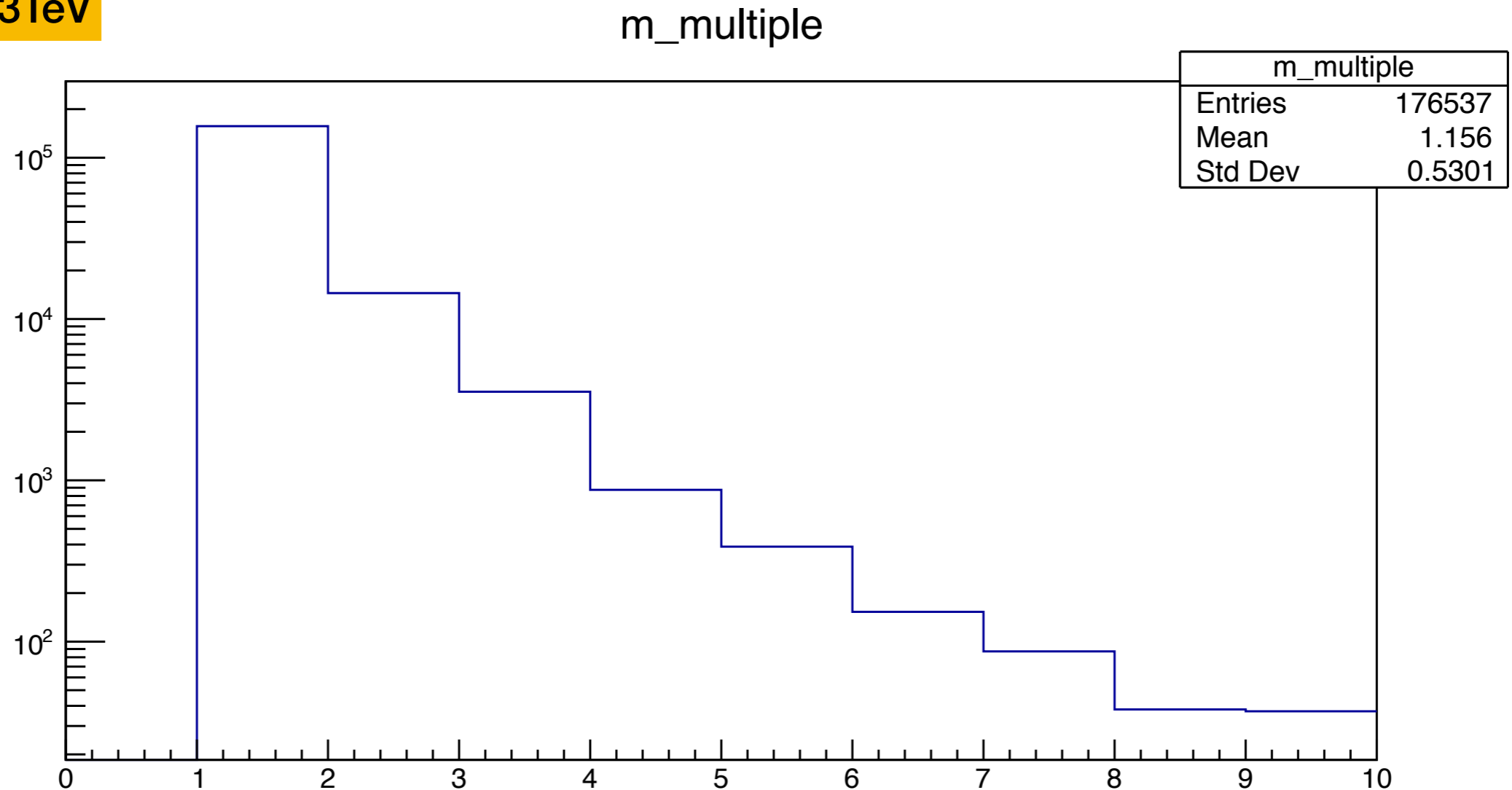


Issue of multiple tracks in conformal tracking

bbbar@3TeV



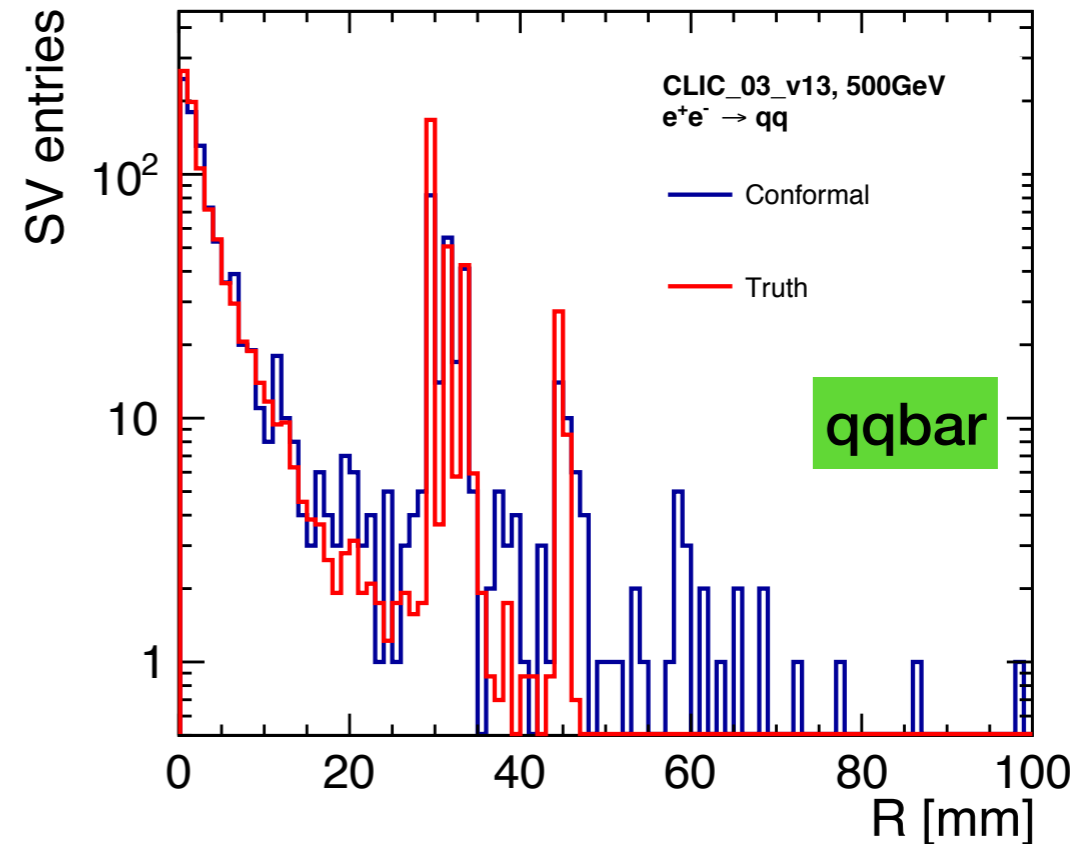
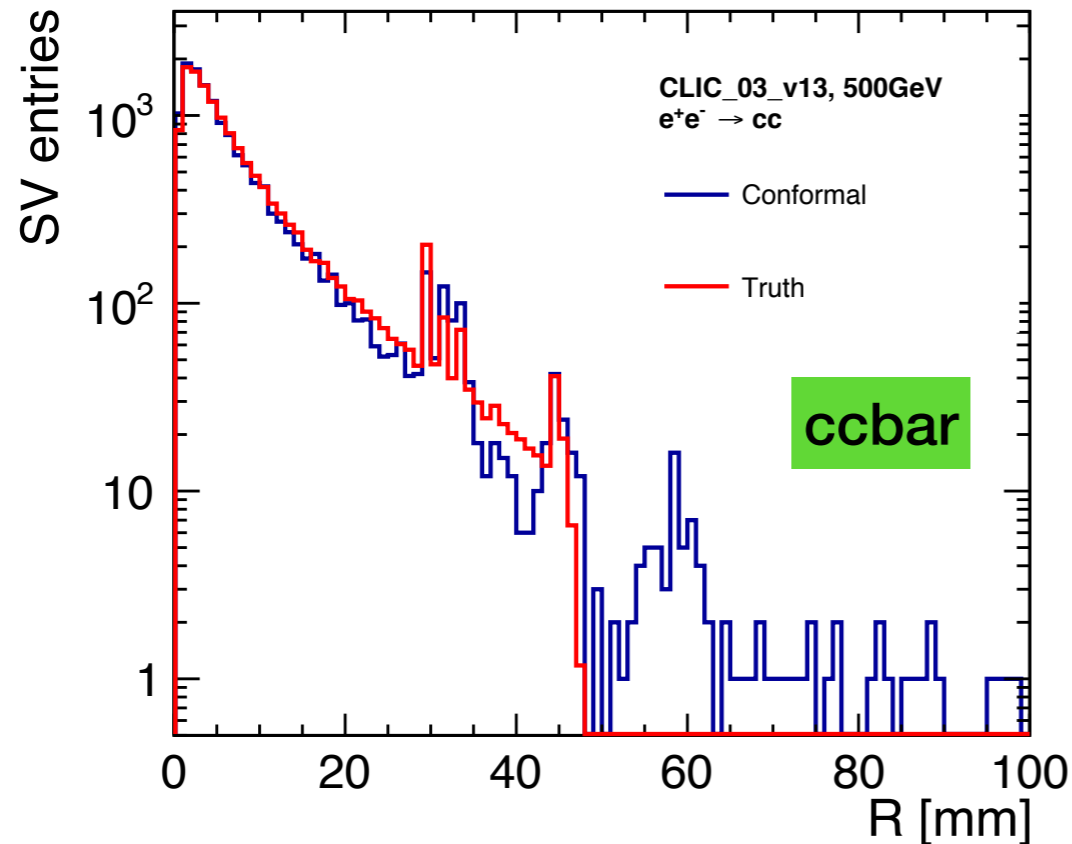
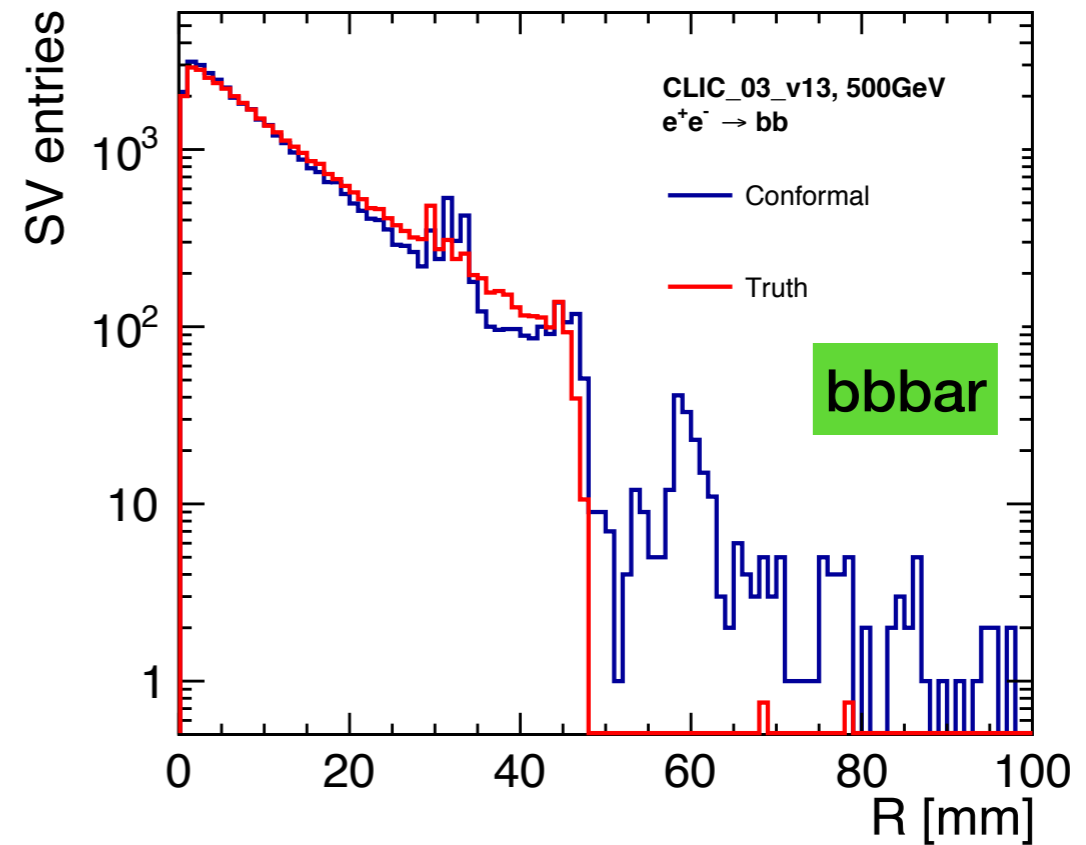
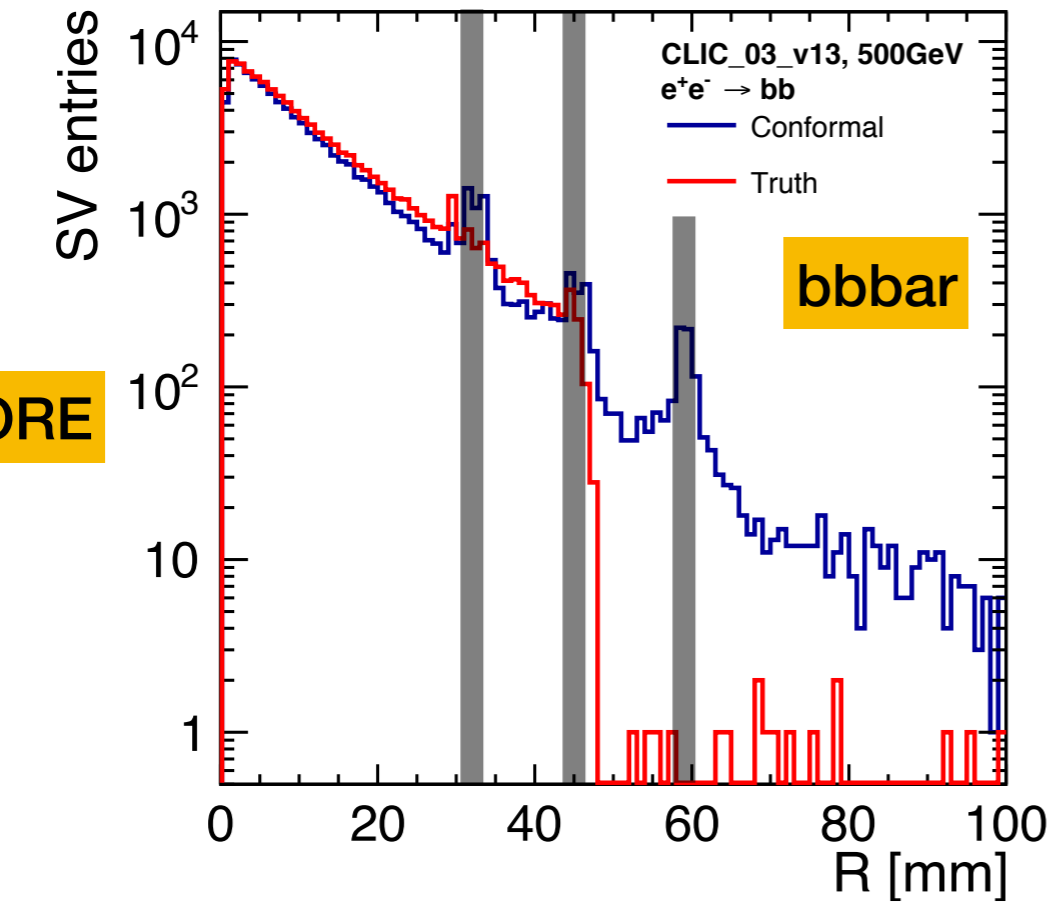
- ◆ Cases of multiple tracks per MC particle
 - ◆ $N = 2$: two pieces of what should be one track
 - ◆ $N > 2$: clones (tracks sharing more than 2 hits)

Doubles make “fake” secondary vertices

Plots from Nacho

BEFORE

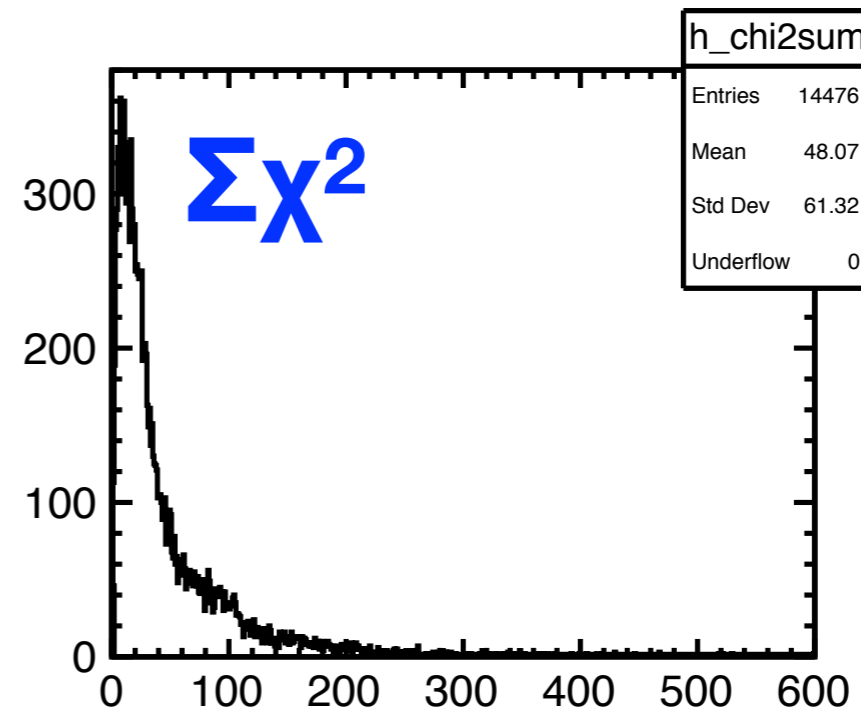
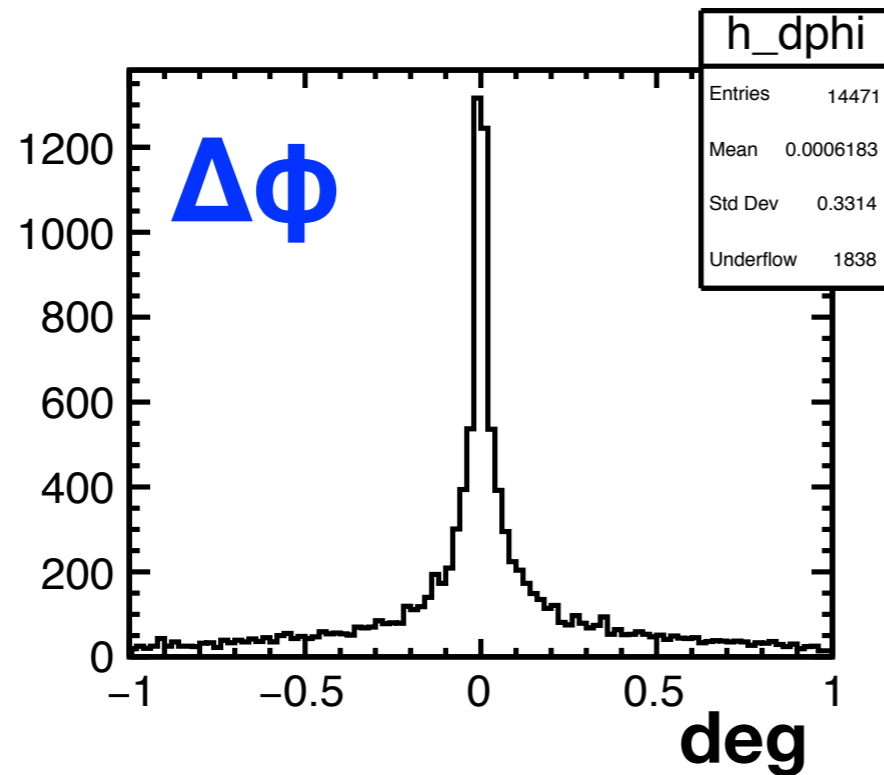
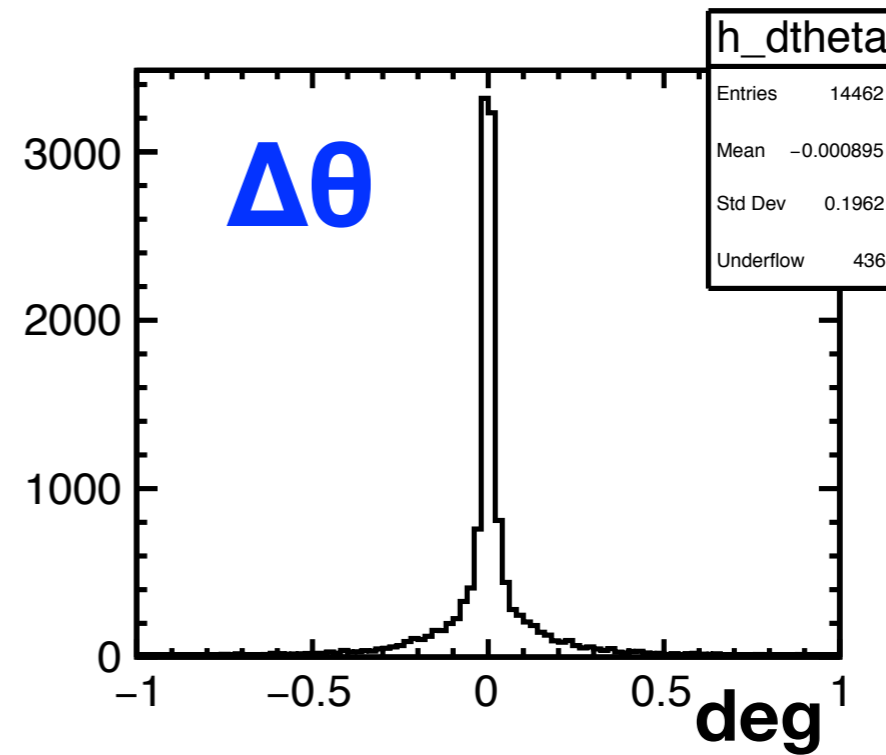
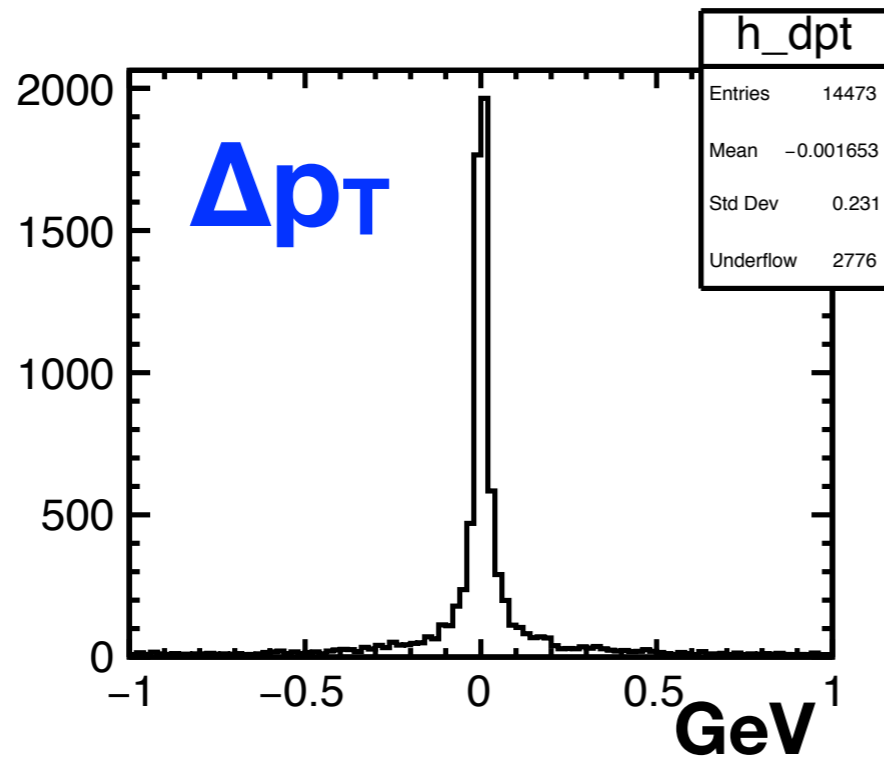
AFTER



N = 2

- ◆ How to fix this in the tracking:
 - 1) θ, ϕ matching \rightarrow
 - 2) p_T matching \rightarrow
 - 3) cut on χ^2

bbbar@3TeV



N > 2

bbbar@3TeV

MC Particle informations

PDG: -211
pT: 131.585
theta: 148.537
phi: 177.511
vertexR: 59.0738
parents: 2
Vertex parent 0 radius = 0
PDG parent 0 = 511
Vertex parent 1 radius = 59.0737
PDG parent 1 = -213

$B^0 \rightarrow \rho^- X \rightarrow \pi^- Y$

```
Tracks associated to MCParticle 0x2b256ea0 : 60.2645
Hit 0 x = -60.215      y = 2.44084      z = -98.6054
Hit 1 x = -97.109     y = 4.03314     z = -158.975
Hit 2 x = -98.3633    y = 4.08916     z = -161.025
Hit 3 x = -126.969    y = 5.31724     z = -207.82
Hit 4 x = -323.245    y = 13.5576     z = -528.851
Nr hits: 5
pt: 146.963
theta: 148.541
phi: 177.49
Chi2: 21.1228      Ndf: 5
```

1

```
Tracks associated to MCParticle 0x2b256ea0 : 60.2639
Hit 0 x = -60.215     y = 2.42691     z = -98.6481
Hit 1 x = -97.109     y = 4.03314     z = -158.975
Hit 2 x = -98.3633    y = 4.08916     z = -161.025
Hit 3 x = -126.969    y = 5.31724     z = -207.82
Hit 4 x = -1340.59    y = 45.3841     z = -2194.85
Nr hits: 5
pt: 74.7798
theta: 148.531
phi: 177.434
Chi2: 90.3492      Ndf: 5
```

2

```
Tracks associated to MCParticle 0x2b256ea0 : 60.2637
Hit 0 x = -60.215     y = 2.4228      z = -98.618
Hit 1 x = -97.109     y = 4.03314     z = -158.975
Hit 2 x = -98.3633    y = 4.08916     z = -161.025
Hit 3 x = -126.969    y = 5.31724     z = -207.82
Nr hits: 4
pt: 59.6291
theta: 148.539
phi: 177.409
Chi2: 0.254651     Ndf: 3
```

3

```
Tracks associated to MCParticle 0x2b256ea0 : 323.529
Hit 0 x = -323.245    y = 13.5576     z = -528.851
Hit 1 x = -494.618    y = 20.4597     z = -809.149
Hit 2 x = -801.498    y = 32.1413     z = -1311.15
Hit 3 x = -991.572    y = 38.9628     z = -1621.85
Hit 4 x = -1152.07    y = 44.4415     z = -1884.15
Hit 5 x = -1341.91    y = 50.6351     z = -2194.85
Nr hits: 6
pt: 131.407
theta: 148.538
phi: 177.48
Chi2: 5.64528      Ndf: 7
```

4

```
Tracks associated to MCParticle 0x2b256ea0 : 323.529
Hit 0 x = -323.245    y = 13.5576     z = -528.851
Hit 1 x = -494.411    y = 18.2275     z = -809.149
Hit 2 x = -800.083    y = 33.1977     z = -1311.15
Hit 3 x = -1334.81    y = 78.7176     z = -2188.85
Nr hits: 4
pt: 13.7892
theta: 148.589
phi: -179.531
Chi2: 73.8259      Ndf: 3
```

5

```
Tracks associated to MCParticle 0x2b256ea0 : 323.529
Hit 0 x = -323.245    y = 13.5576     z = -528.851
Hit 1 x = -493.412    y = 23.3575     z = -809.149
Hit 2 x = -980.473    y = 52.4471     z = -1615.85
Nr hits: 3
pt: 201.35
theta: 148.786
phi: 176.834
Chi2: 59.217       Ndf: 1
```

6

N > 2

bbbar@3TeV

MC Particle informations

PDG: -211
pT: 131.585
theta: 148.537
phi: 177.511
vertexR: 59.0738
parents: 2
Vertex parent 0 radius = 0
PDG parent 0 = 511
Vertex parent 1 radius = 59.0737
PDG parent 1 = -213

$B^0 \rightarrow \rho^- X \rightarrow \pi^- Y$

Tracks associated to MCParticle 0x2b256ea0 : 60.2645

Hit 0 x = -60.215 y = 2.44084 z = -98.6054
Hit 1 x = -97.109 y = 4.03314 z = -158.975
Hit 2 x = -98.3633 y = 4.08916 z = -161.025
Hit 3 x = -126.969 y = 5.31724 z = -207.82
Hit 4 x = -323.245 y = 13.5576 z = -528.851

Nr hits: 5
pt: 146.963
theta: 148.541
phi: 177.49
Chi2: 21.1228 Ndf: 5

1

Tracks associated to MCParticle 0x2b256ea0 : 60.2639

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Hit 2 x = -98.3633 y = 4.08916 z = -161.025
Hit 3 x = -126.969 y = 5.31724 z = -207.82
Hit 4 x = -1340.59 y = 45.3841 z = -2194.85

Nr hits: 5
pt: 74.7798
theta: 148.531
phi: 177.434
Chi2: 90.3492 Ndf: 5

2

Tracks associated to MCParticle 0x2b256ea0 : 60.2637

Hit 0 x = -60.215 y = 2.4228 z = -98.618
Hit 1 x = -97.109 y = 4.03314 z = -158.975
Hit 2 x = -98.3633 y = 4.08916 z = -161.025
Hit 3 x = -126.969 y = 5.31724 z = -207.82

Nr hits: 4
pt: 59.6291
theta: 148.539
phi: 177.409
Chi2: 0.254651 Ndf: 3

3

Tracks associated to MCParticle 0x2b256ea0 : 323.529

Hit 0 x = -323.245 y = 13.5576 z = -528.851
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Hit 2 x = -801.498 y = 32.1413 z = -1311.15
Hit 3 x = -991.572 y = 38.9628 z = -1621.85
Hit 4 x = -1152.07 y = 44.4415 z = -1884.15
Hit 5 x = -1341.91 y = 50.6351 z = -2194.85

Nr hits: 6
pt: 131.407
theta: 148.538
phi: 177.48
Chi2: 5.64528 Ndf: 7

4

Tracks associated to MCParticle 0x2b256ea0 : 323.529

Hit 0 x = -323.245 y = 13.5576 z = -528.851
Hit 1 x = -494.411 y = 18.2275 z = -809.149
Hit 2 x = -800.083 y = 33.1977 z = -1311.15
Hit 3 x = -1334.81 y = 78.7176 z = -2188.85

Nr hits: 4
pt: 13.7892
theta: 148.589
phi: -179.531
Chi2: 73.8259 Ndf: 3

5

Tracks associated to MCParticle 0x2b256ea0 : 323.529

Hit 0 x = -323.245 y = 13.5576 z = -528.851
Hit 1 x = -493.412 y = 23.3575 z = -809.149
Hit 2 x = -980.473 y = 52.4471 z = -1615.85

Nr hits: 3
pt: 201.35
theta: 148.786
phi: 176.834
Chi2: 59.217 Ndf: 1

6

N > 2

bbbar@3TeV

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Hit 4	x = -323.245	y = 13.5576	z = -528.851

Nr hits: 5
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phi: 177.49
Chi2: 21.1228 Ndf: 5

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Hit 4	x = -1152.07	y = 44.4415	z = -1884.15
Hit 5	x = -1341.91	y = 50.6351	z = -2194.85

Nr hits: 6
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Hit 3	x = -126.969	y = 5.31724	z = -207.82
Hit 4	x = -1340.59	y = 45.3841	z = -2194.85

Nr hits: 5
pt: 74.7798
theta: 148.531
phi: 177.434
Chi2: 90.3492 Ndf: 5

not from MCparticle

Tracks associated to MCParticle 0x2b256ea0 : 323.529

Hit 0	x = -323.245	y = 13.5576	z = -528.851
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Hit 2	x = -800.083	y = 33.1977	z = -1311.15
Hit 3	x = -1334.81	y = 78.7176	z = -2188.85

Nr hits: 4
pt: 13.7892
theta: 148.589
phi: -179.531
Chi2: 73.8259 Ndf: 3

not from MCparticle

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Nr hits: 4
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Hit 2	x = -980.473	y = 52.4471	z = -1615.85

Nr hits: 3
pt: 201.35
theta: 148.786
phi: 176.834
Chi2: 59.217 Ndf: 1

not from MCparticle