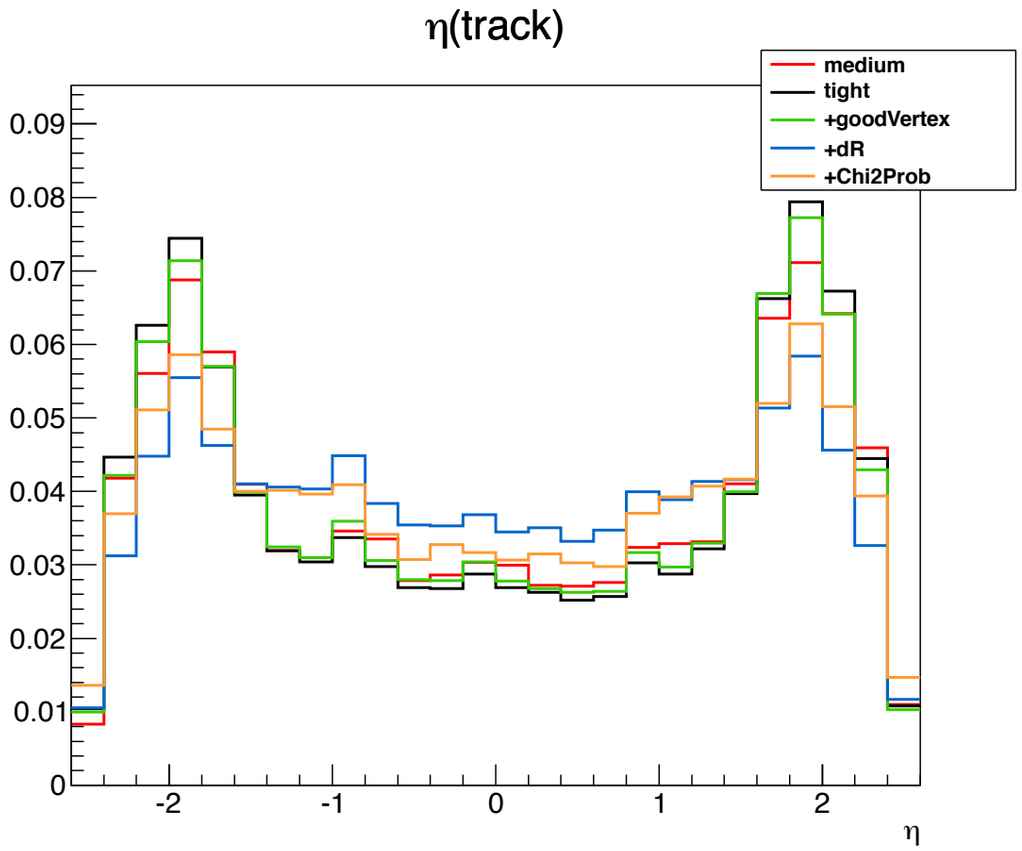
Tracks (Medium)
|dXY| ≤ 50 cm
|dZ| ≤ 18 cm
N hits ≥ 10
N pixel hits ≥1
N 2D hits ≥ 2
PV dist ≤ 0.06 cm

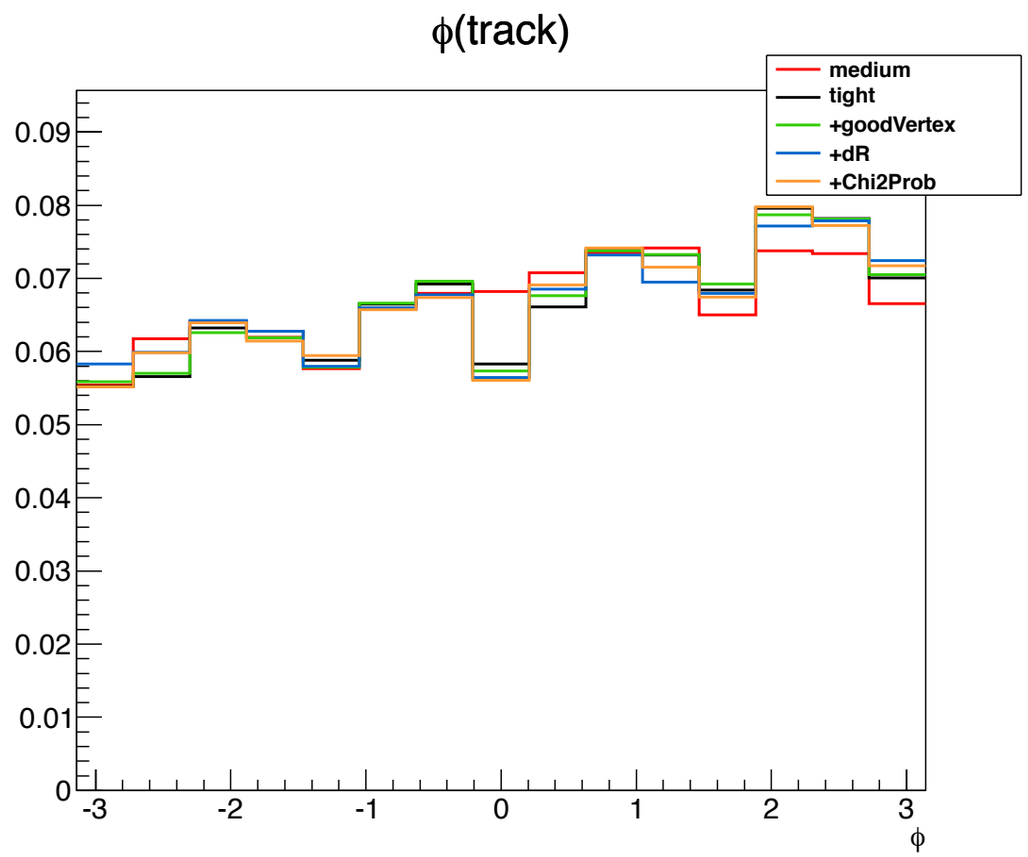
Tracks (Tight)
|dXY| ≤ 7 cm
|dZ| ≤ 18 cm
N hits ≥ 10
N pixel hits ≥2
N 2D hits ≥ 3
PV dist ≤ 0.06 cm

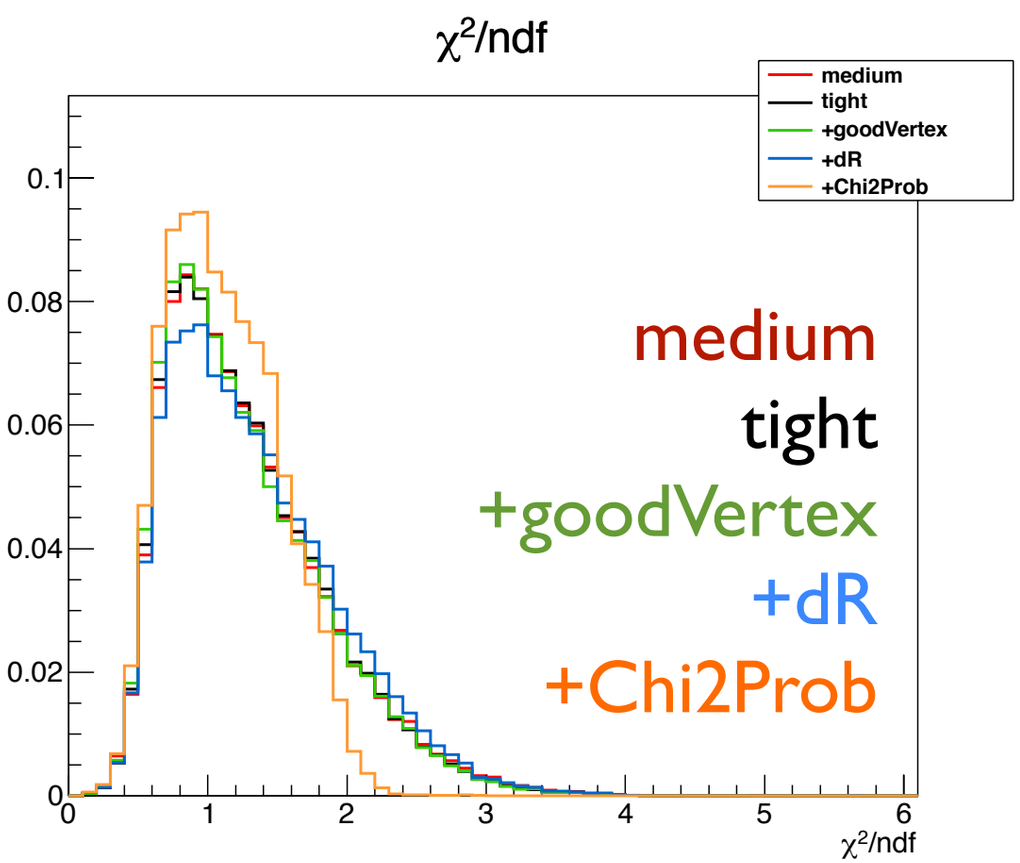
goodVertices
|dXY| ≤ 0.2 cm
|dZ| ≤ 24 cm
NDoF ≥ 4

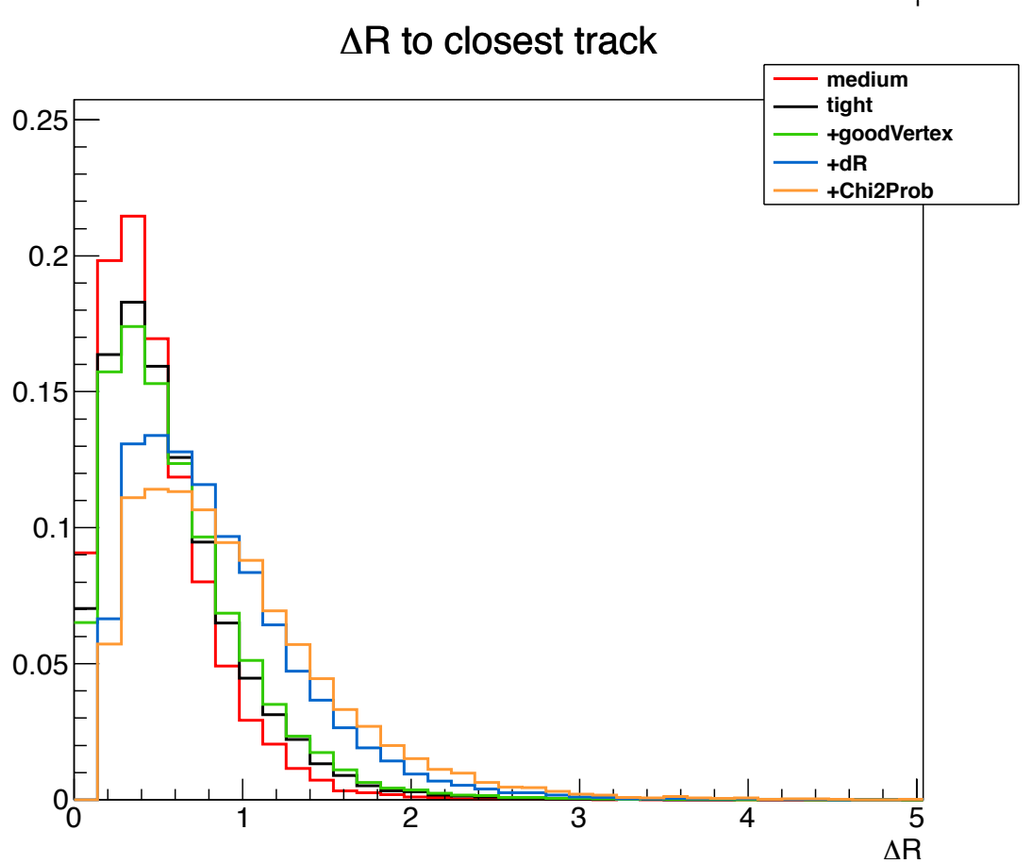
1. Tracks(Medium)
2. Tracks(Tight)
3. –||– + goodVertices
4. –||– + [0.2≤dRmin≤4]
5. –||– + [χ^2Prob ≥ 0.015]

Track distributions: Kinematics

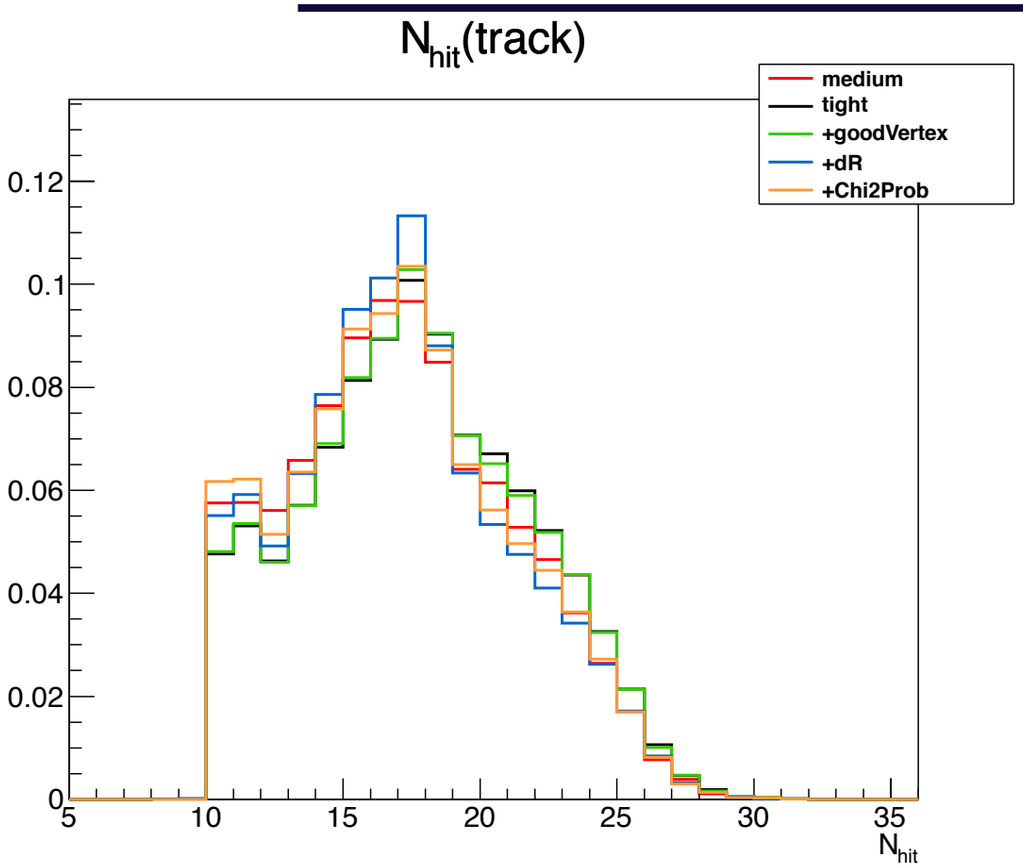


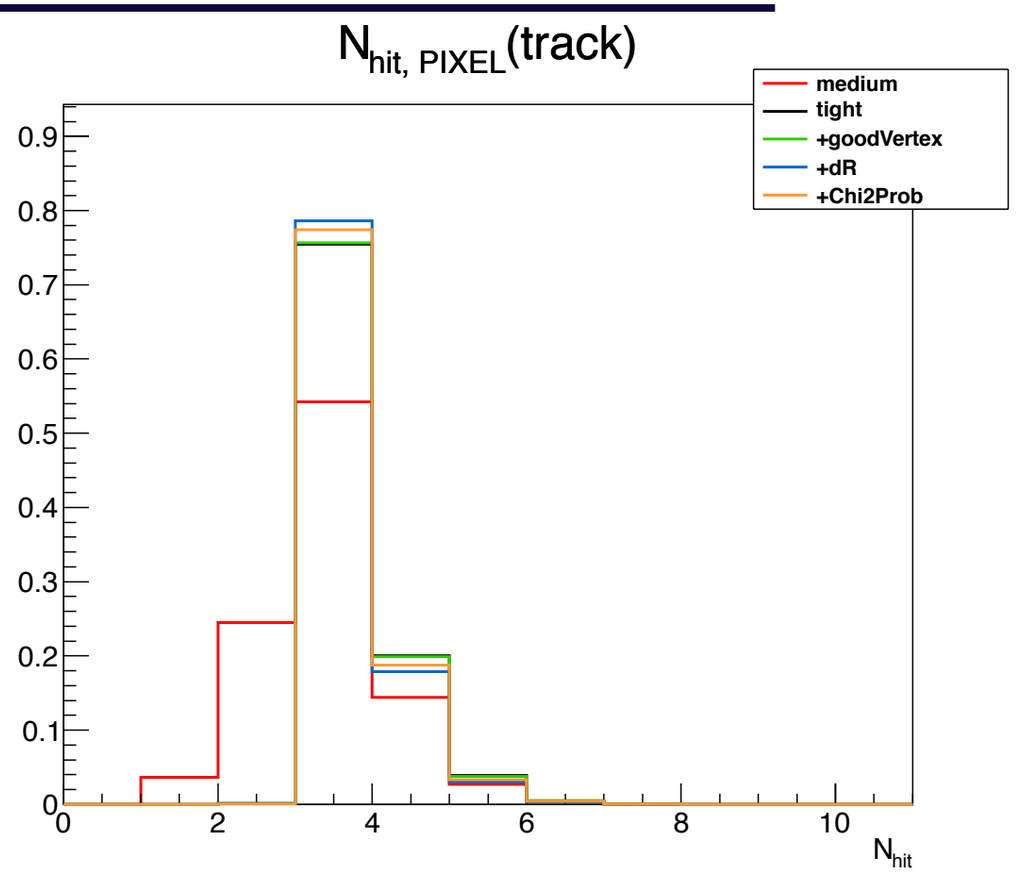


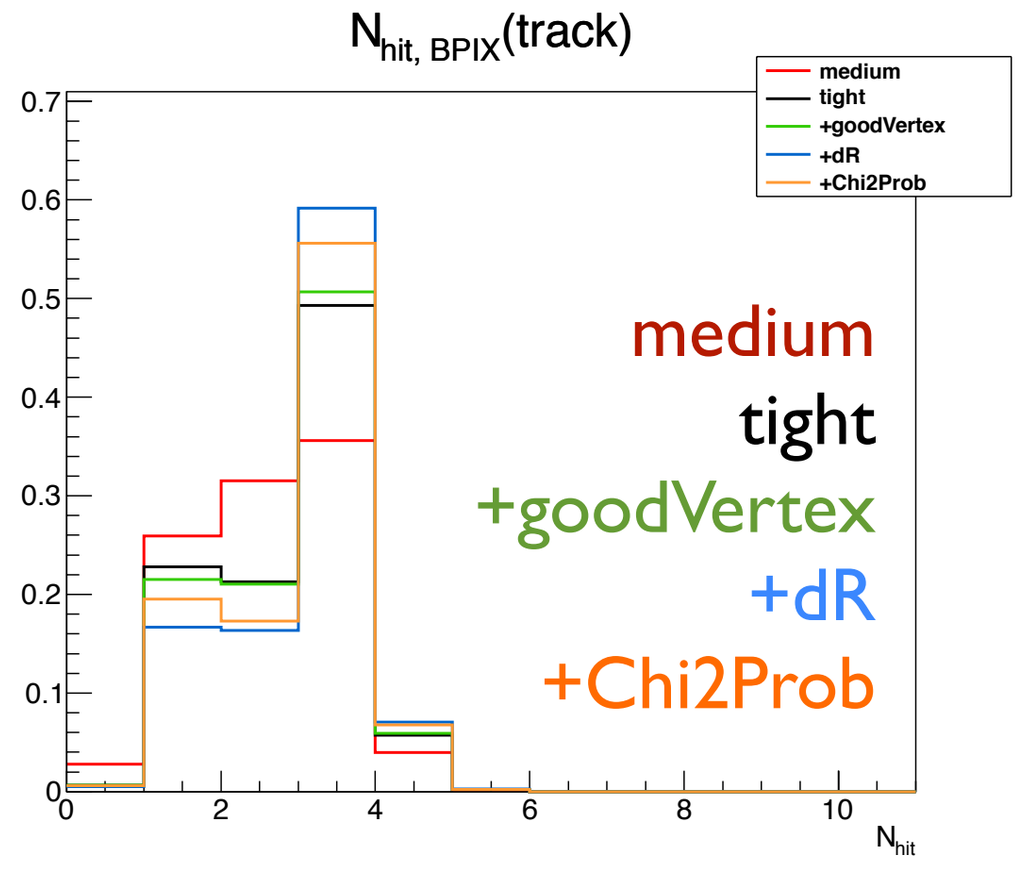


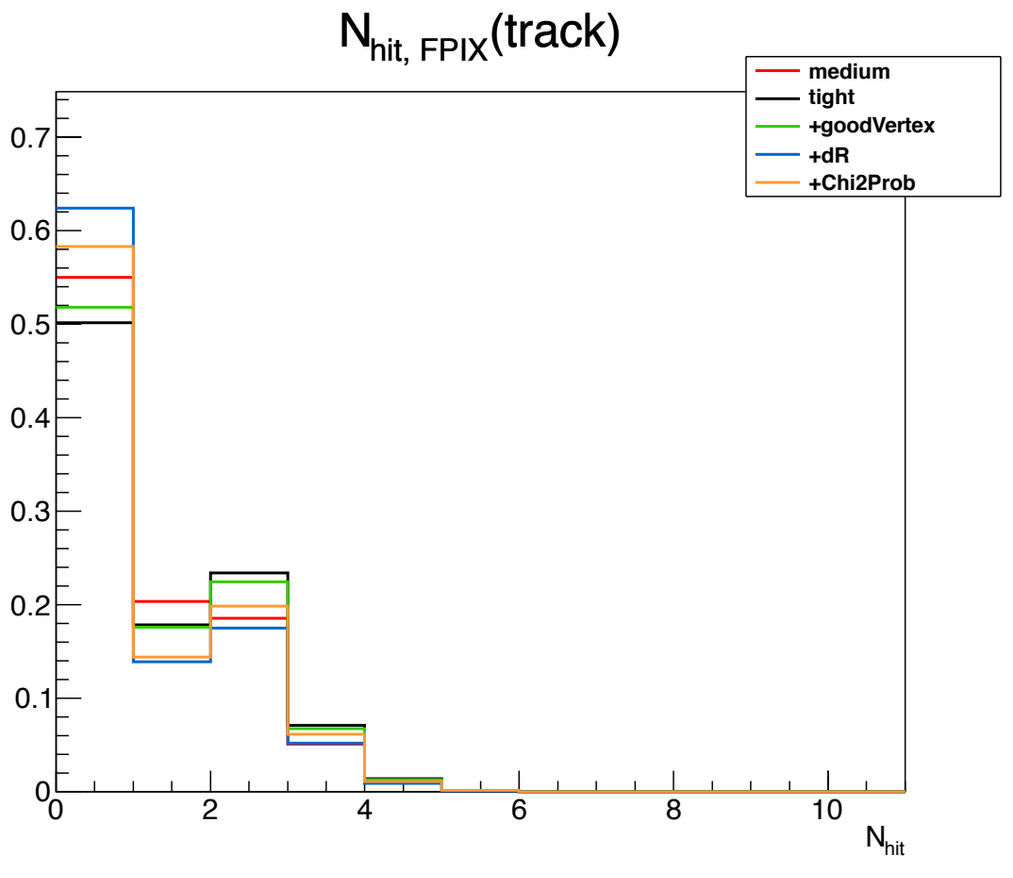


Track distributions: Pixel hits

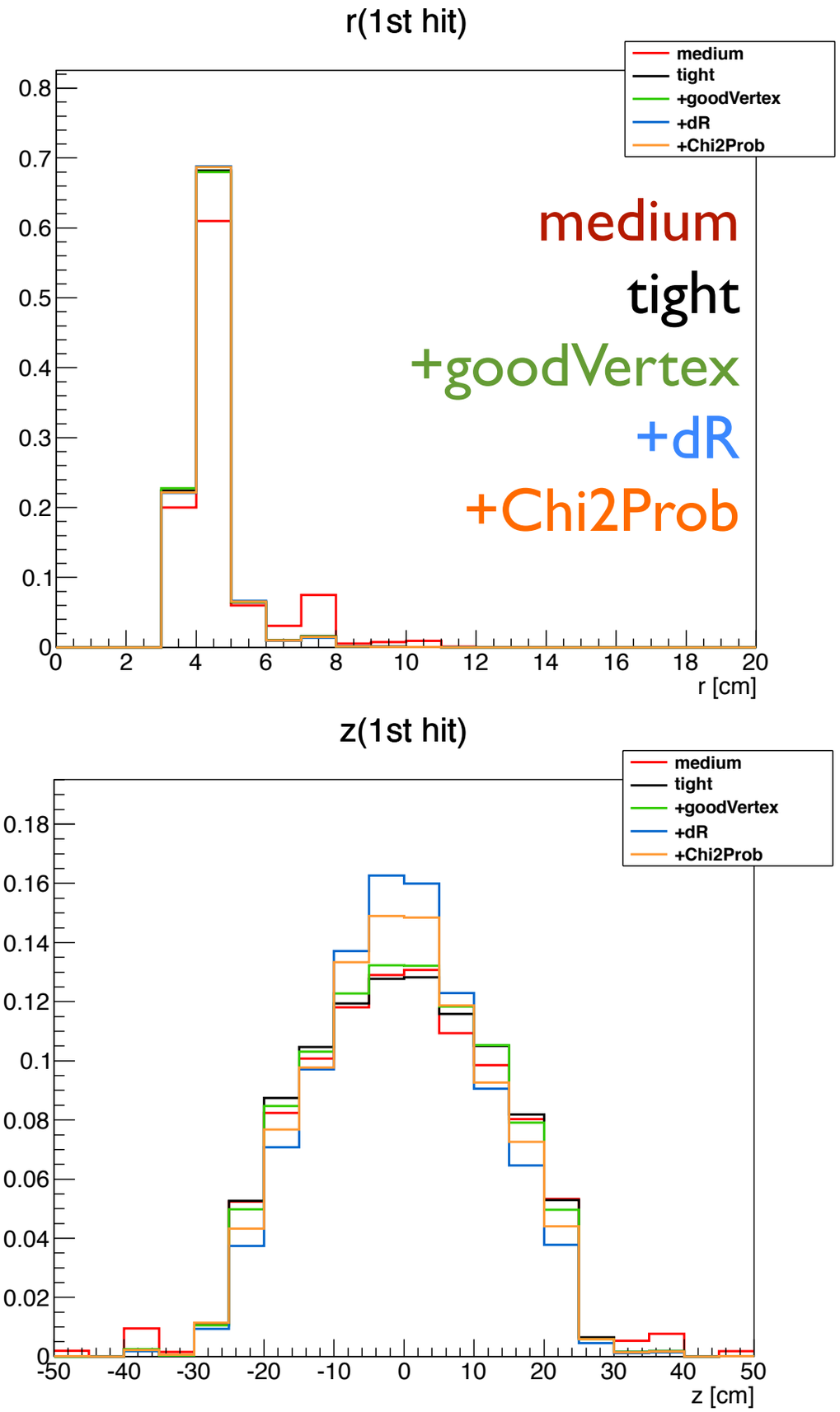


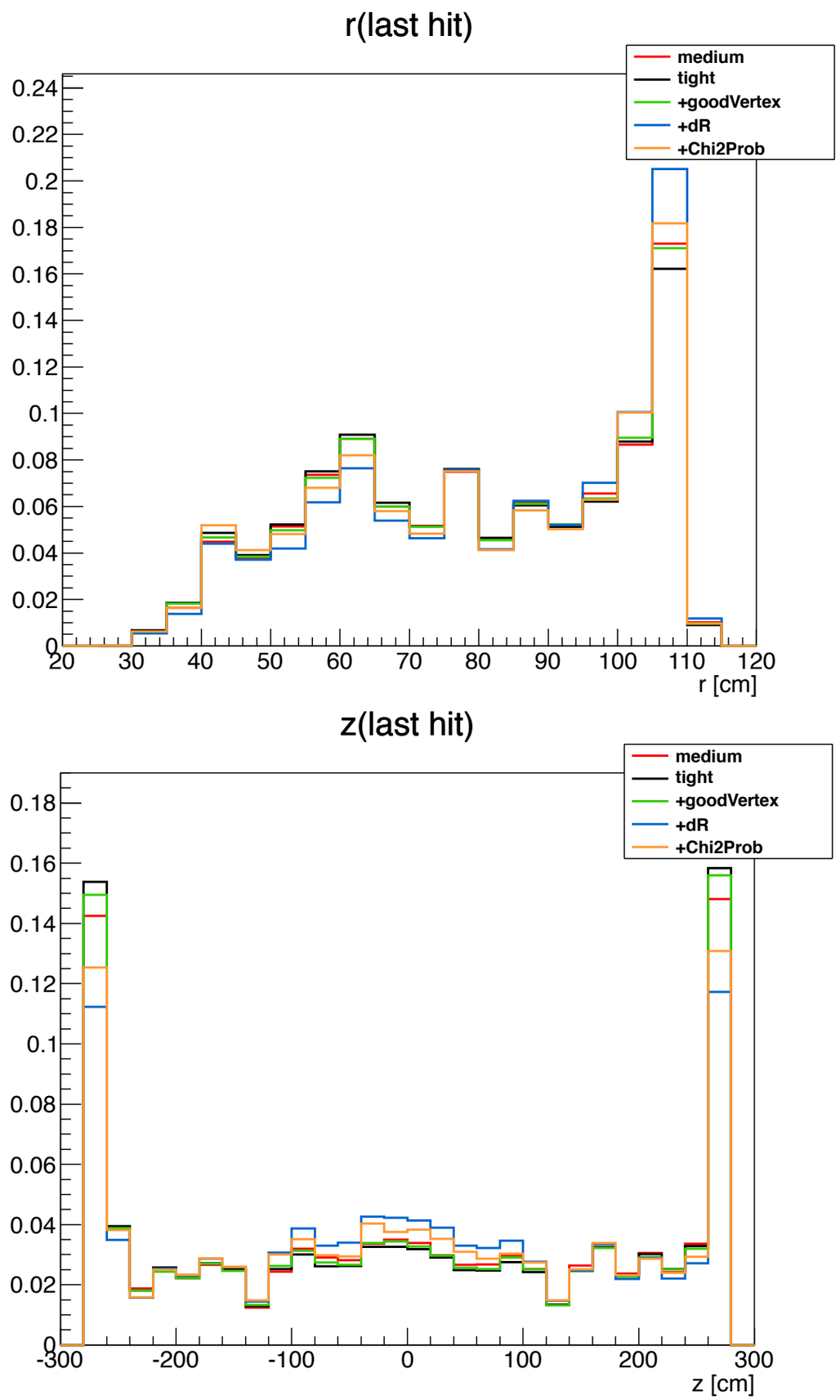






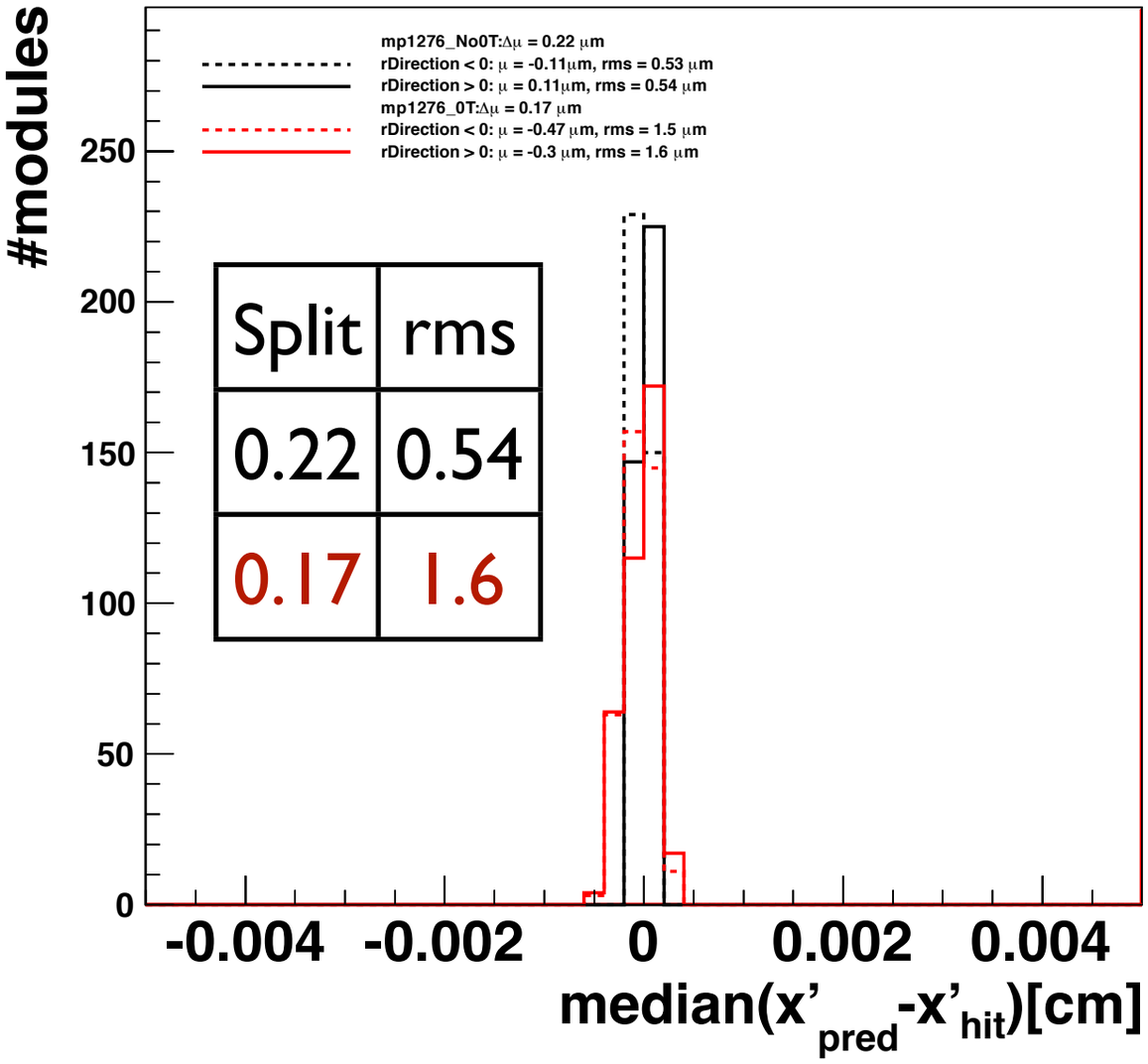
Track distributions: Border hits



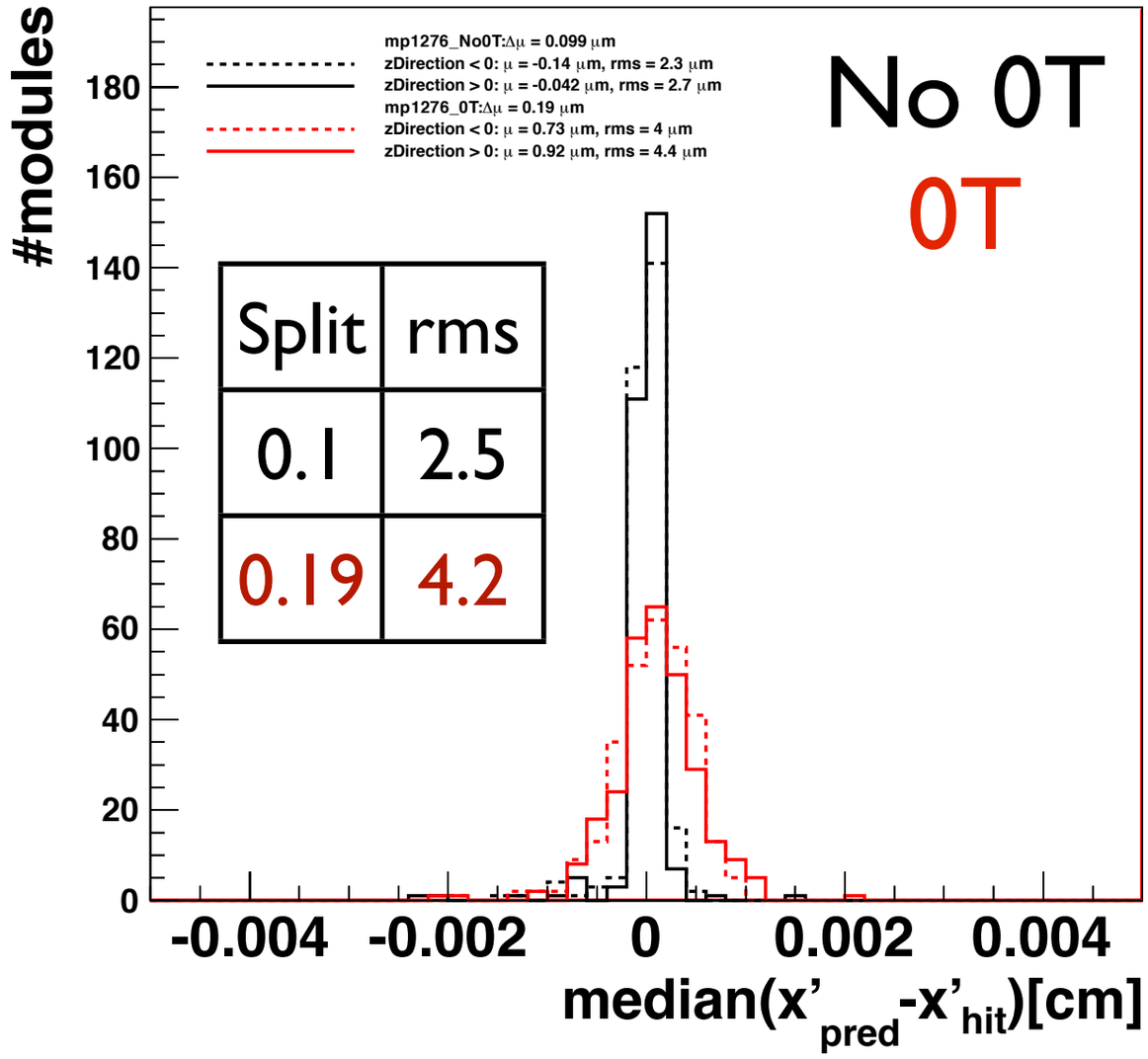


Single Muon validation: 3.8T

Distribution of the median of the residuals in TPB



Distribution of the median of the residuals in TPE

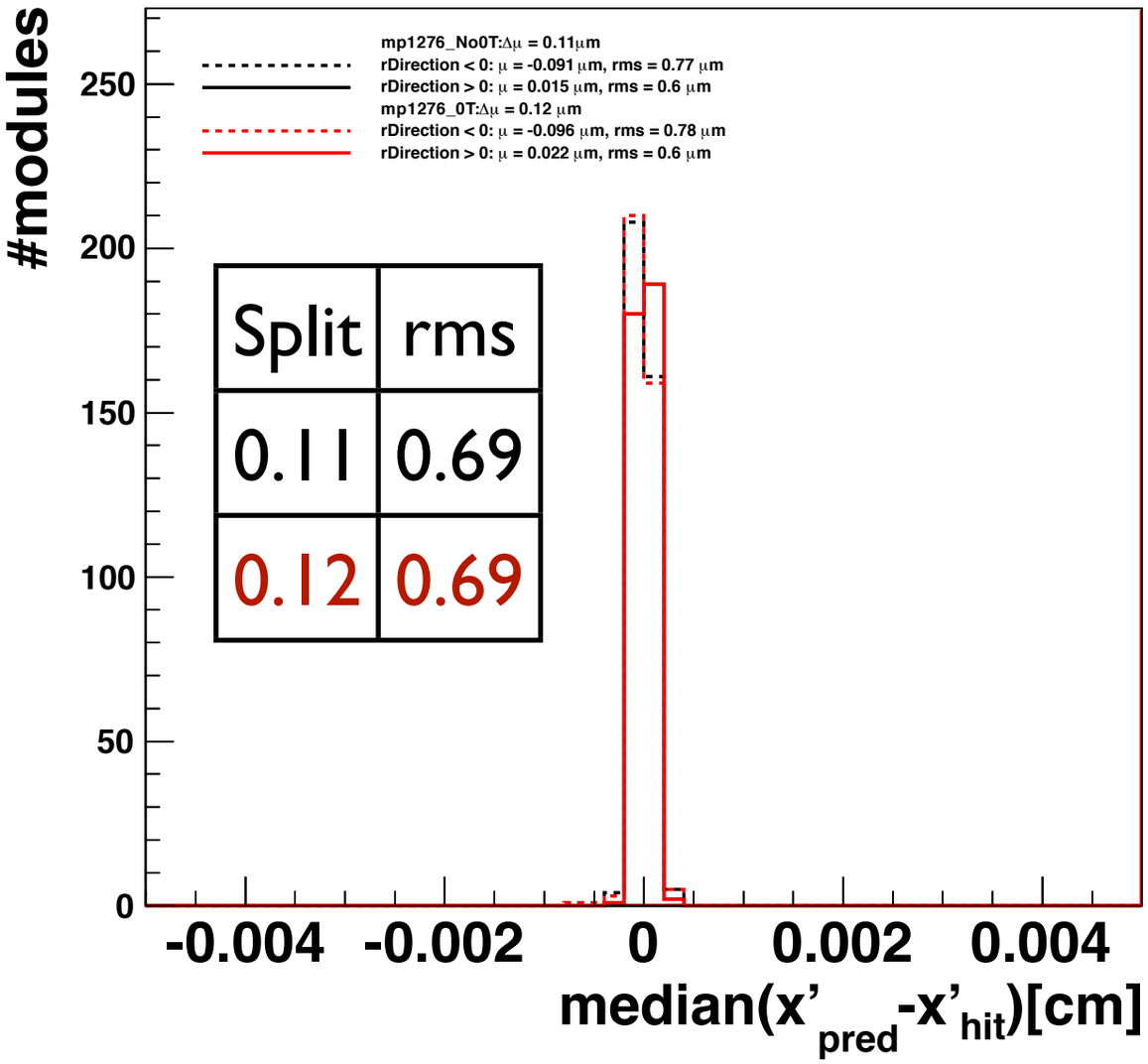


2.3 M tracks : Pt ~37 GeV

2012C used in alignment

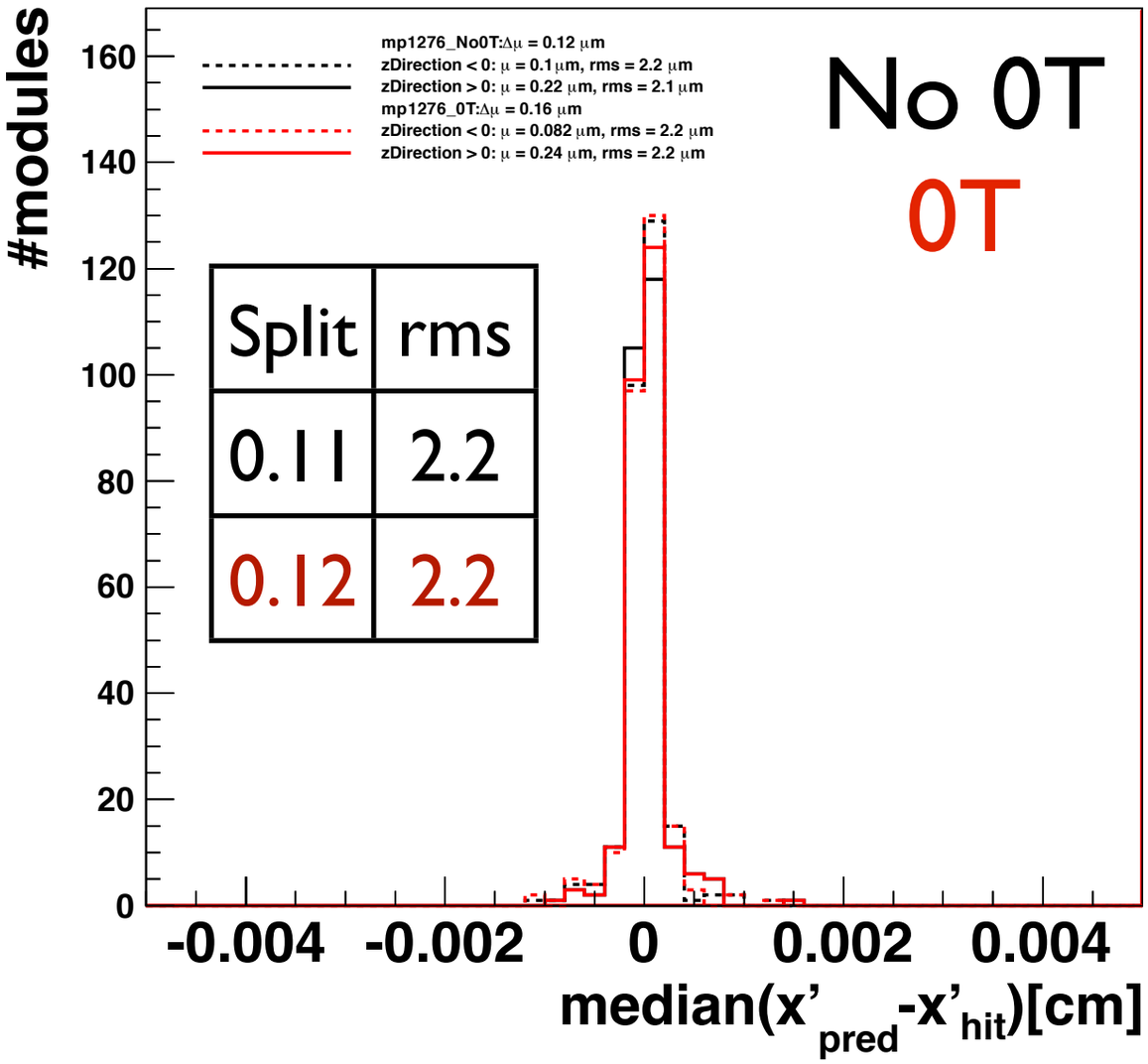
UpsilonToMuMu validation: 3.8T

Distribution of the median of the residuals in TPB



Split	rms
0.11	0.69
0.12	0.69

Distribution of the median of the residuals in TPE



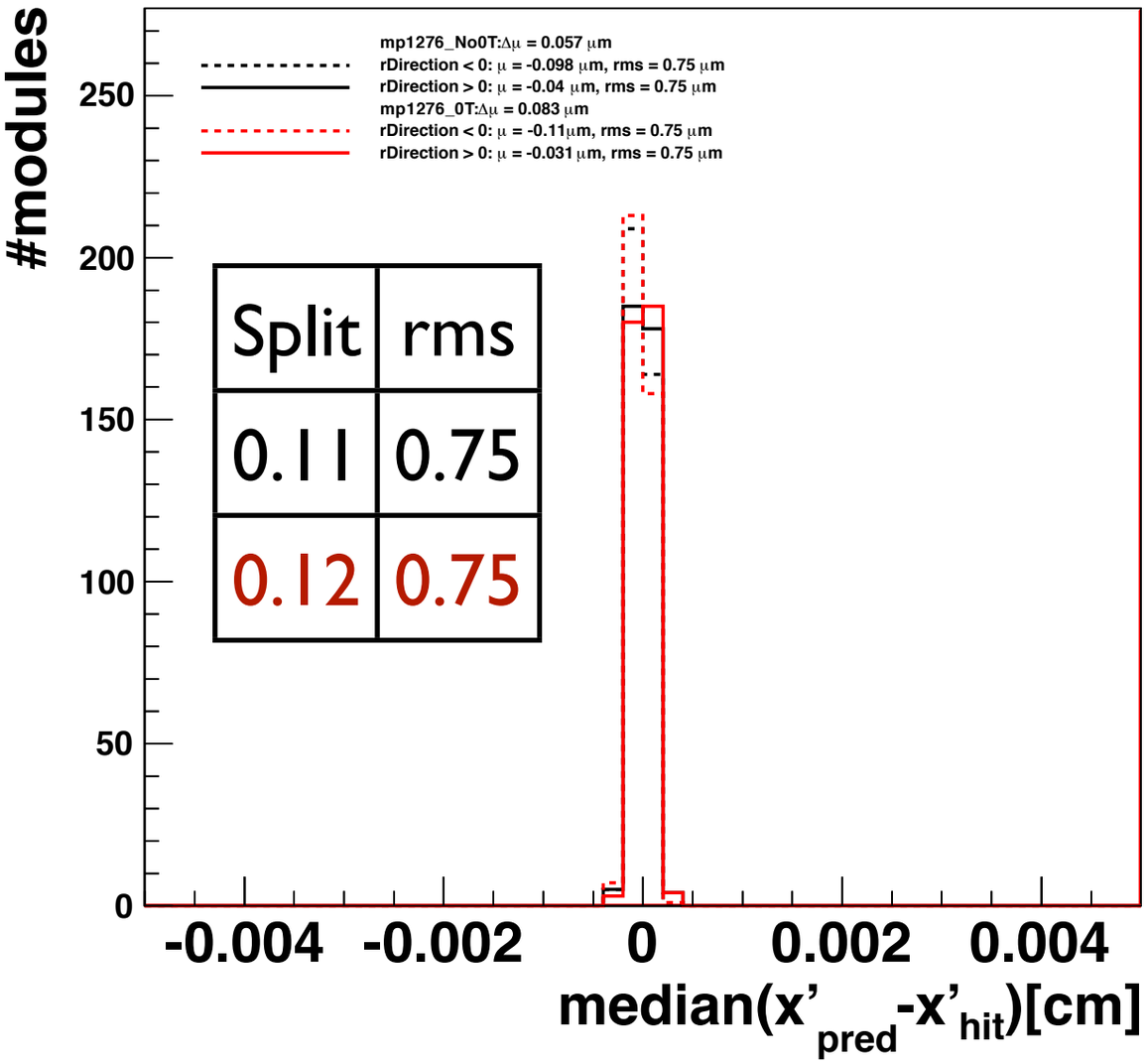
Split	rms
0.11	2.2
0.12	2.2

2.5 M tracks : Pt ~7 GeV

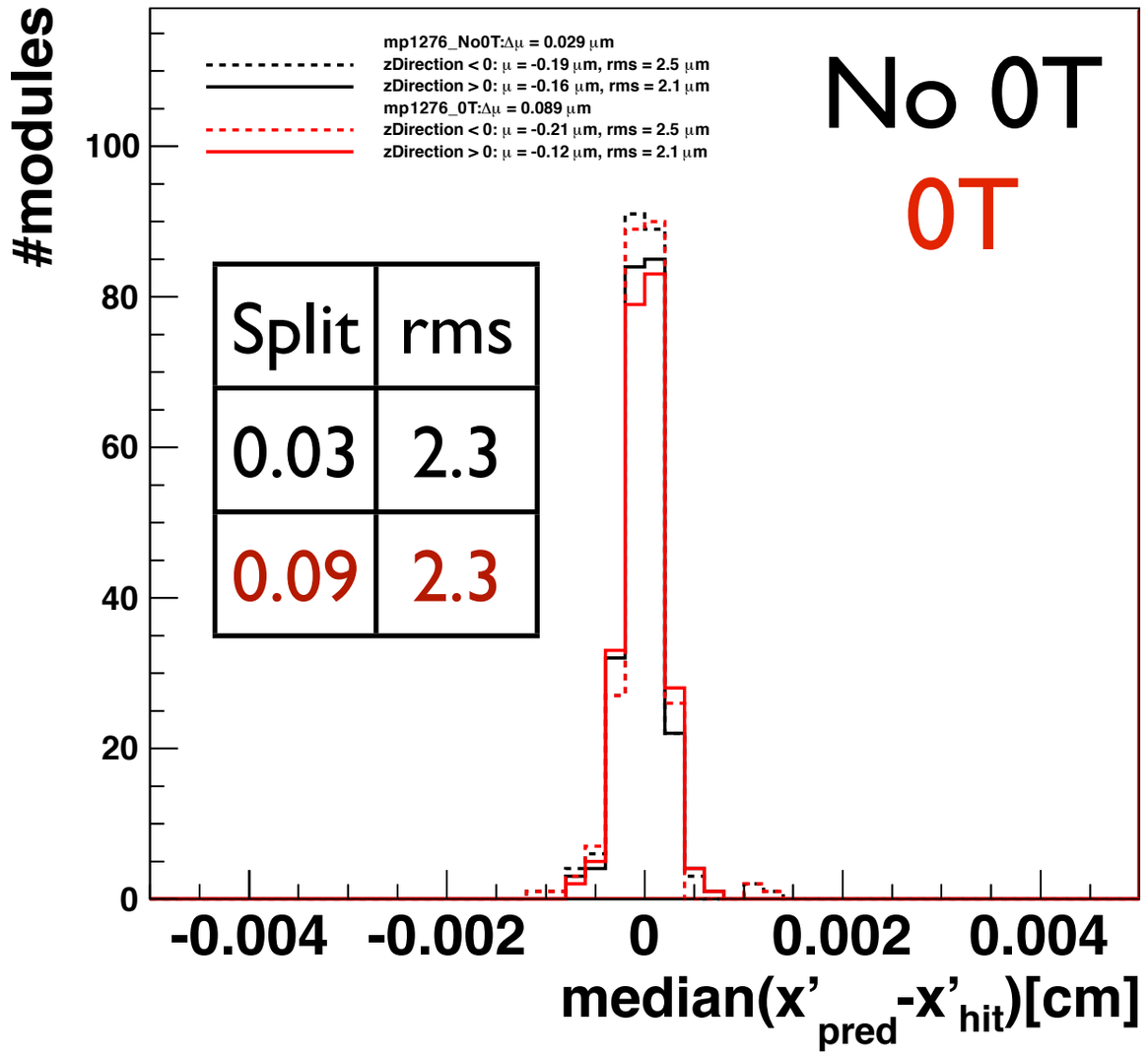
Not used in alignment

UpsilonToMuMu validation: 3.8T

Distribution of the median of the residuals in TPB



Distribution of the median of the residuals in TPE

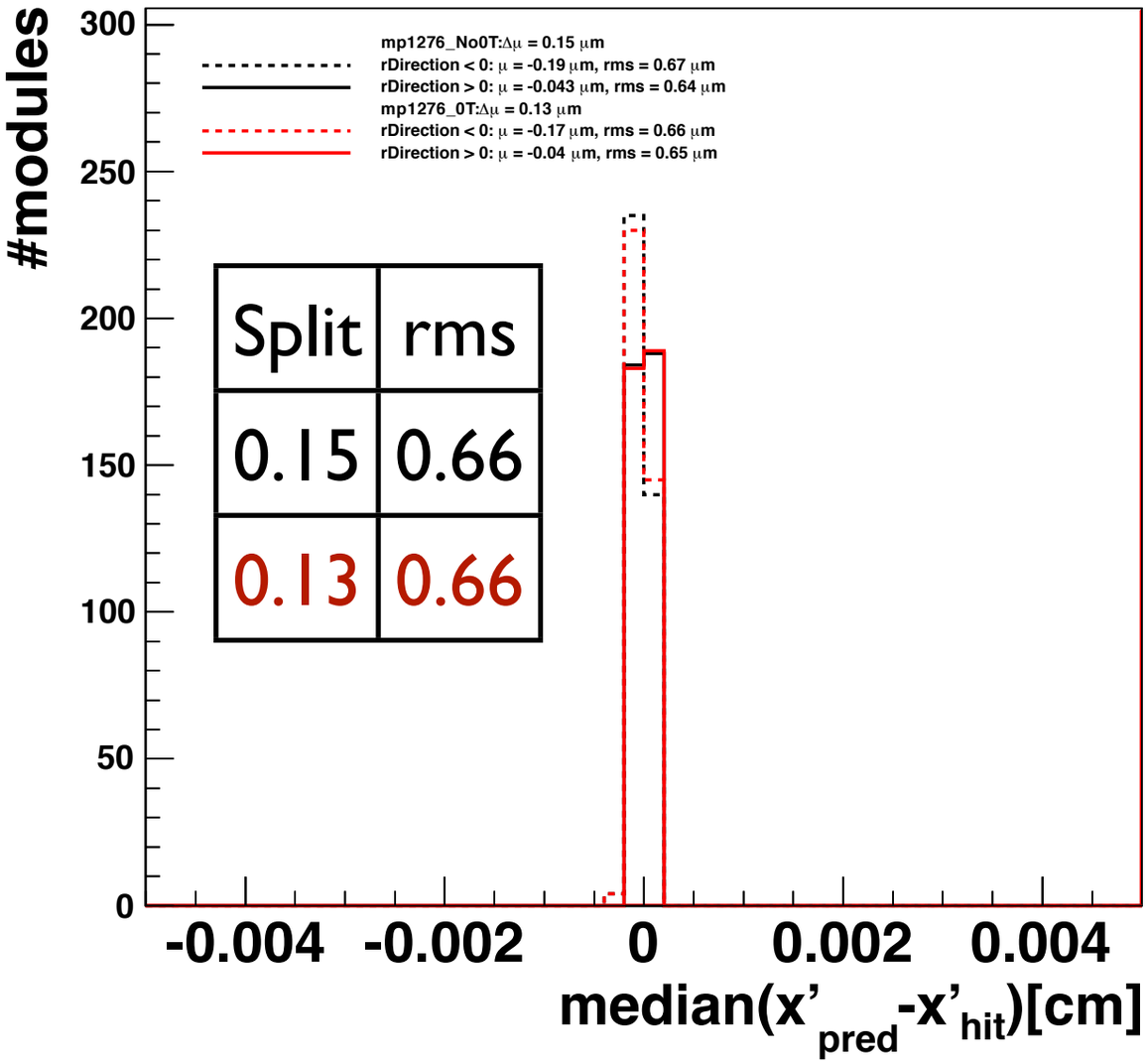


1.9 M tracks : Pt ~13.8 GeV

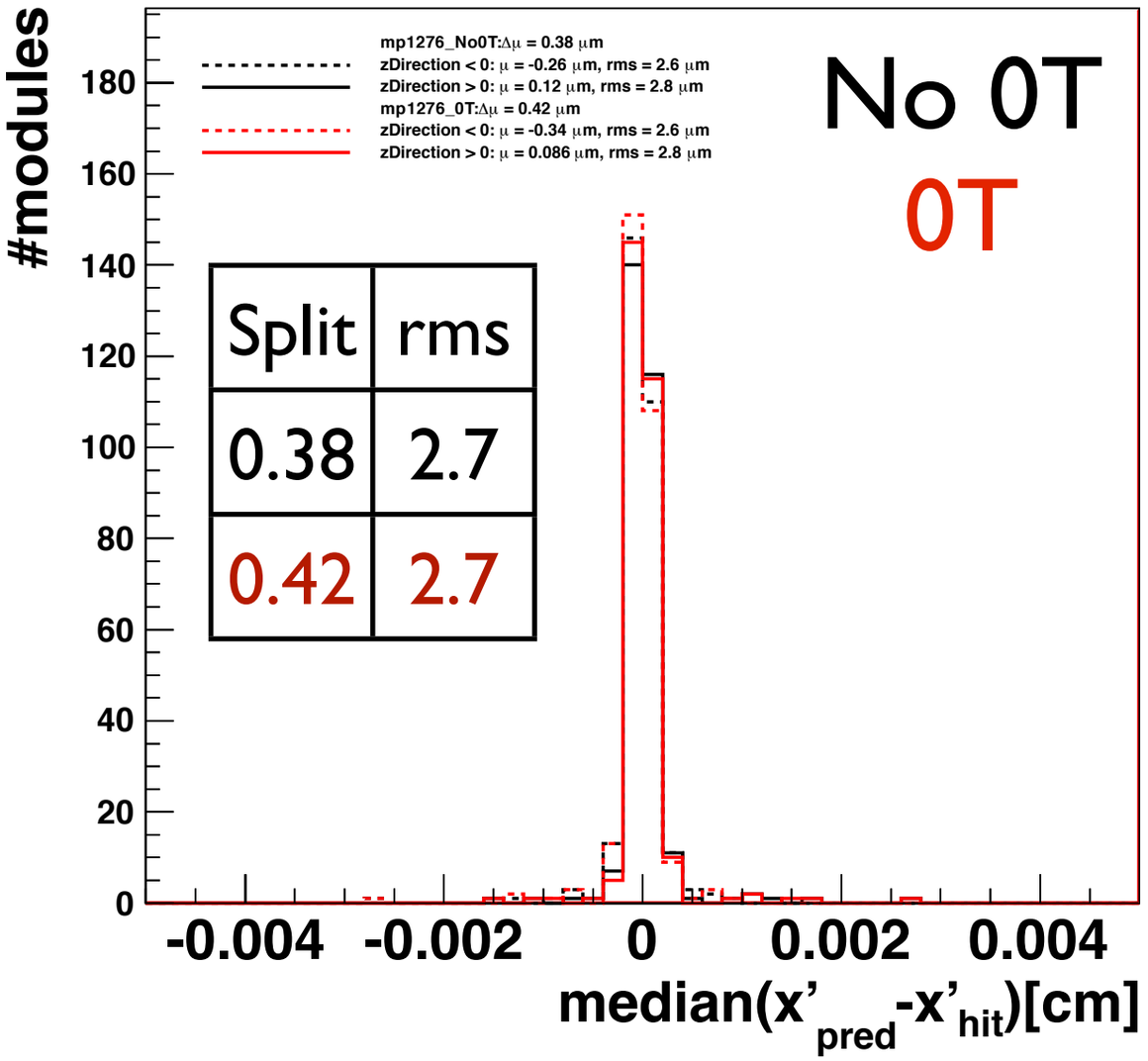
Not used in alignment

Single Muon validation: 3.8T

Distribution of the median of the residuals in TPB



Distribution of the median of the residuals in TPE

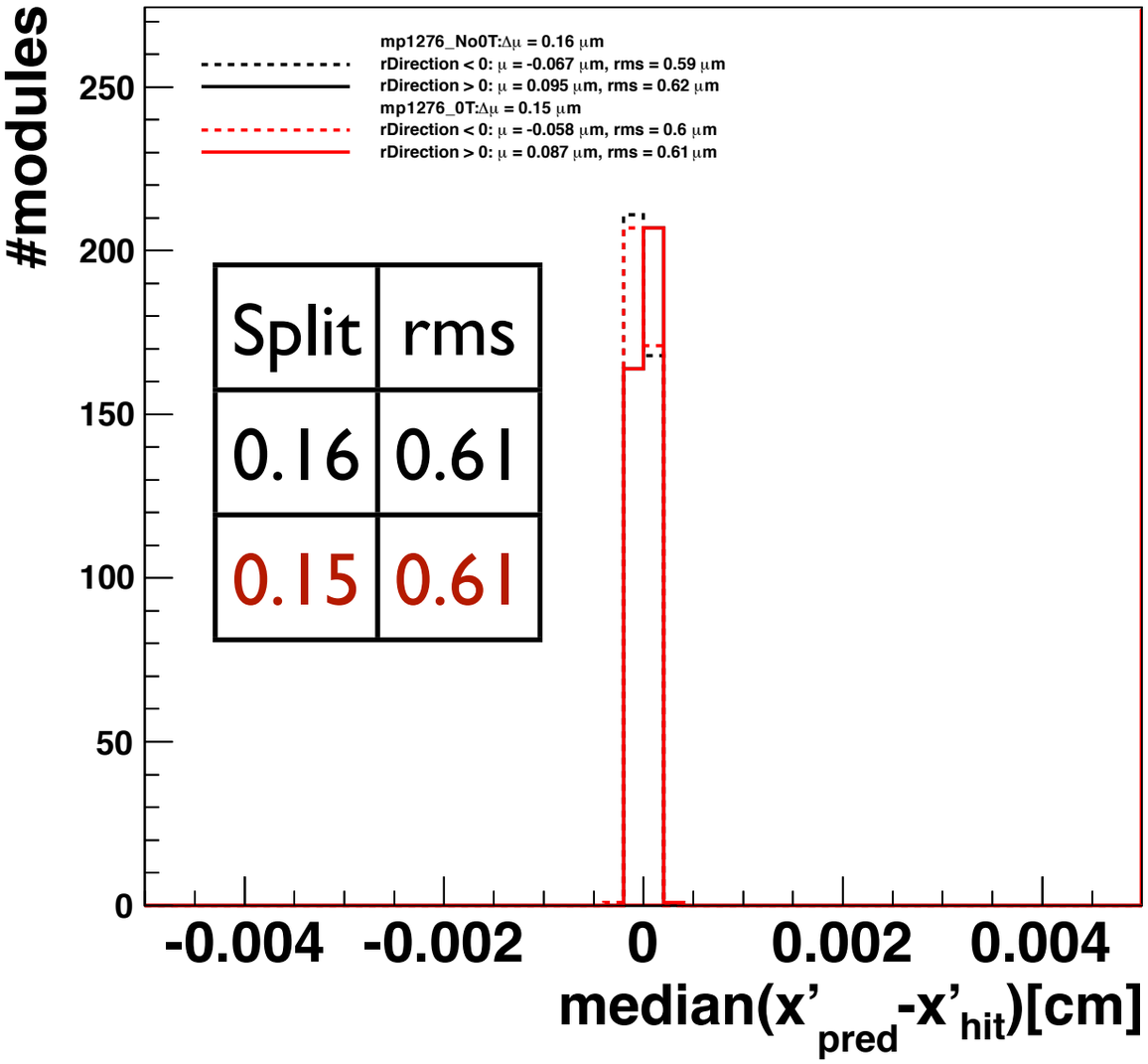


2.3 M tracks : Pt ~37 GeV

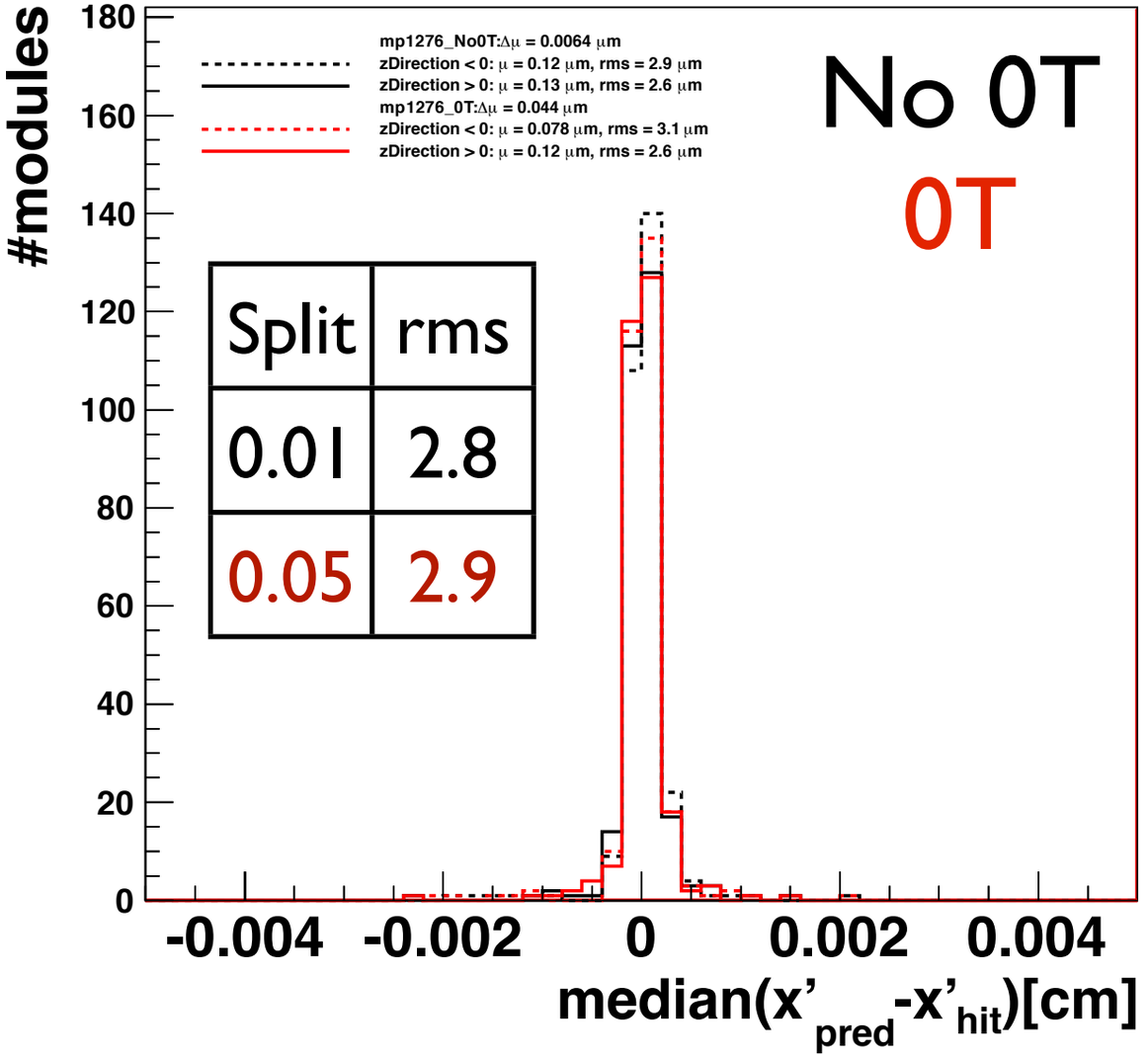
2012B Not used in alignment

Single Muon validation: 3.8T

Distribution of the median of the residuals in TPB



Distribution of the median of the residuals in TPE

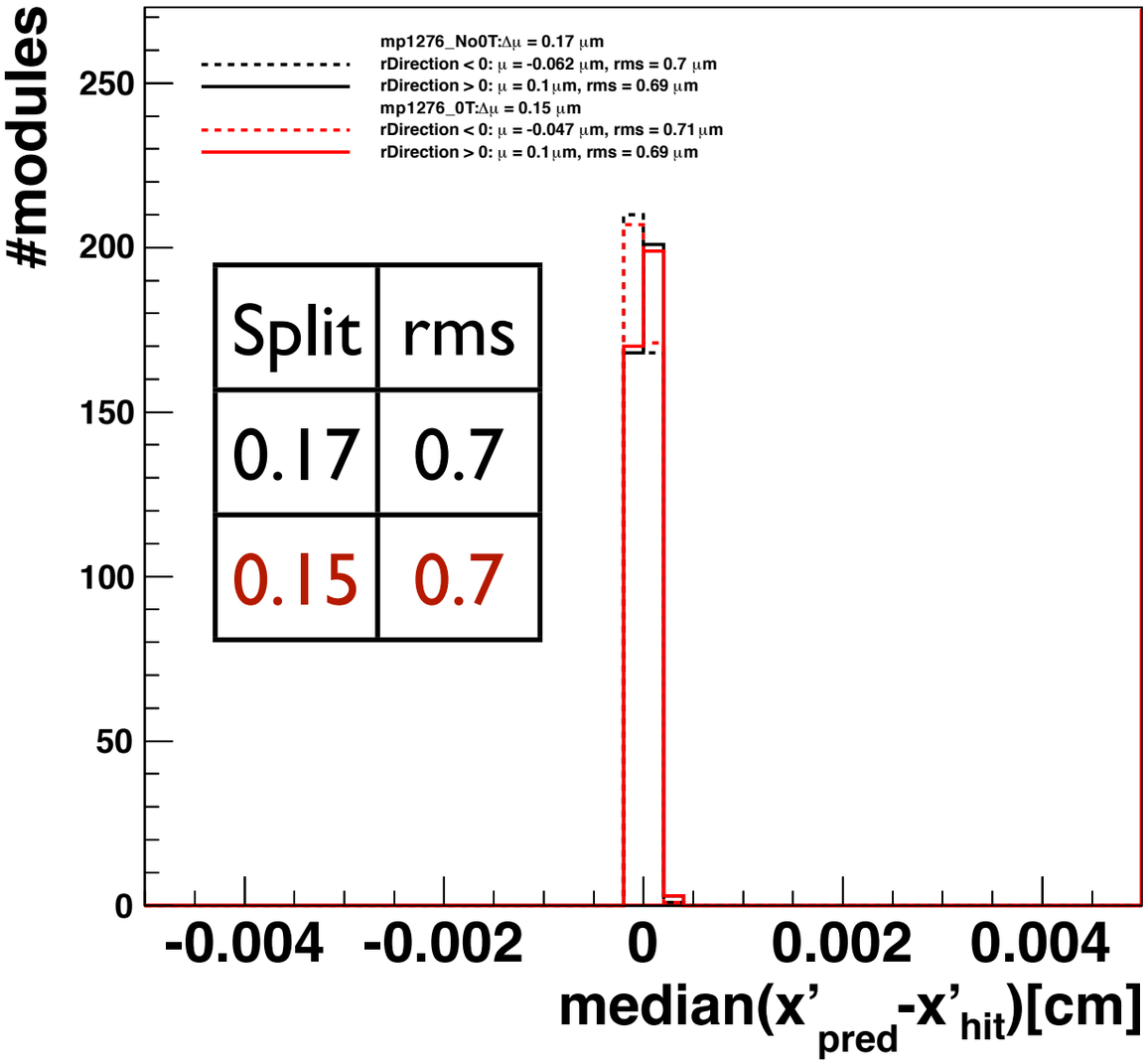


2.3 M tracks : Pt ~37 GeV

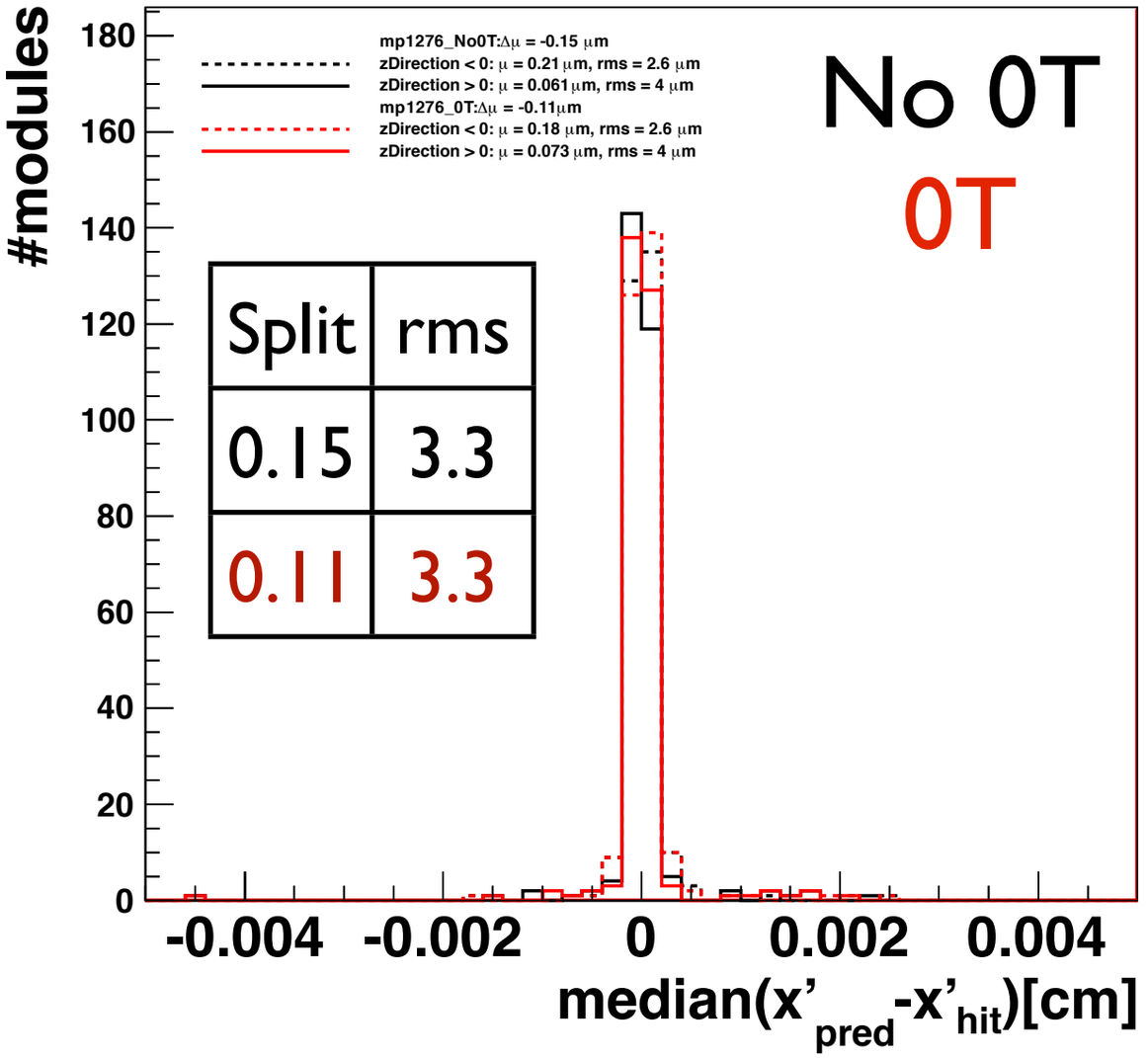
2012C Not used in alignment

Single Muon validation: 3.8T

Distribution of the median of the residuals in TPB



Distribution of the median of the residuals in TPE



2.3 M tracks : Pt ~37 GeV

2012D Not used in alignment

New alignment

- New alignment is running since yesterday evening.
- Covers full 2012 A+B+C+D data.
- Uses about 70 M tracks.
- No kinks and bows.

- New Pixel templates.
- Old Pixel LA input. (One from GT has 3 IOVs)
- Cpu load is very low during all period of job running.