W Test Production analysis

Comparison	Status
EVALS 1 vs EVALS 2	√
EVALS 1 vs EVALS 4	√
EVALS 1 vs p14ia	√, may be need re-analysis
Yuri's - P1 vs p14ia	not completed
Yuri's - P2 vs p14ig	√

Devika Gunarathne / Matt Posik

04-07-2016

Evals 1 vs Evals 4

Apple- to -Apple comparison

Devika Gunarathne

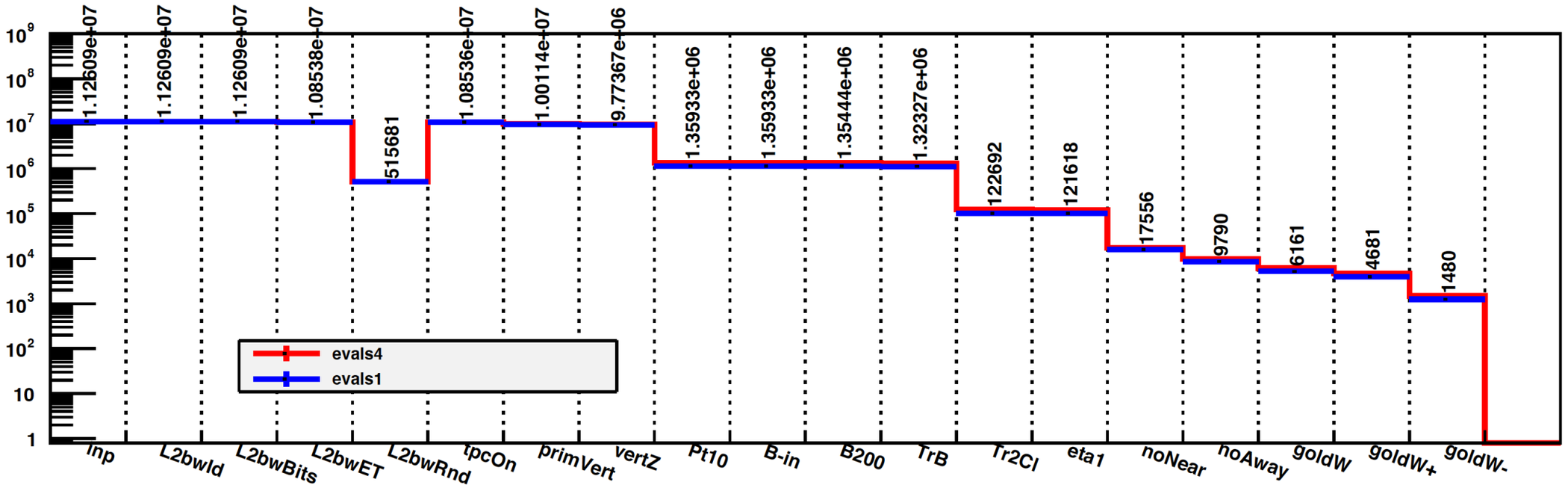
04-07-2016

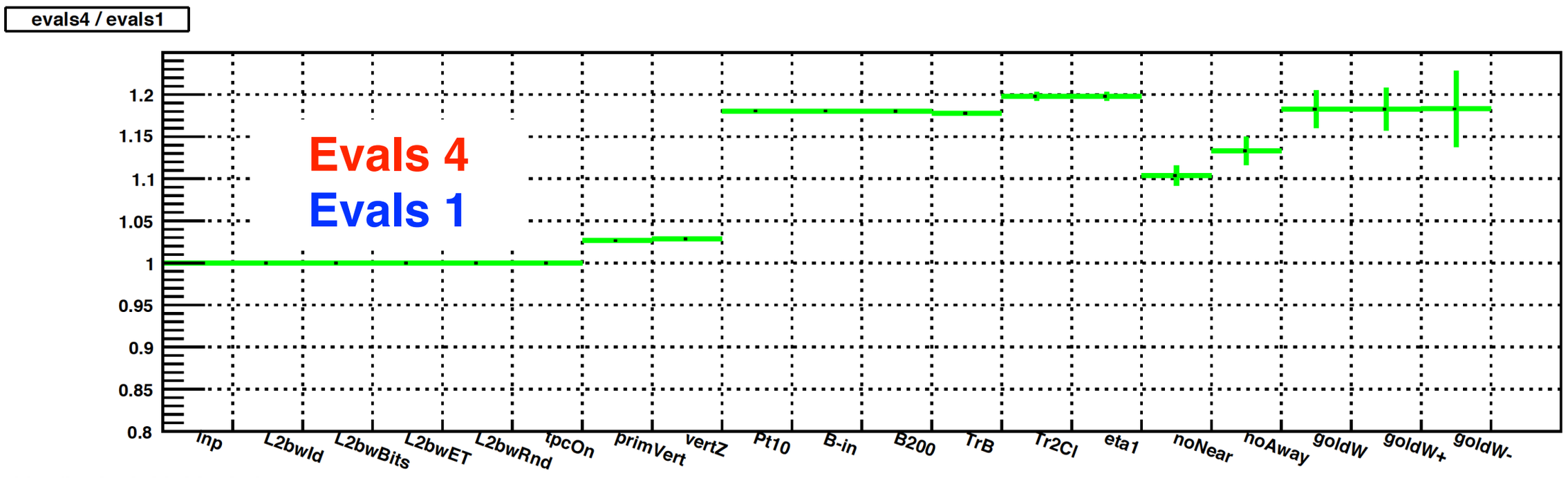
Details / Notes

Production	Production Library [also W-code compiled	Tracking	vertex finding	BEMC-gains	# of runs used in the comparison	# of events
“evals4”	EVAL	StiCA	PPV_W	run 12 - 200 GeV	896	11.26 M
“evals1”	SL16b	Sti	PPV_W	run 12 200 GeV	896	11.26 M

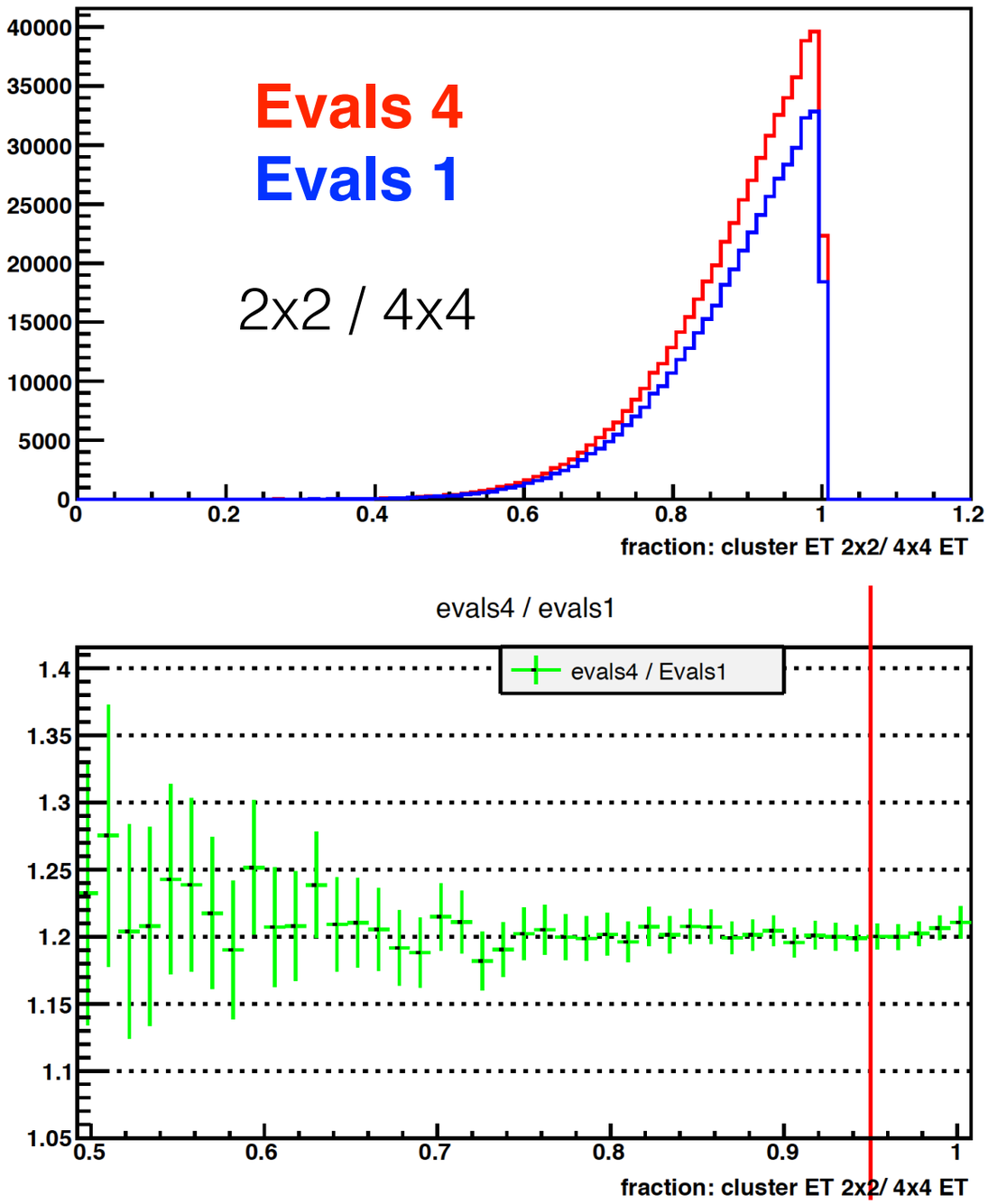
- **All the runs which were used for the comparison compared for # events processed. Runs which have processed exactly the same # of events were chosen.**
- **SL16b - https://drupal.star.bnl.gov/STAR/comp/sofi/soft-n-libs/library-release-history/2016-0#SL16b**

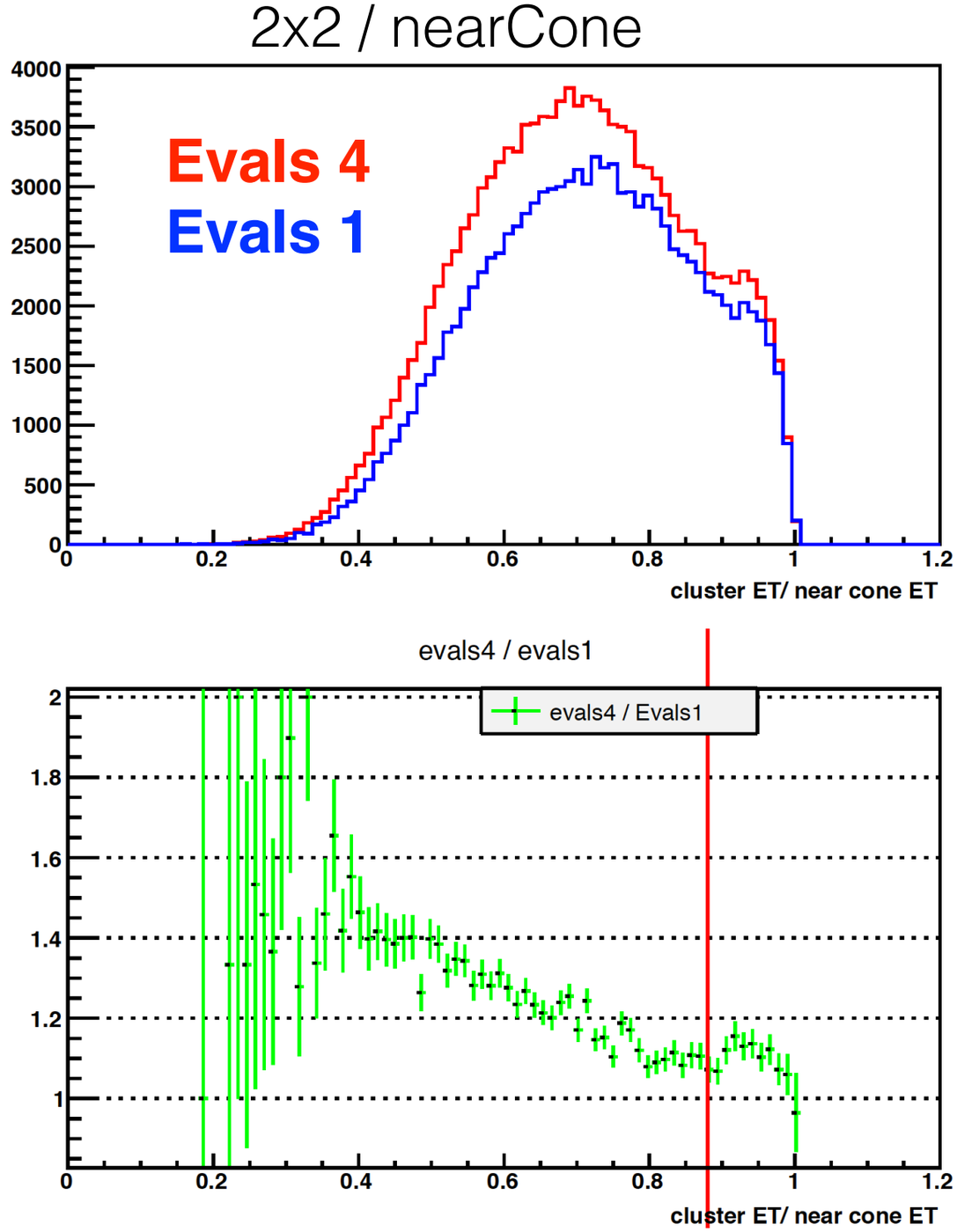
Events Counts



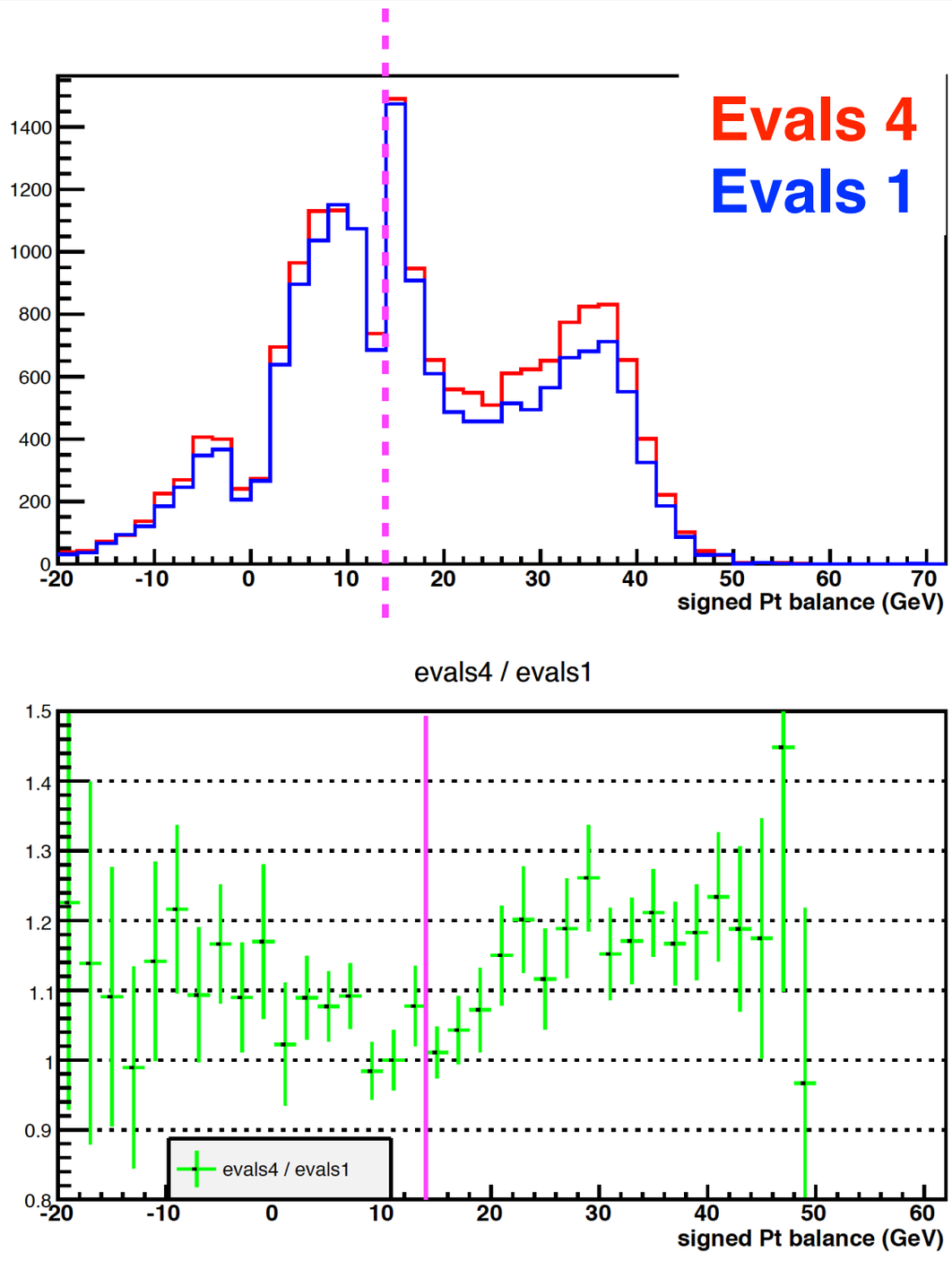


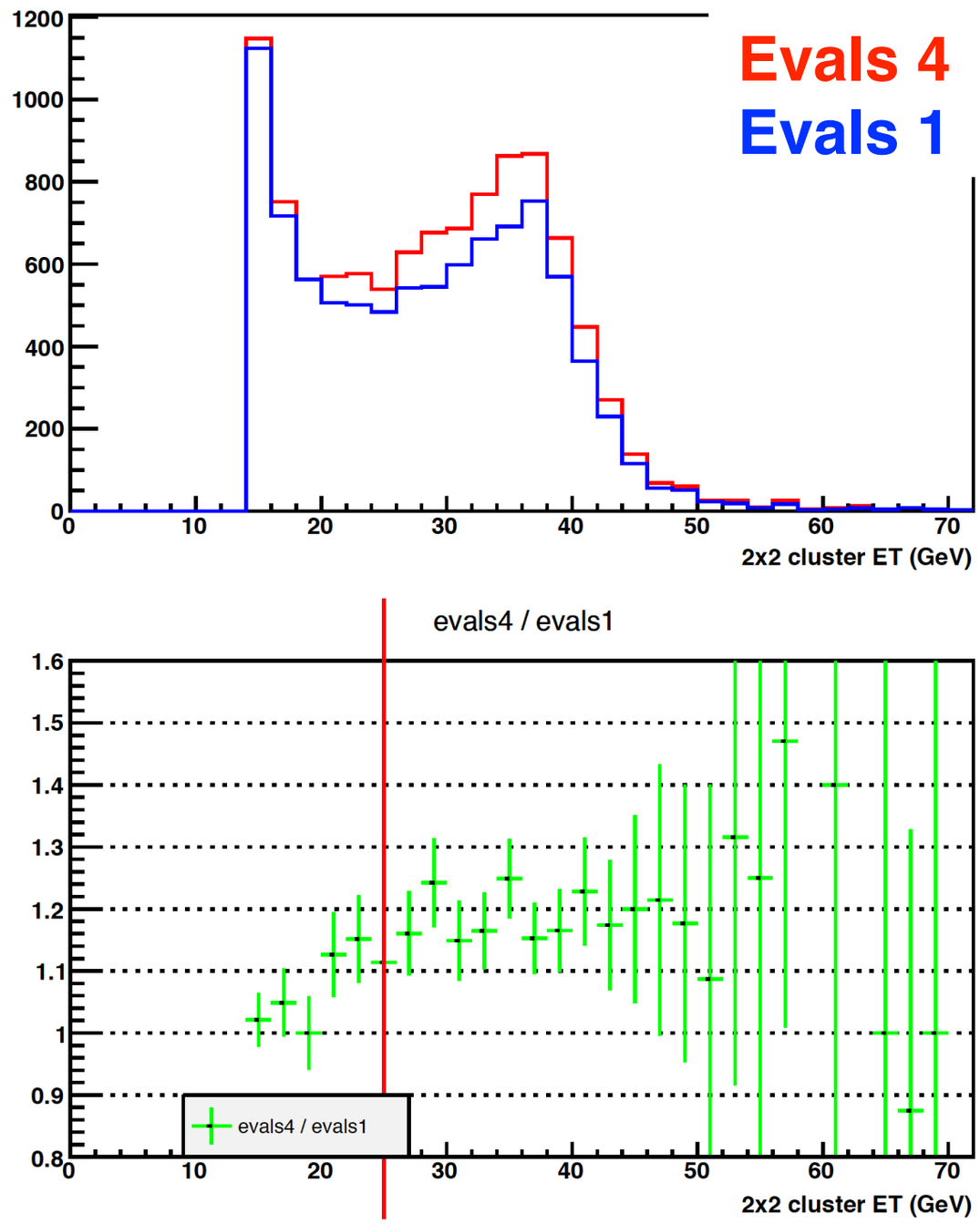
Isolation cuts



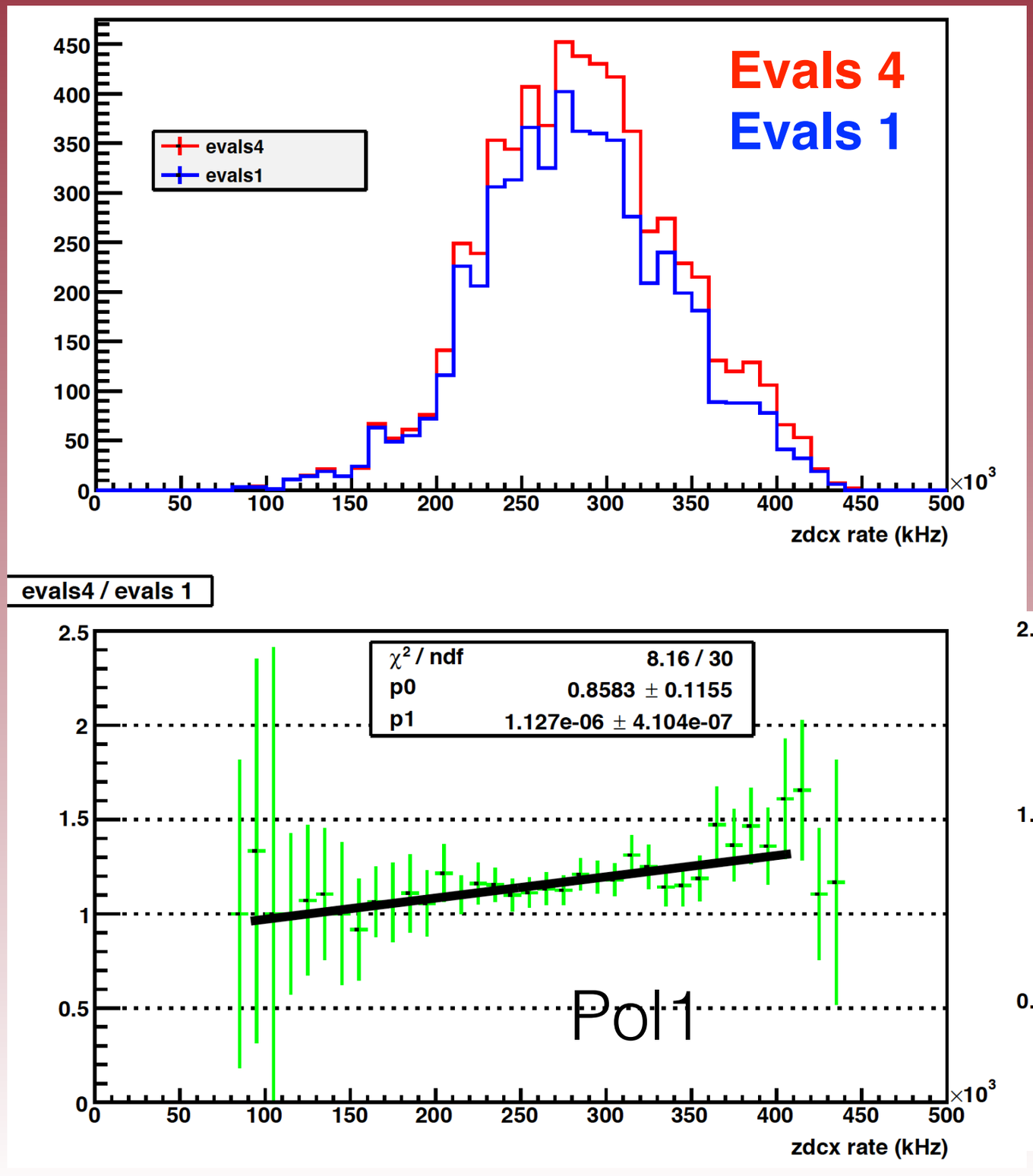


Sign Pt, Final W

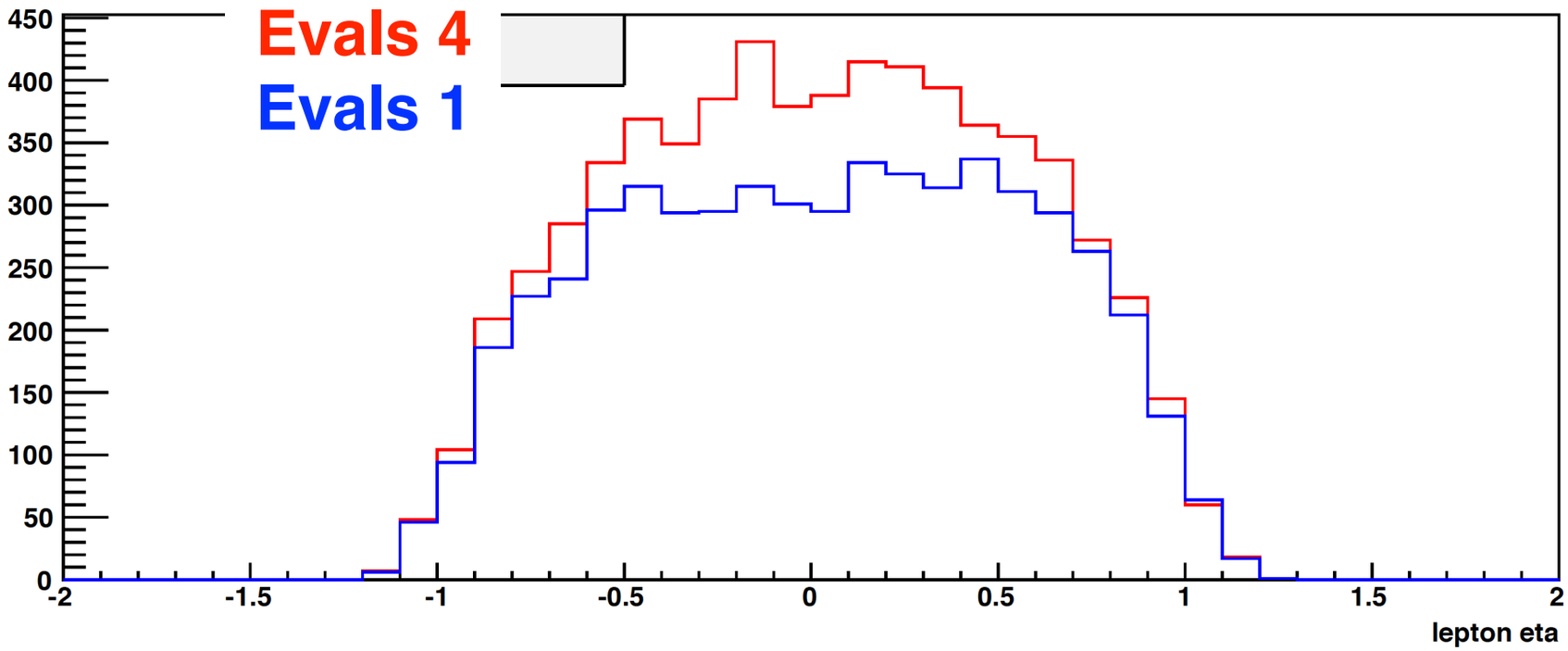


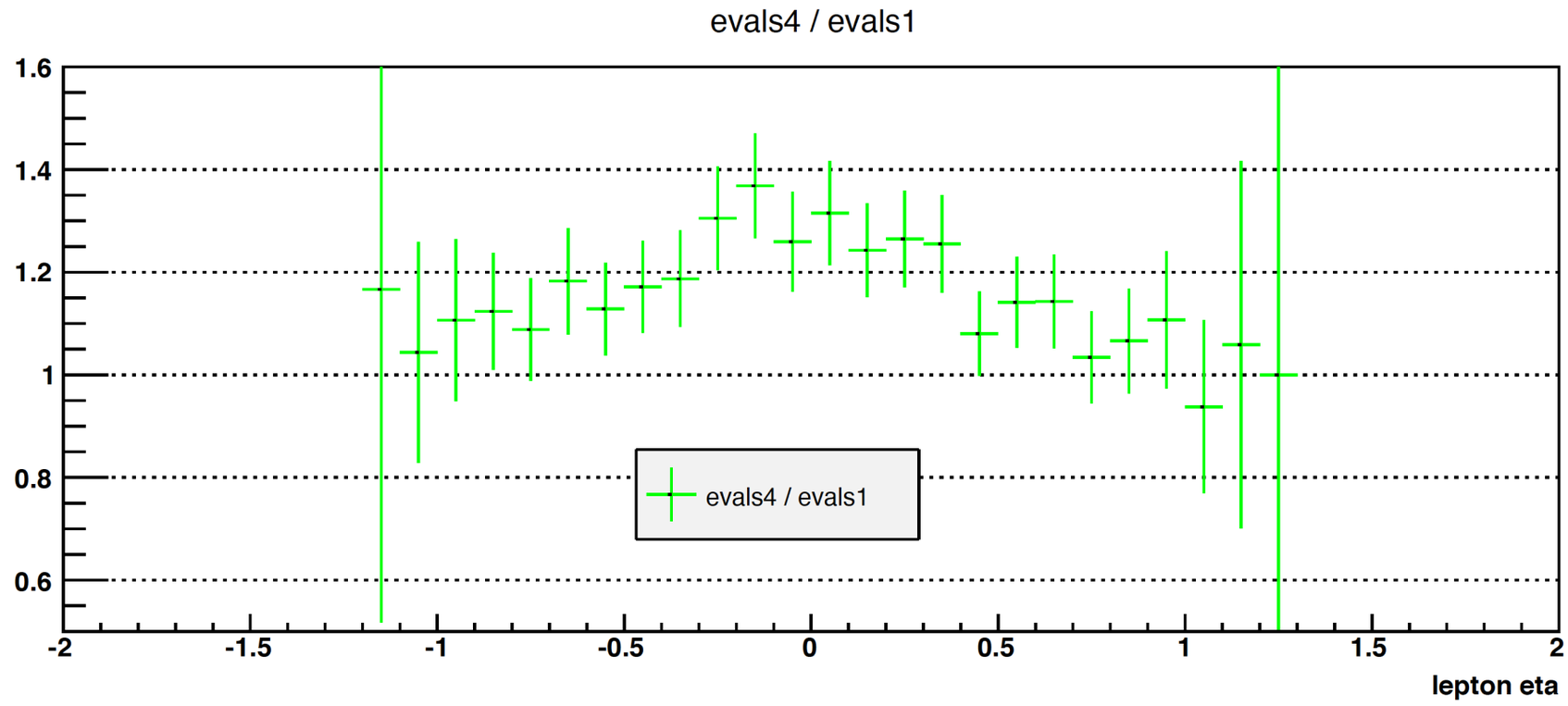


Final W ZDC

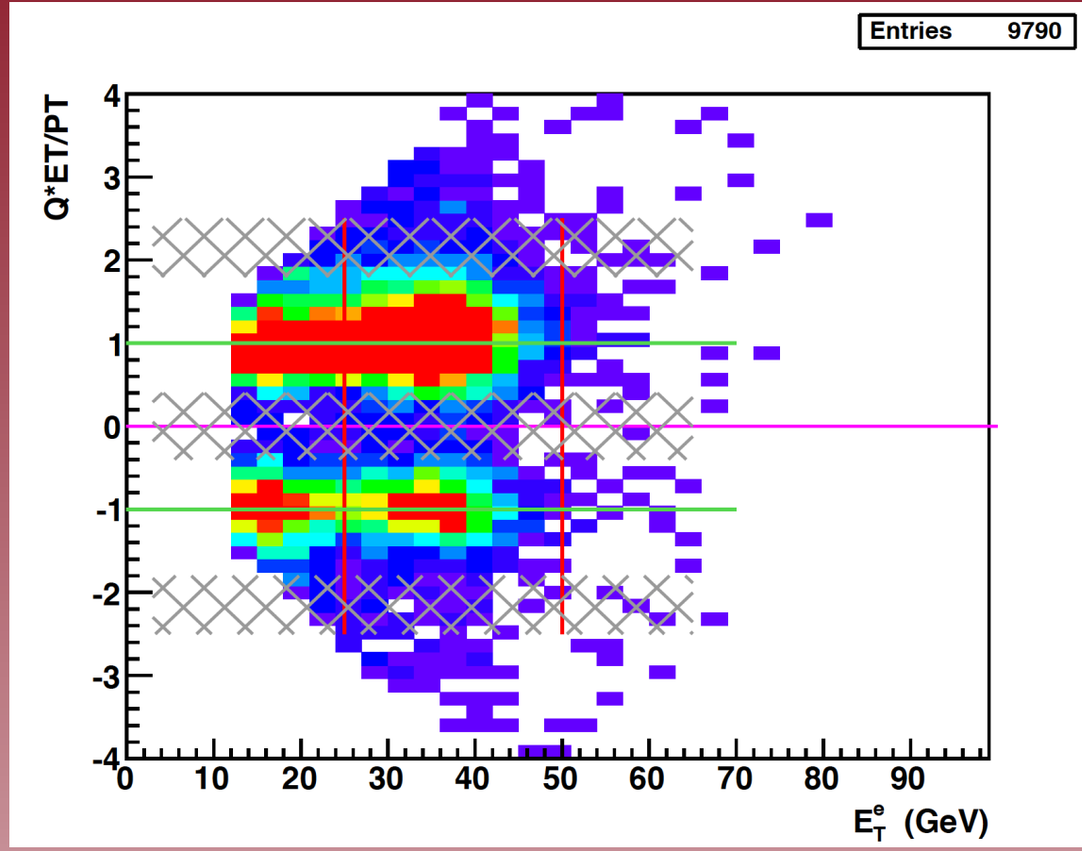

evals4
evals1
Evals 4
Evals 1
zdcx rate (kHz)
evals4 / evals 1
χ² / ndf 8.16 / 30
p0 0.8583 ± 0.1155
p1 1.127e-06 ± 4.104e-07
Pol1
zdcx rate (kHz)
χ² / ndf 17.49 / 34
p0 1.171 ± 0.022
Pol0
zdcx rate (kHz)

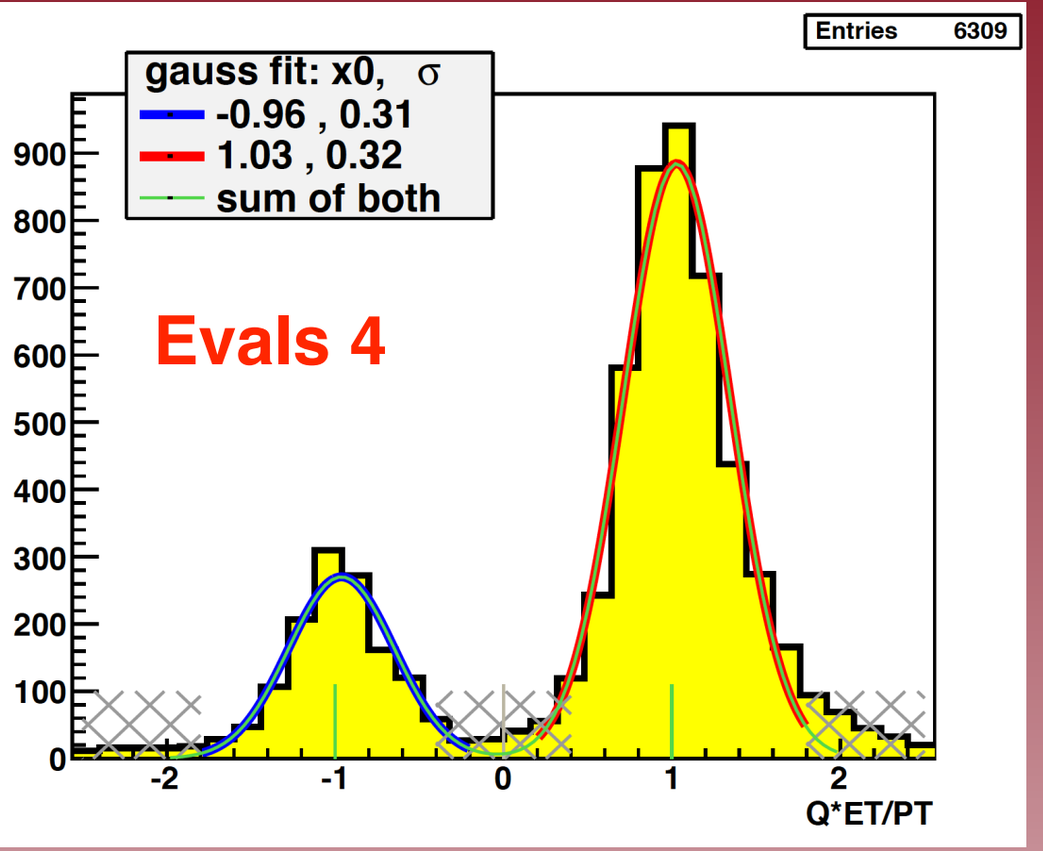
Final W Eta

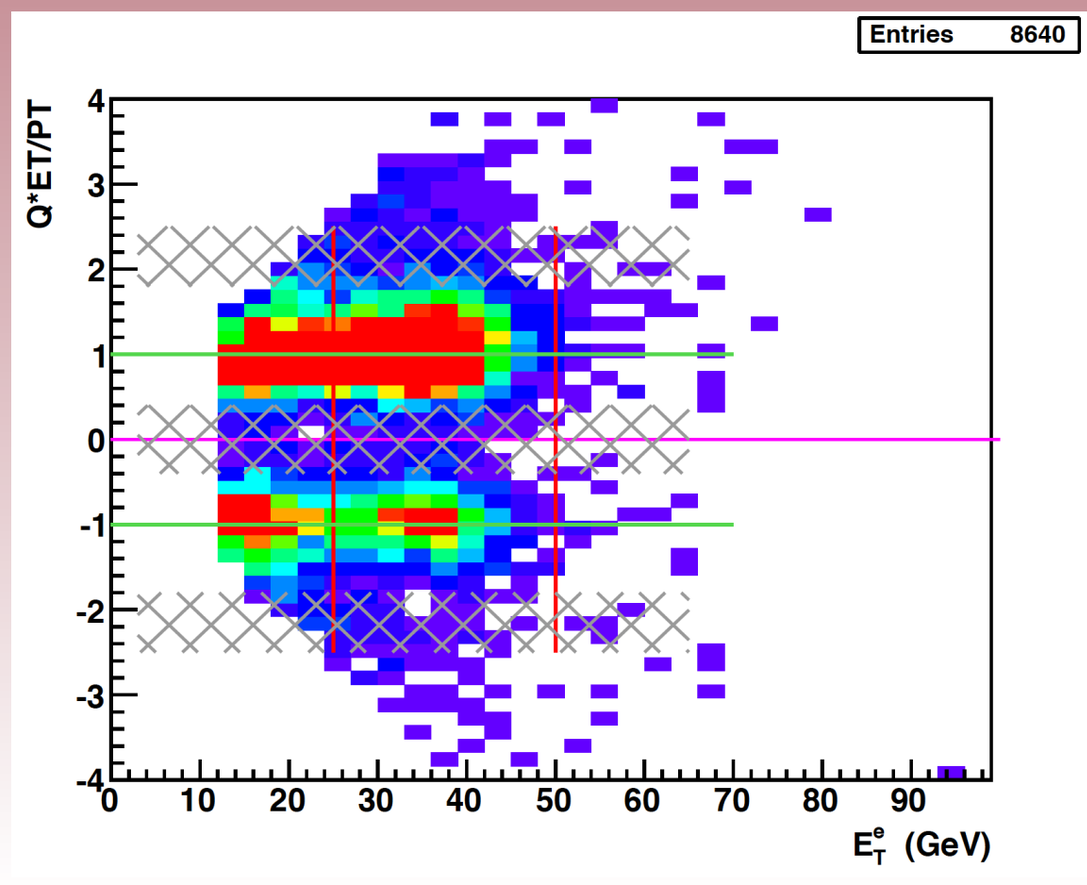

Evals 4
Evals 1
450
400
350
300
250
200
150
100
50
0
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
lepton eta

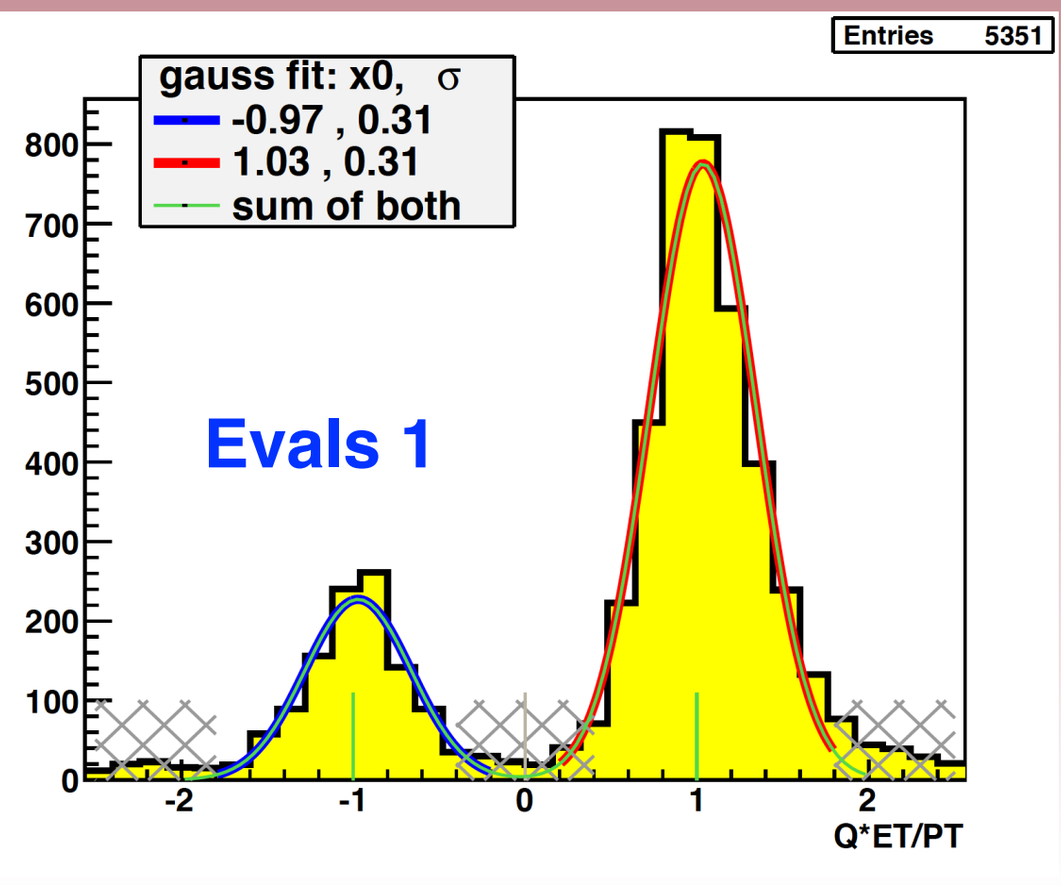

evals4 / evals1
1.6
1.4
1.2
1
0.8
0.6
evals4 / evals1
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
lepton eta

W charge Separation

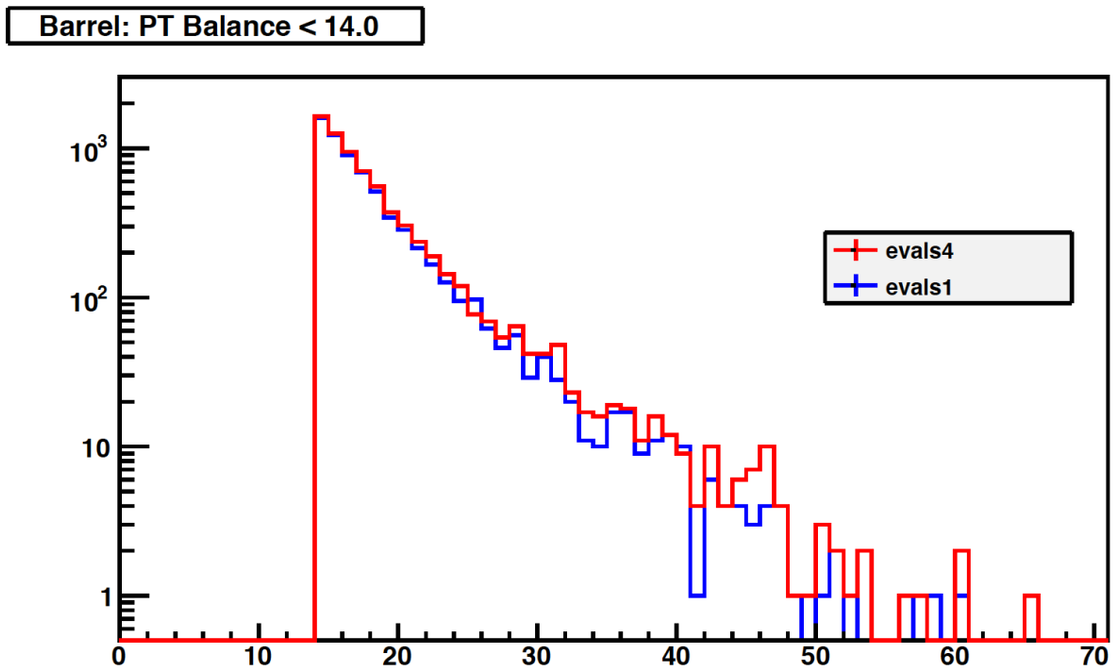


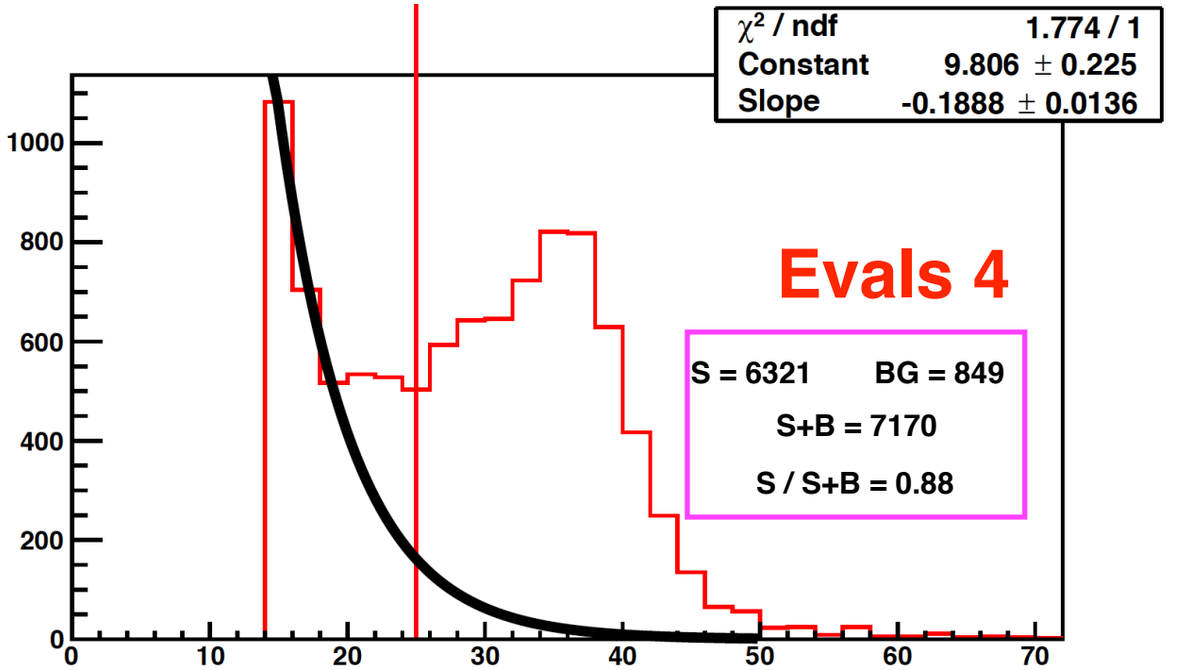


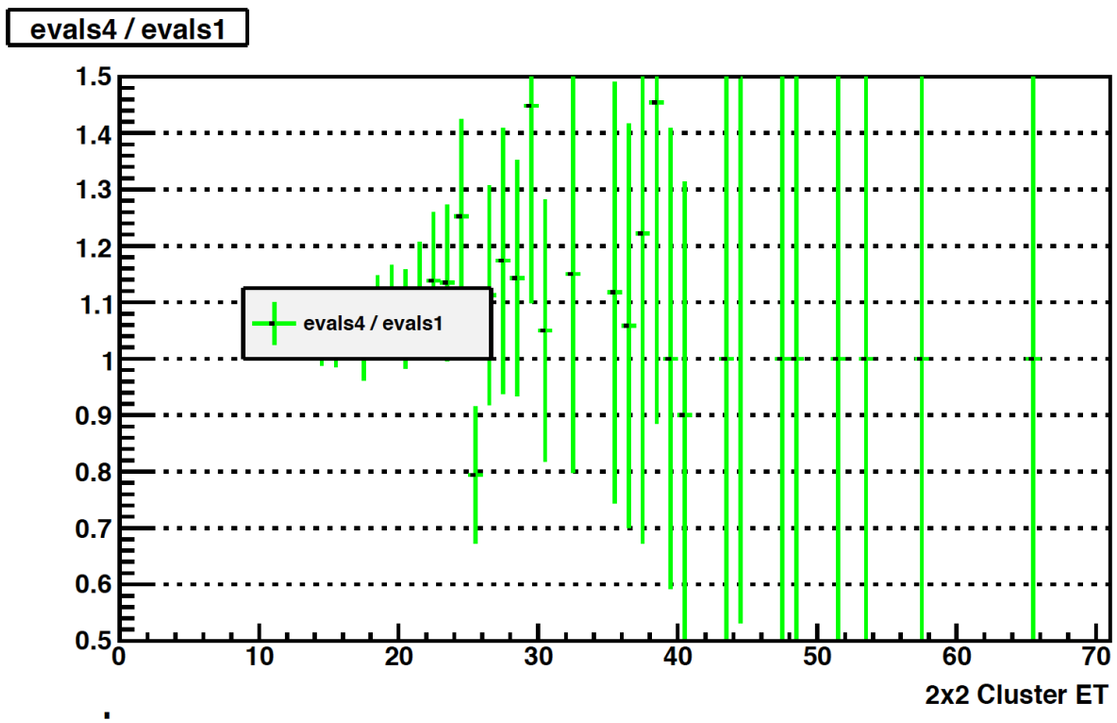


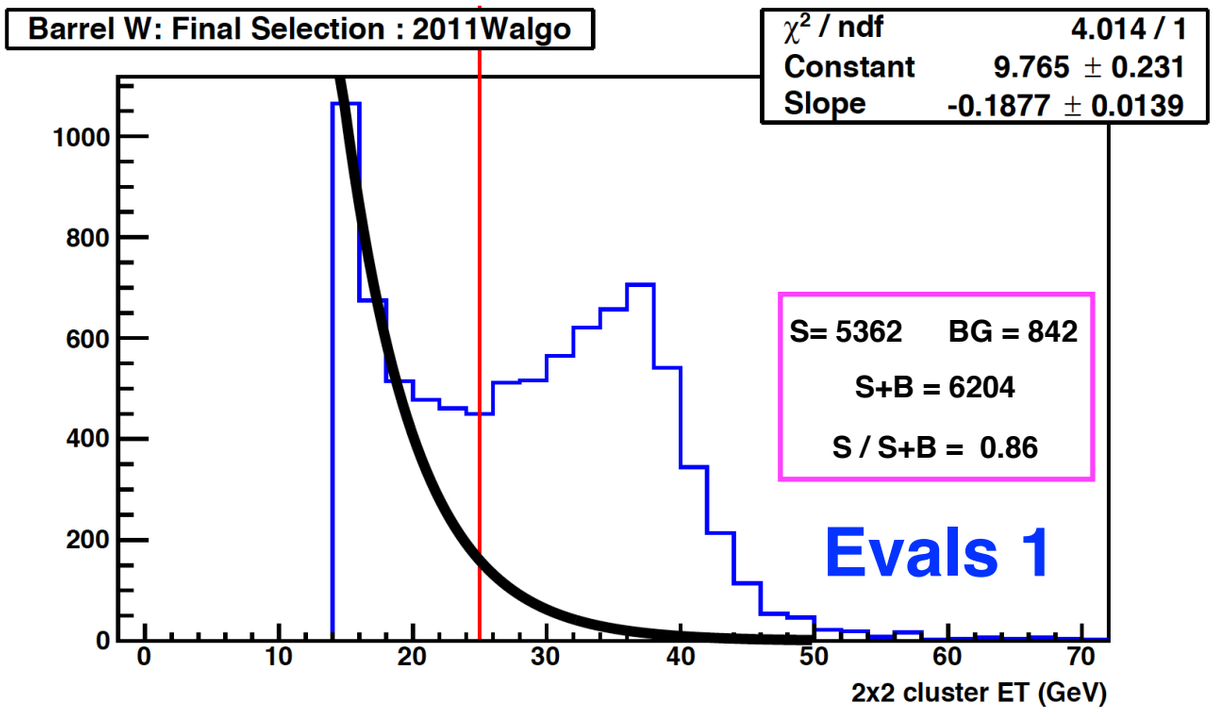


QCD BG


Barrel: PT Balance < 14.0
evals4
evals1
2x2 Cluster ET


χ² / ndf 1.774 / 1
Constant 9.806 ± 0.225
Slope -0.1888 ± 0.0136
Evals 4
S = 6321 BG = 849
S+B = 7170
S / S+B = 0.88
2x2 cluster ET (GeV)


evals4 / evals1
evals4 / evals1
2x2 Cluster ET


Barrel W: Final Selection : 2011Walgo
χ² / ndf 4.014 / 1
Constant 9.765 ± 0.231
Slope -0.1877 ± 0.0139
S= 5362 BG = 842
S+B = 6204
S / S+B = 0.86
Evals 1
2x2 cluster ET (GeV)

Summary

Evals 1 vs Evals 2

Apple- to -Apple comparison

Devika / Matt Posik

04-07-2016

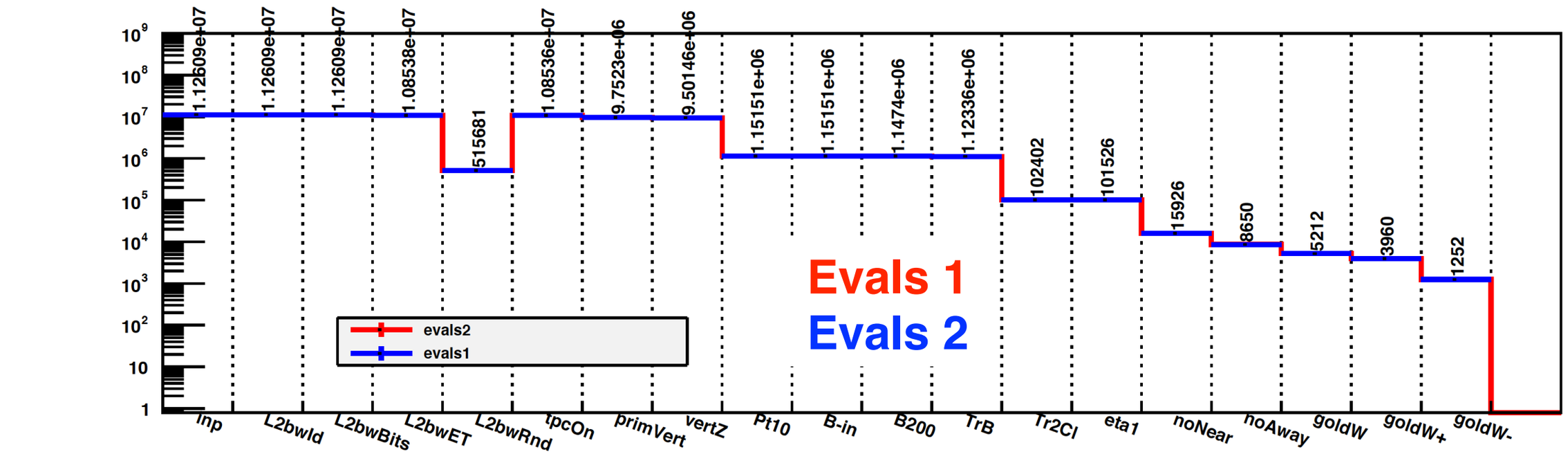
Details / Notes

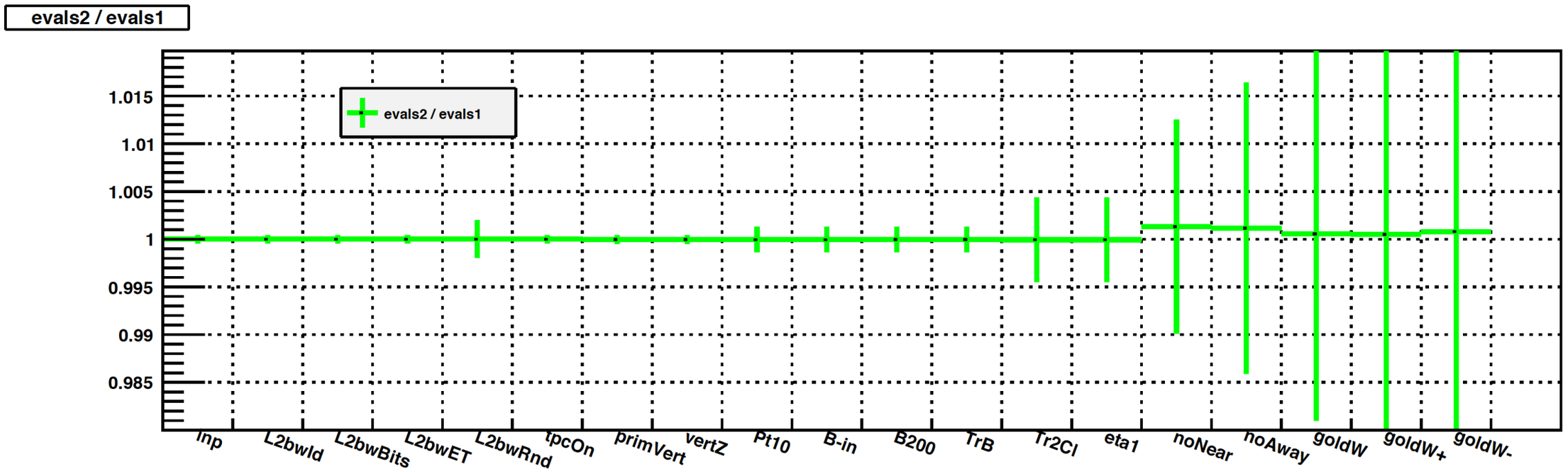
Production	Production Library [also W-code compiled	Tracking	vertex finding	BEMC-gains	# of runs used in the comparison	# of events
“evals2”	EVAL	Sti [updated]	PPV_W	run 12 - 200 GeV	896	11.26 M
“evals1”	SL16b	Sti	PPV_W	run 12 200 GeV	896	11.26 M

- **All the runs which were used for the comparison compared for # events processed. Runs which have processed exactly the same # of events were chosen.**

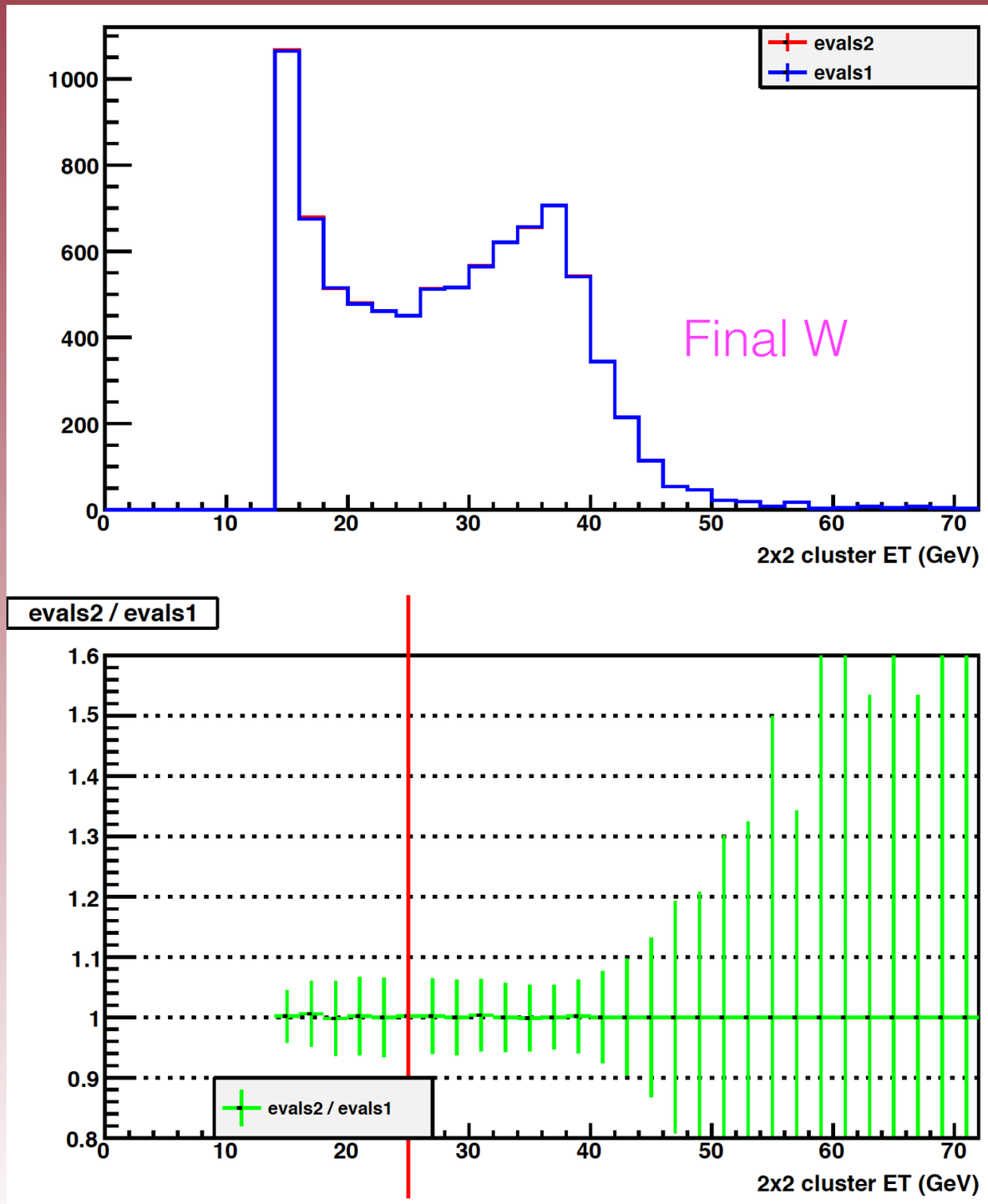
- **SL16b - https://drupal.star.bnl.gov/STAR/comp/sofi/soft-n-libs/library-release-history/2016-0#SL16b**

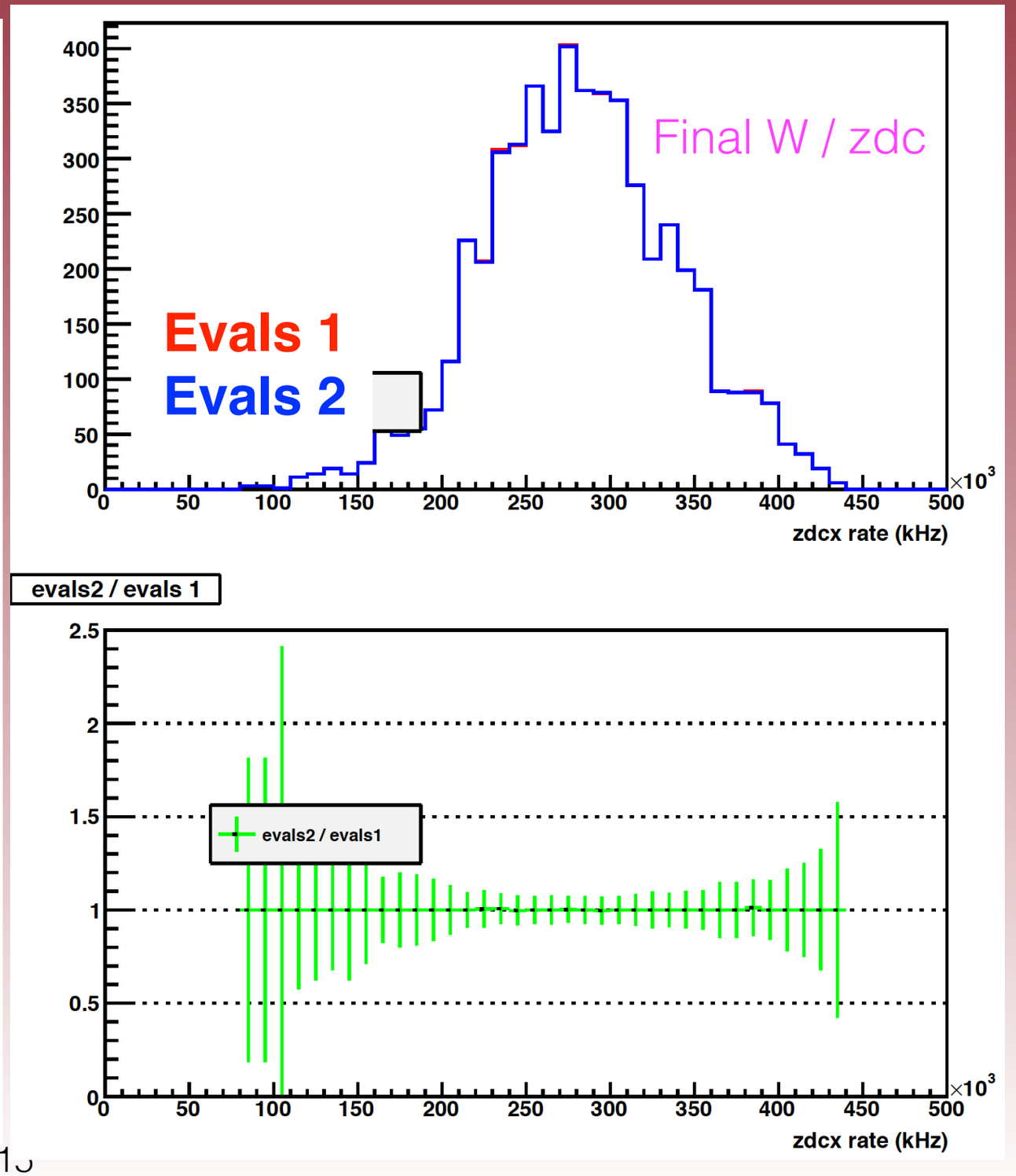
Events Counts





Final W, Final W ZDC





Sammry

Evals 1 vs p14ia

Apple- to -Apple comparison

Devika Gunarathne

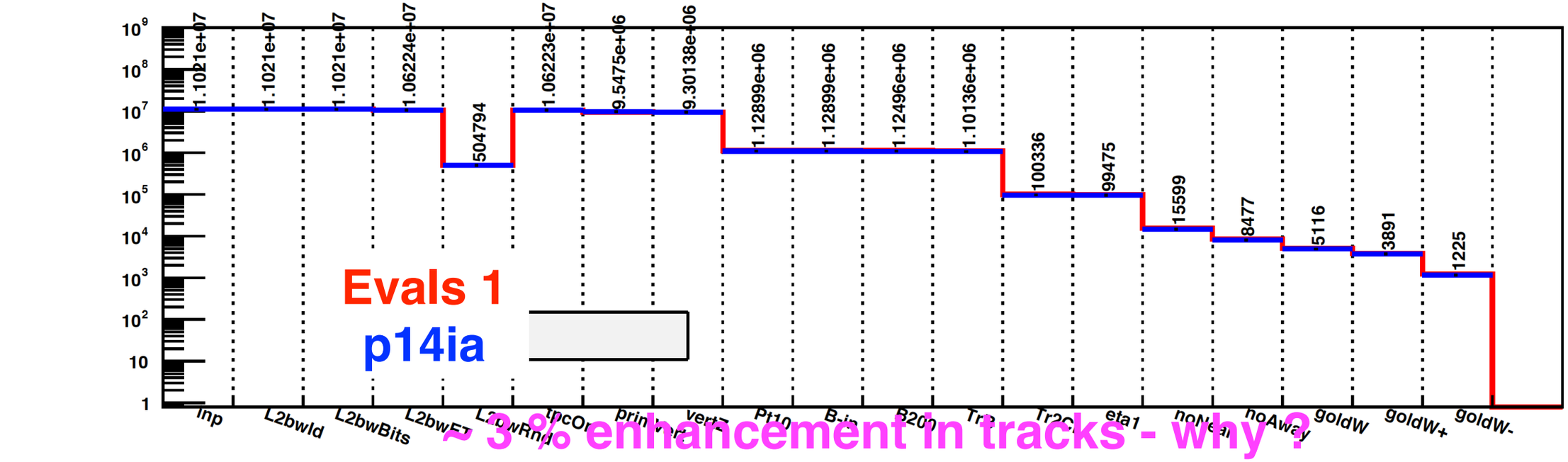
04-07-2016

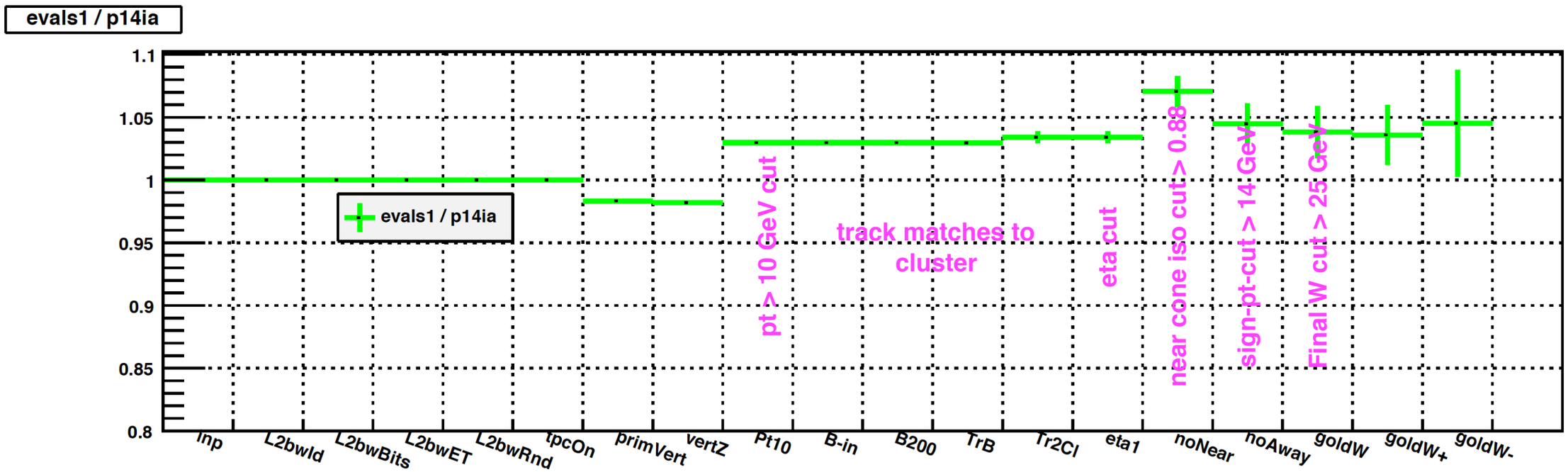
Details / Notes

Production	Production Library [also W-code compiled	Tracking	vertex finding	BEMC-gains	# of runs used in the comparison	# of events
P14ia [official run 13 - P1 (day 76-128)	SL14ia [SL14g]	Sti	PPV_W	run 12 - 200 GeV	885	11.021 M
“evals1”	SL16b	Sti	PPV_W	run 12 200 GeV	885	11.021 M

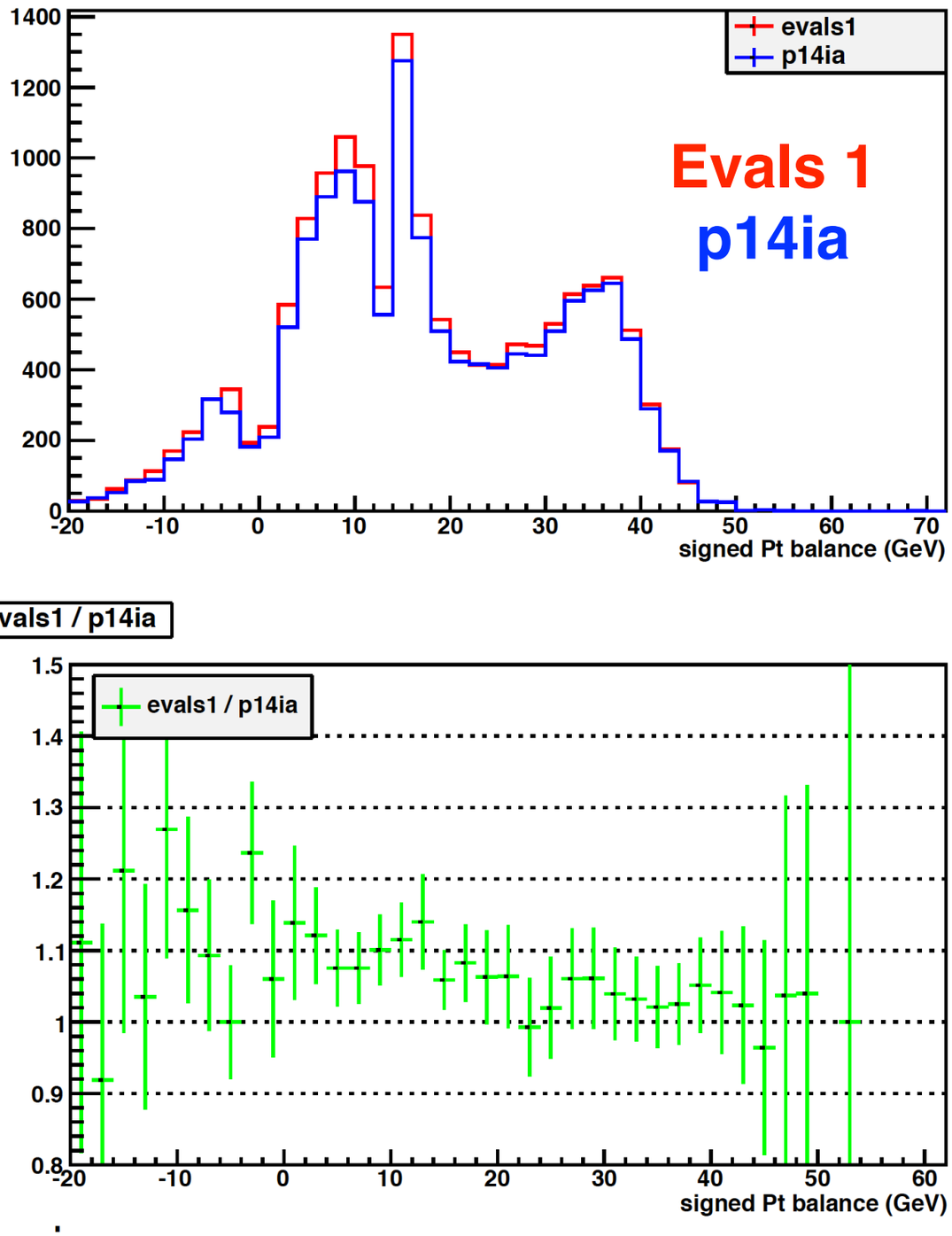
- **All the runs which were used for the comparison compared for # events processed. Runs which processed exactly the same # of events were chosen.**
- **I have compiled W code for P14ia using SL14g library which is not the production library. The main difference between SL14g compared to SL14a is “modifications for PXL & IST Sti geometry code” . [i don’t think this would make any affect, but I will reproduce p14ia with SL14a] ,**
- **SL16b - https://drupal.star.bnl.gov/STAR/comp/sofi/soft-n-libs/library-release-history/2016-0#SL16b**

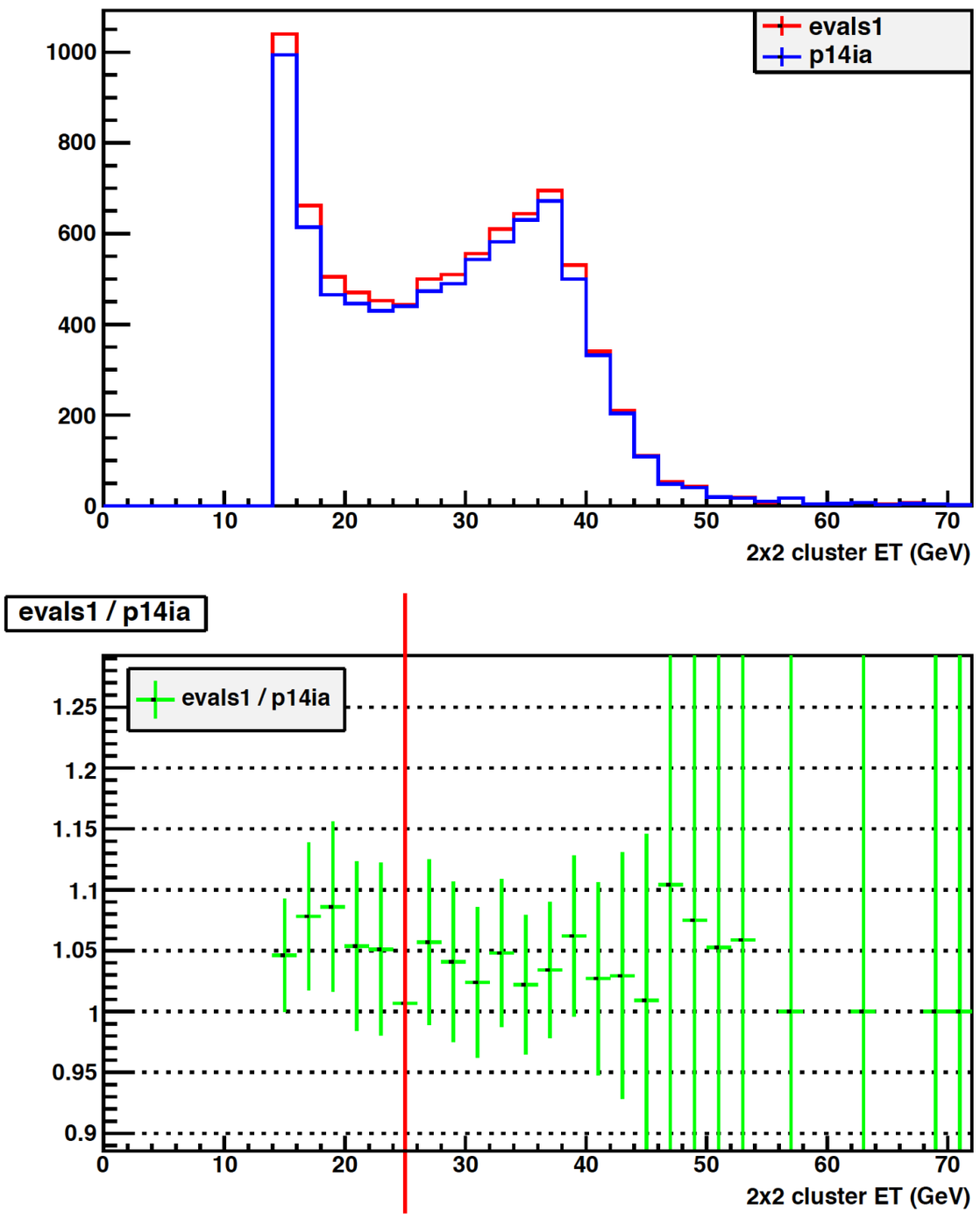
Events Counts



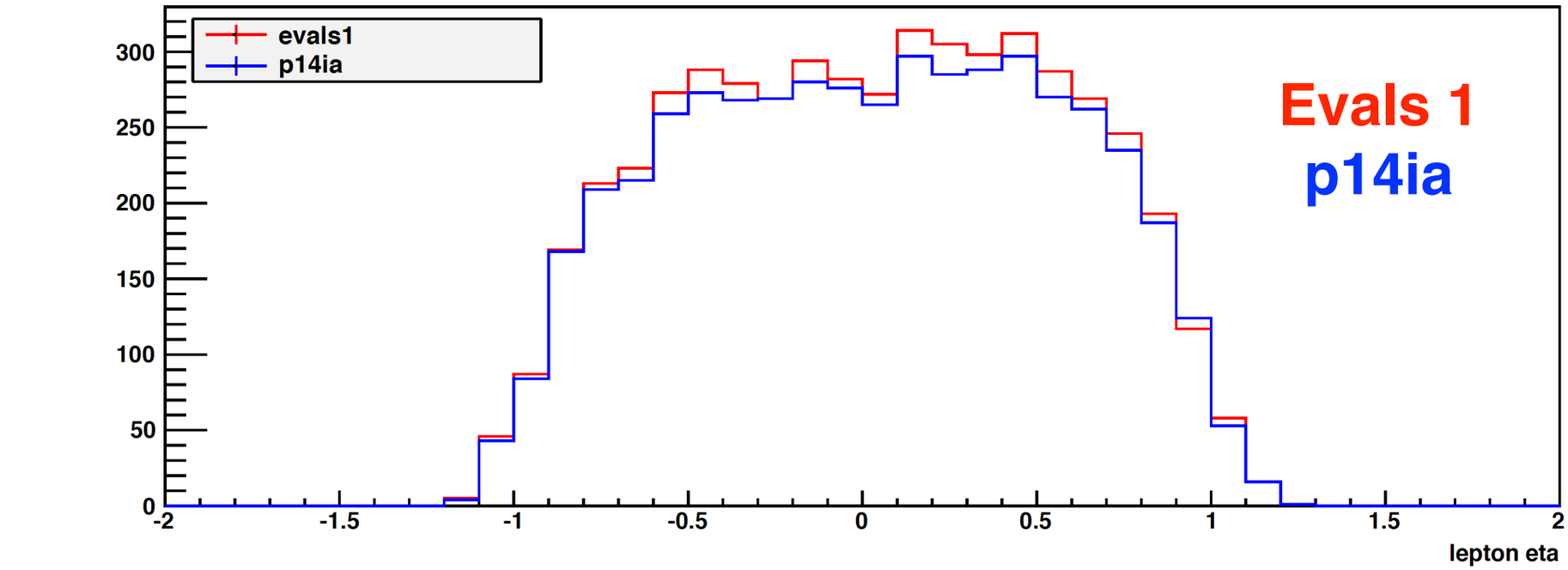


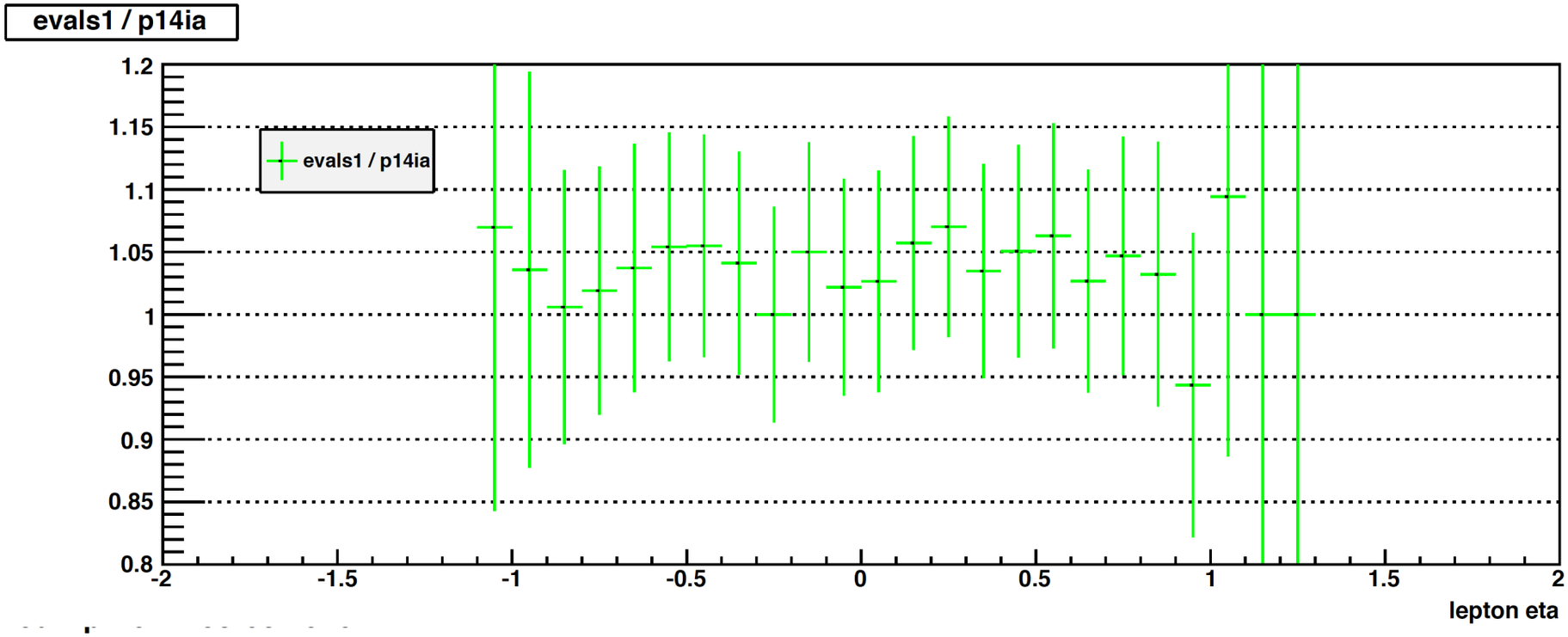
Final W


evals1
p14ia
Evals 1
p14ia
signed Pt balance (GeV)
evals1 / p14ia
evals1 / p14ia
signed Pt balance (GeV)

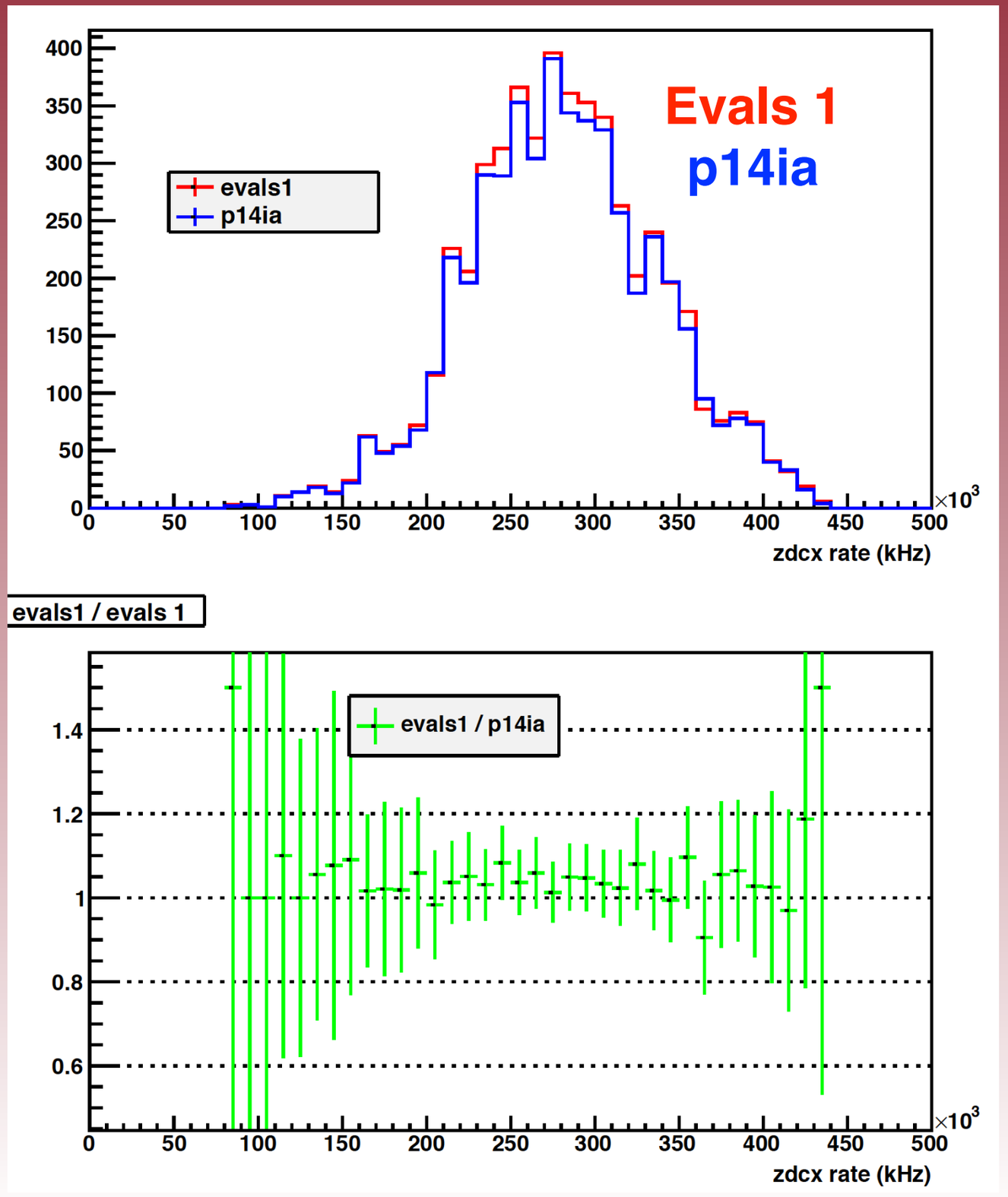

evals1
p14ia
2x2 cluster ET (GeV)
evals1 / p14ia
evals1 / p14ia
2x2 cluster ET (GeV)

Final W Eta

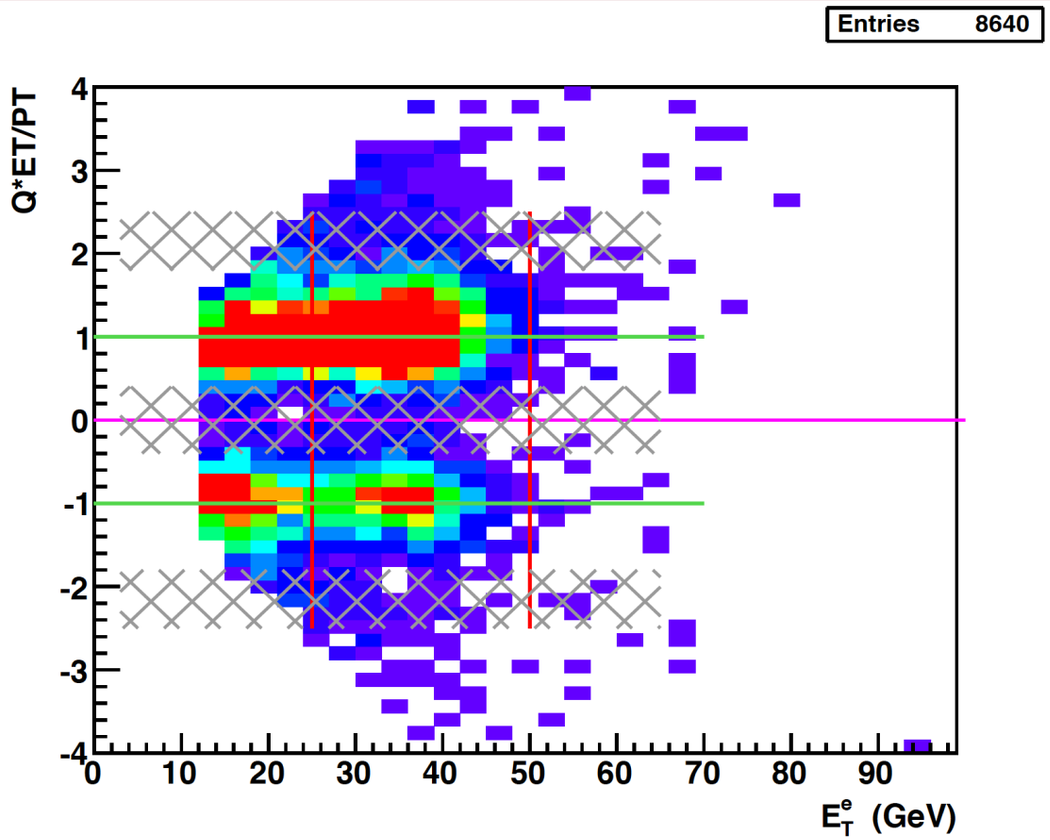

evals1
p14ia
Evals 1
p14ia
300
250
200
150
100
50
0
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
lepton eta

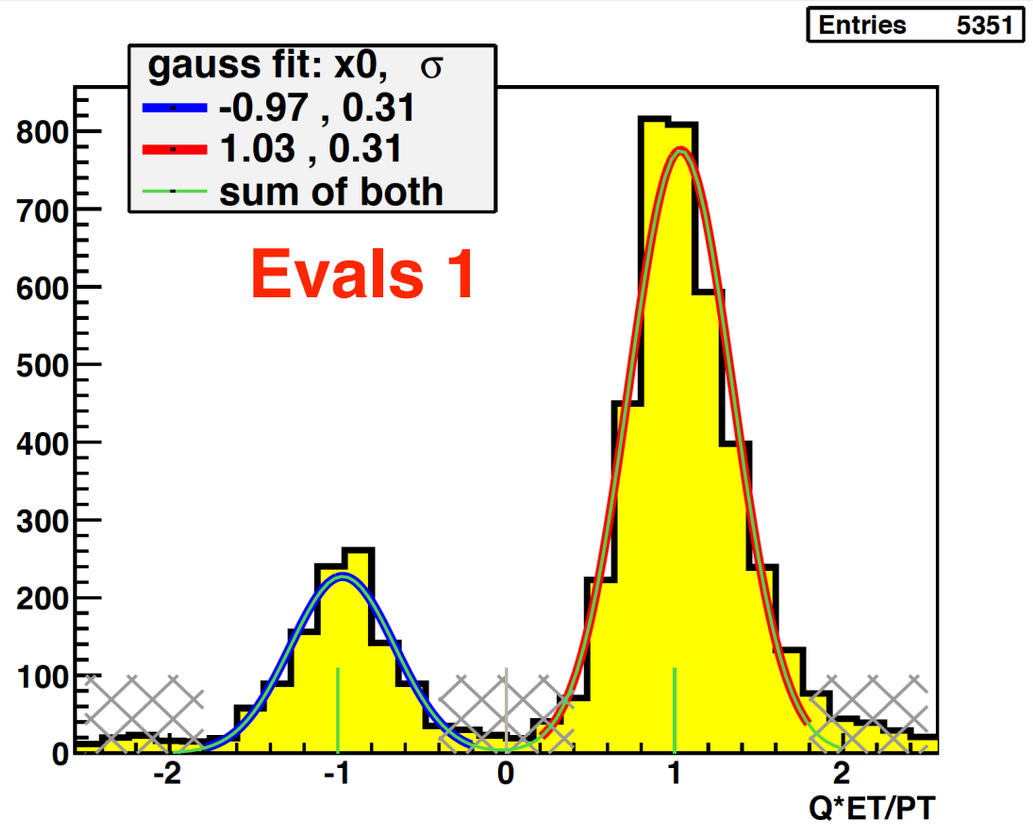

evals1 / p14ia
evals1 / p14ia
1.2
1.15
1.1
1.05
1
0.95
0.9
0.85
0.8
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
lepton eta

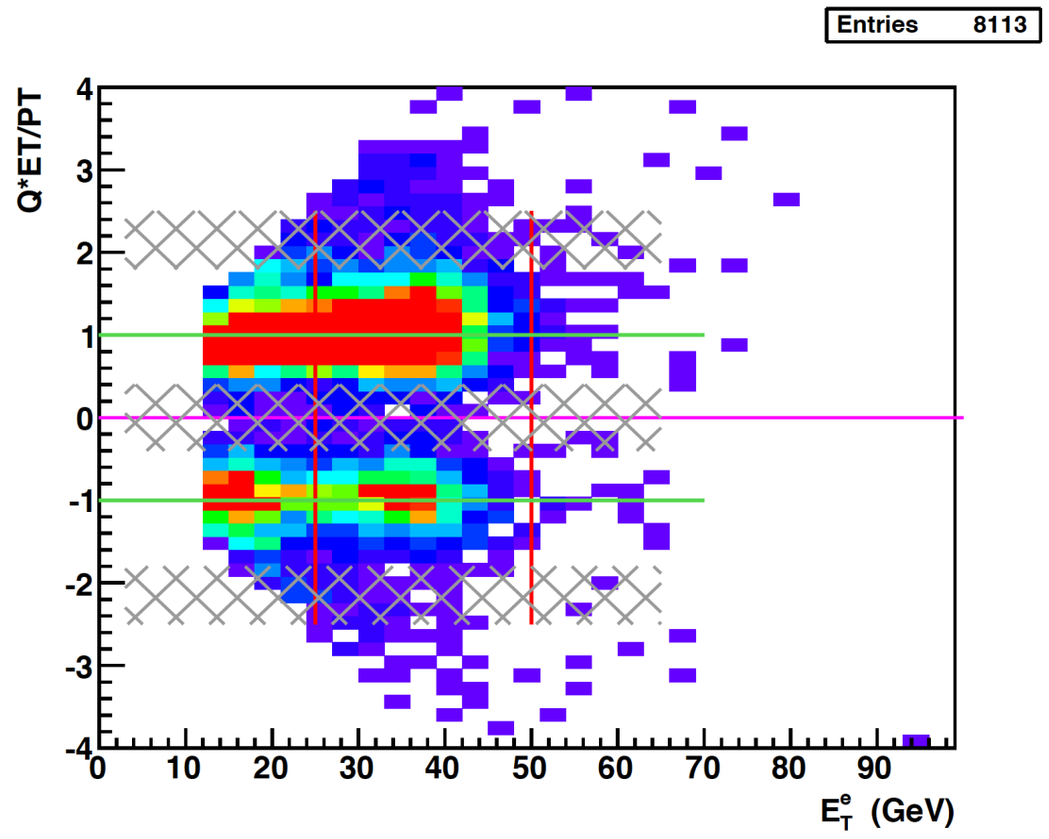
Final W / ZDC

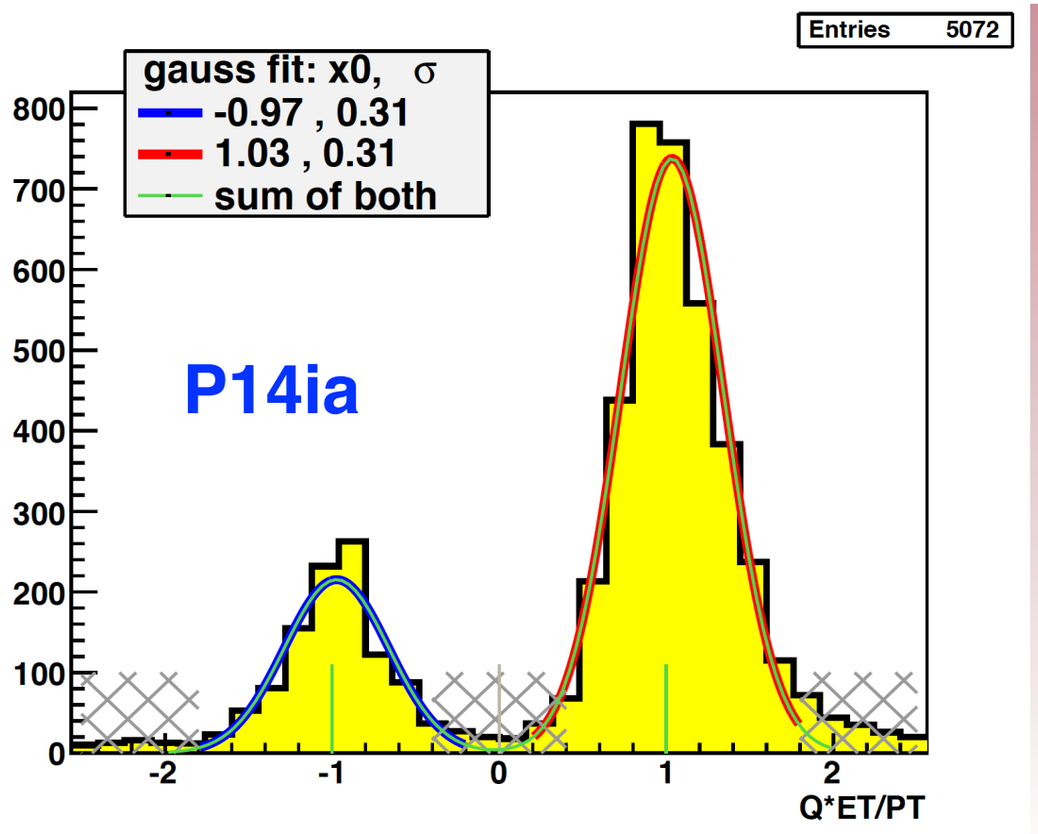

evals1
p14ia
Evals 1
p14ia
zdcx rate (kHz)
evals1 / evals 1
evals1 / p14ia
zdcx rate (kHz)

W Charge Separation

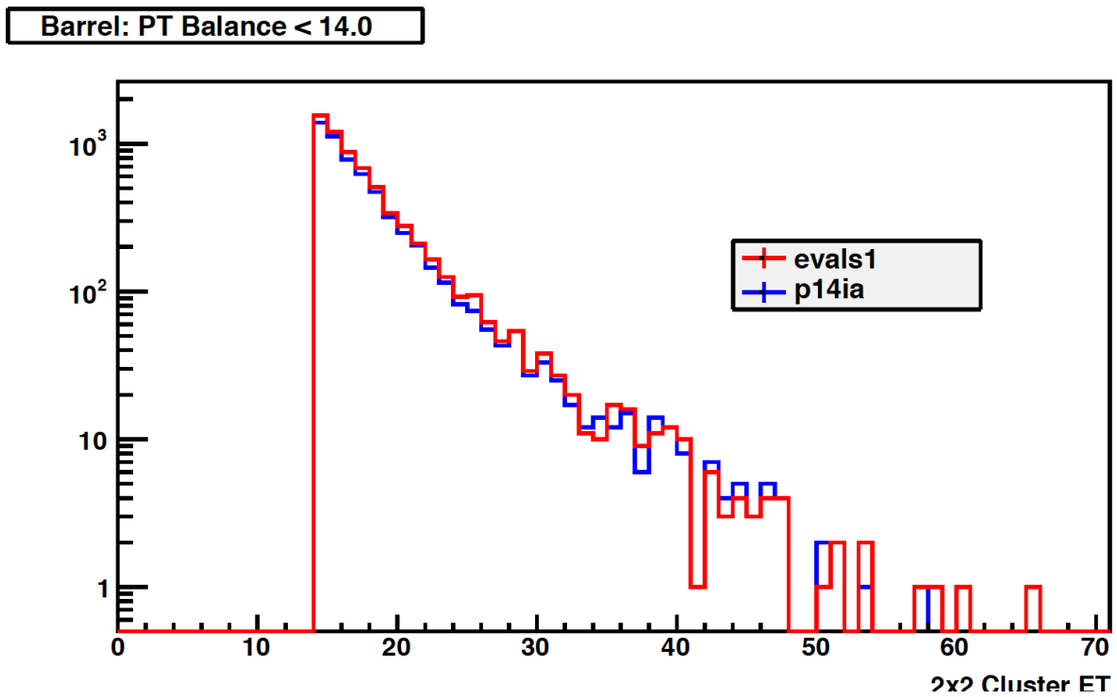


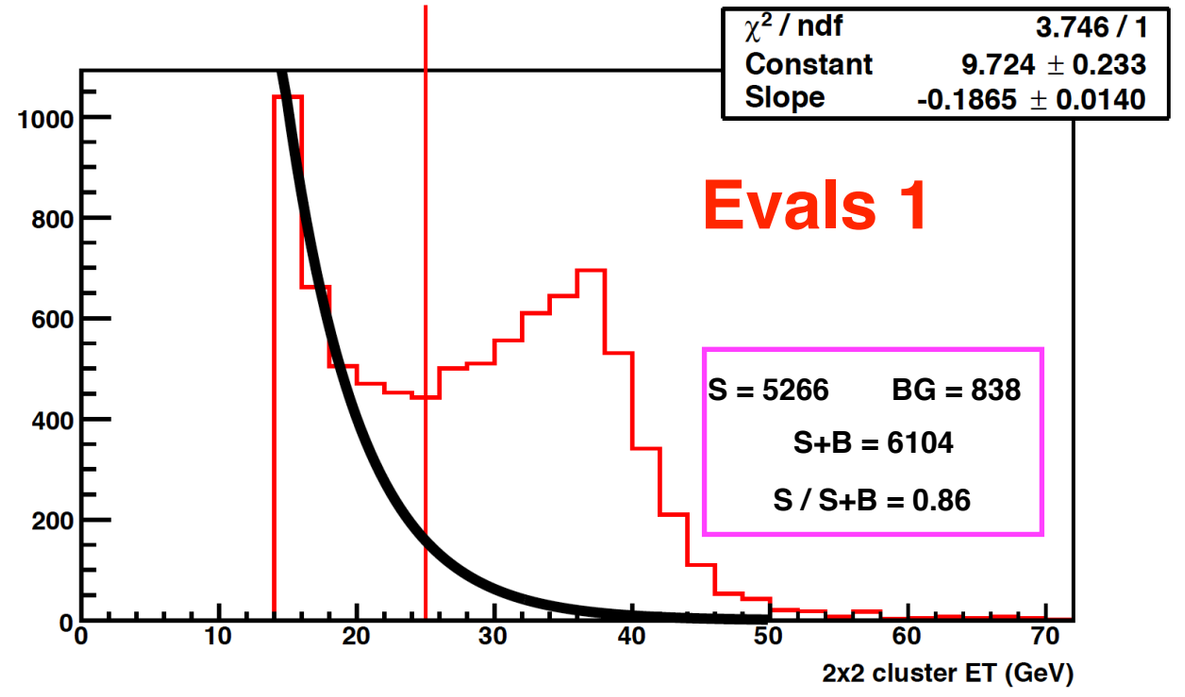


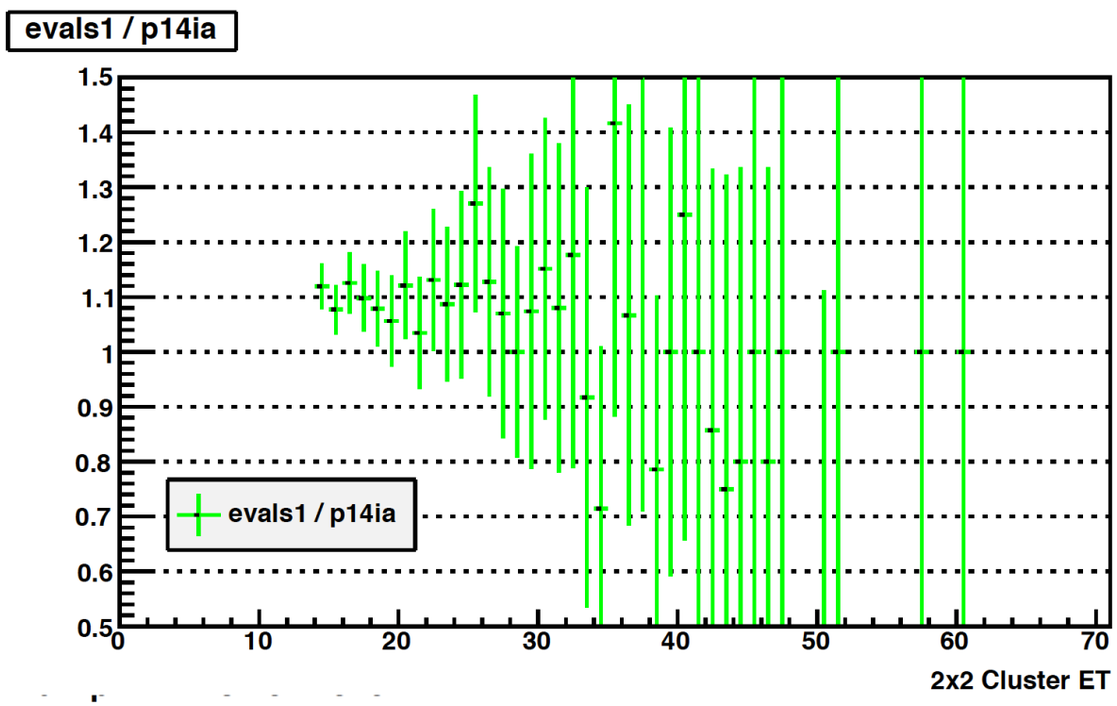


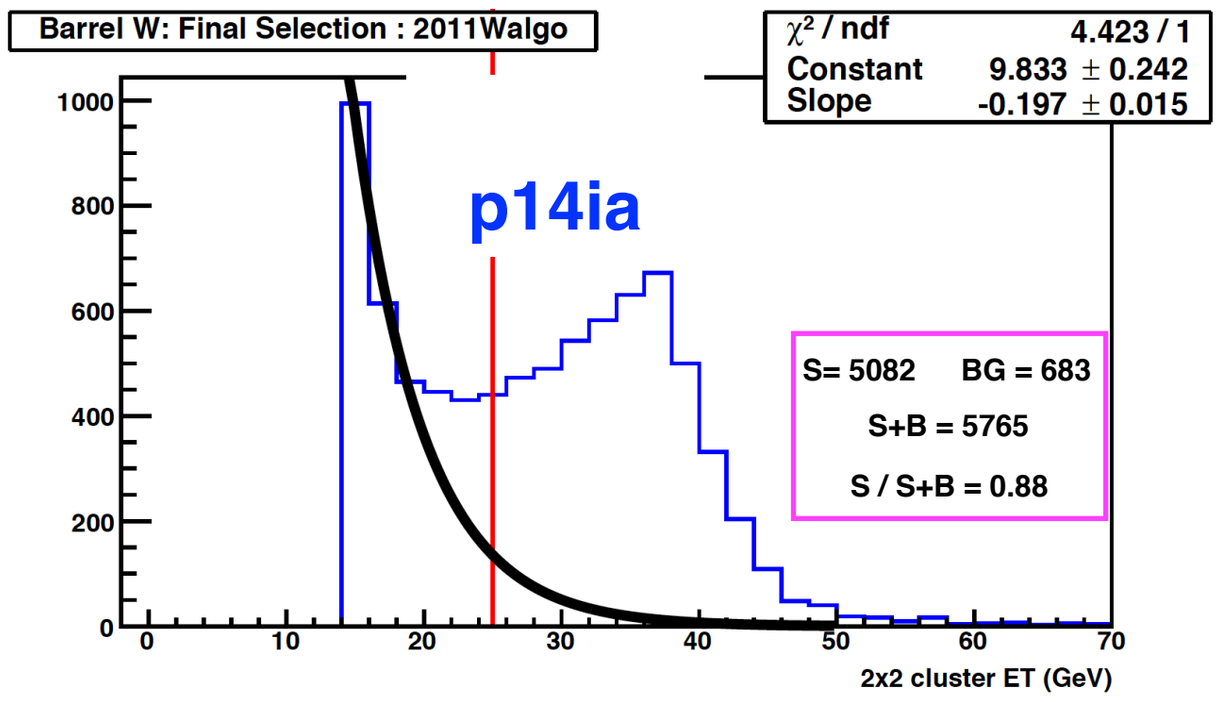


QCD BG


Barrel: PT Balance < 14.0
evals1
p14ia
2x2 Cluster ET


χ^2 / ndf 3.746 / 1
Constant 9.724 ± 0.233
Slope -0.1865 ± 0.0140
Evals 1
S = 5266 BG = 838
S+B = 6104
S / S+B = 0.86
2x2 cluster ET (GeV)


evals1 / p14ia
evals1 / p14ia
2x2 Cluster ET


Barrel W: Final Selection : 2011Walgo
χ^2 / ndf 4.423 / 1
Constant 9.833 ± 0.242
Slope -0.197 ± 0.015
p14ia
S= 5082 BG = 683
S+B = 5765
S / S+B = 0.88
2x2 cluster ET (GeV)

Summary

Yuri's-P2 vs P14ig [run 13 -official -P2]

apple- to -apple comparison

Devika Gunarathne

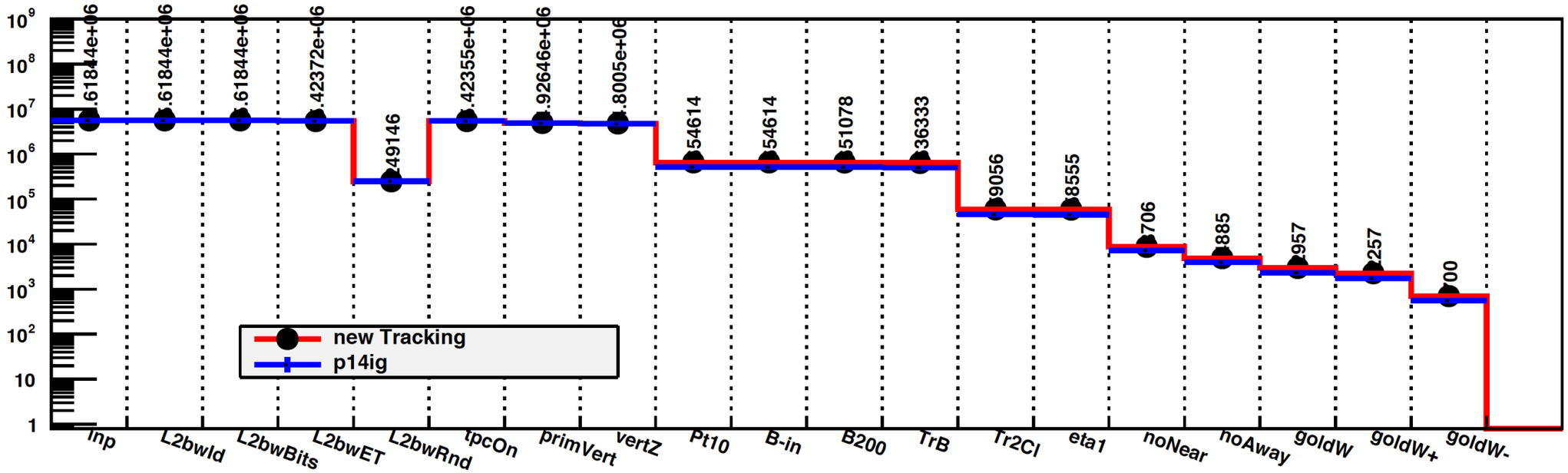
04-07-2016

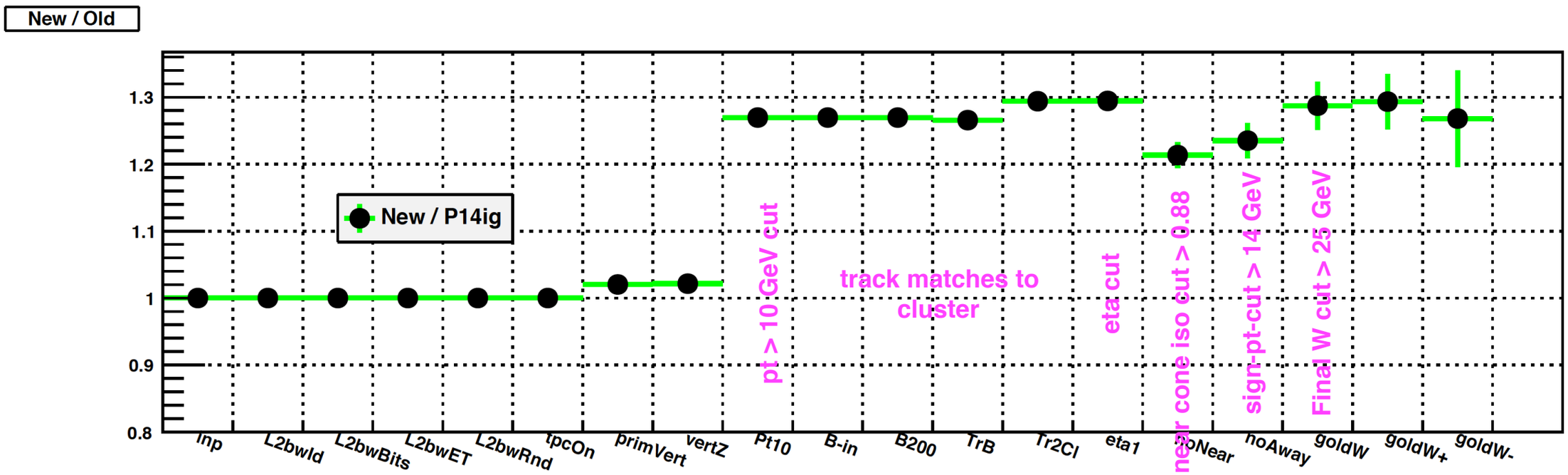
Details / Notes

Production	Production Library [also W-code compiled library]	Tracking	vertex finding	BEMC-gains	# of runs used in the comparison	# of events
P14ig [official run 13 - P2 (day 129-161)	SL14ig	Sti	PPV_W	run 12 - 200 GeV	436	5618340
Yuri's - P2 (day 129-161)	DEV2/ TFG16a	StiCA [Yuri's code]	PPV_W	run 12 200 GeV	436	5618485

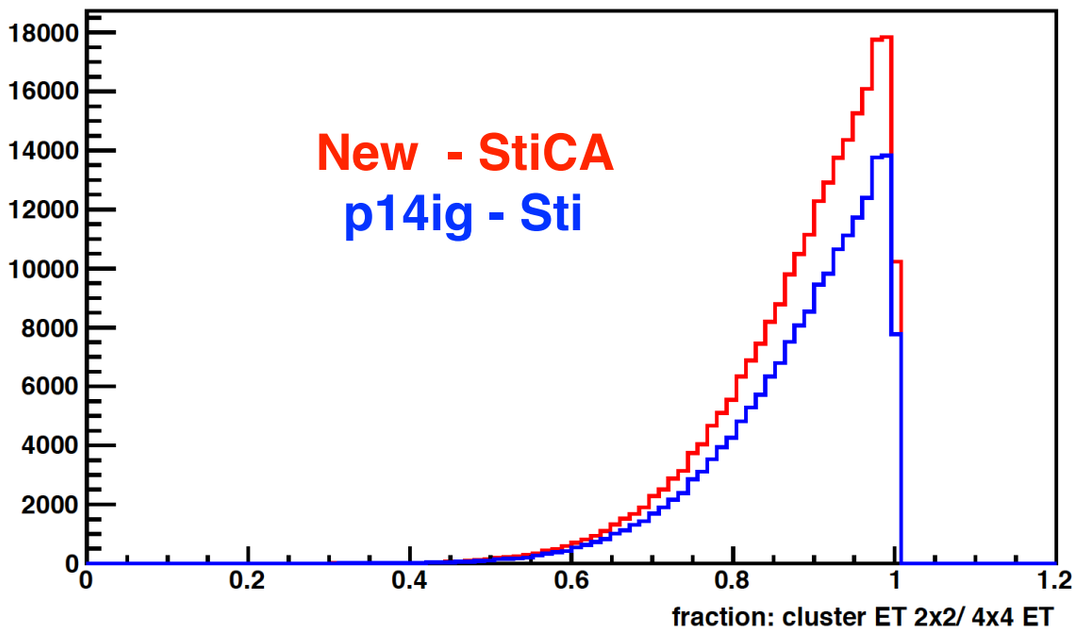
- **All the runs which were used for the comparison compared for # events processed. I chose runs which processed exactly same # of events or runs where events differ by 1 or 2 events. Yuri's production had ~ 100 runs with only 1 or 2 events higher. Since 1-2 events difference is negligible this can be considered as apple to apple.**

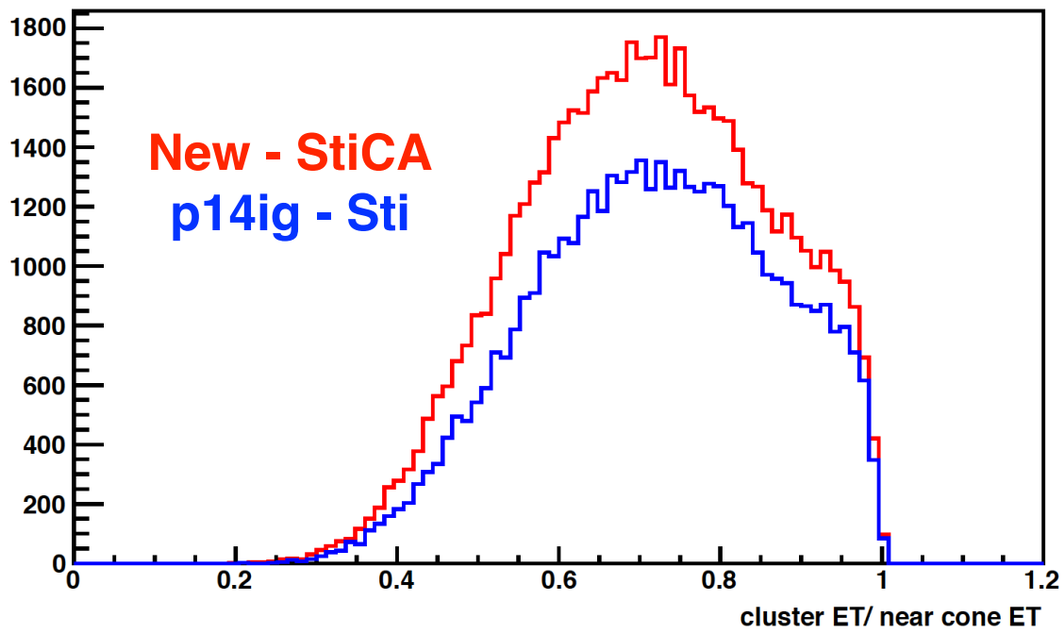
Events Counts

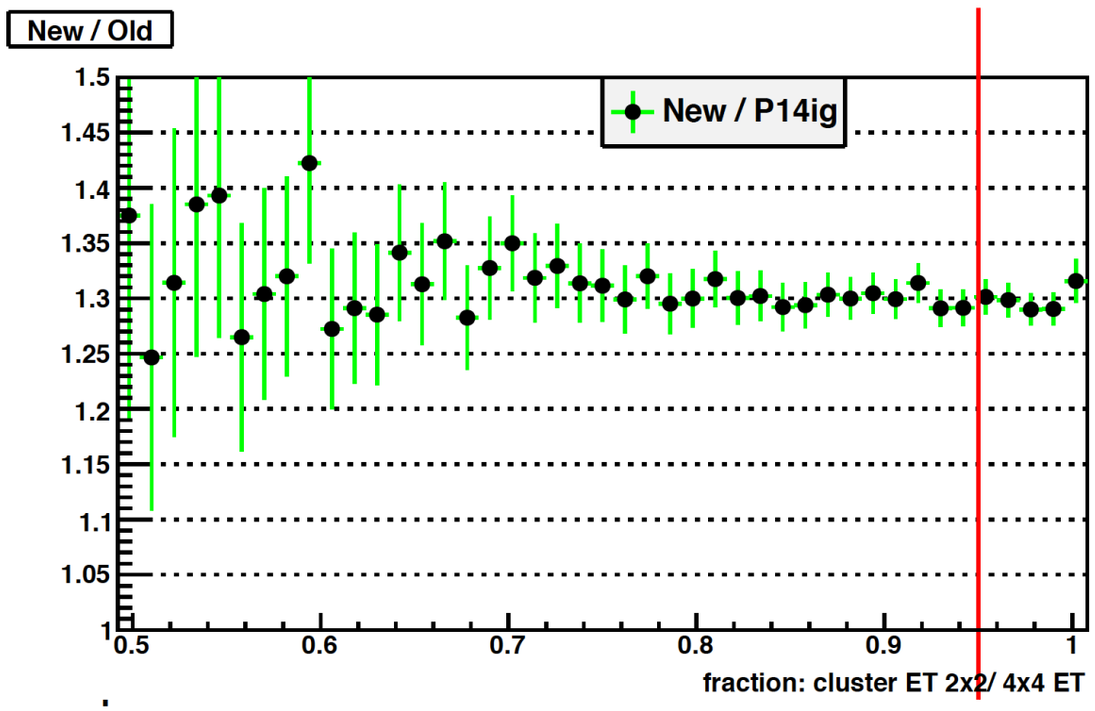


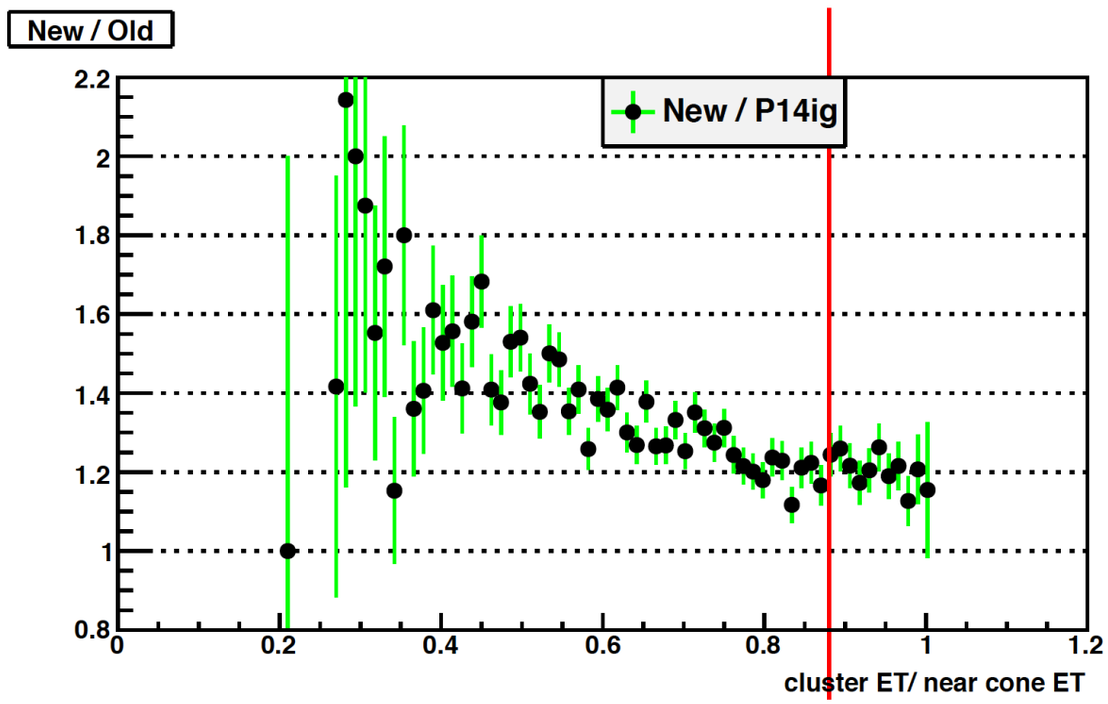


Isolation cuts

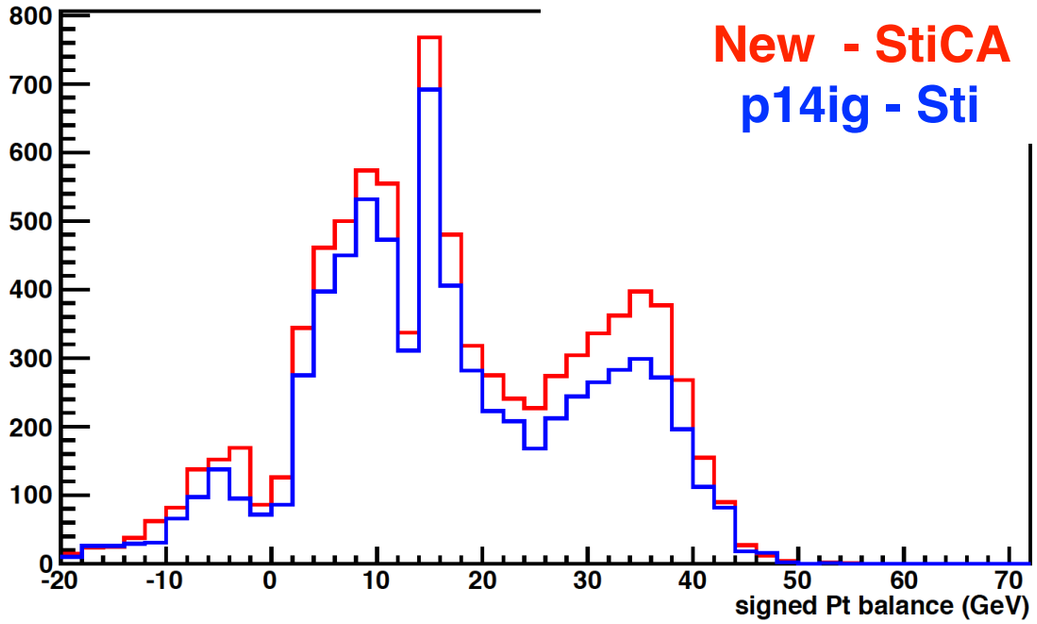


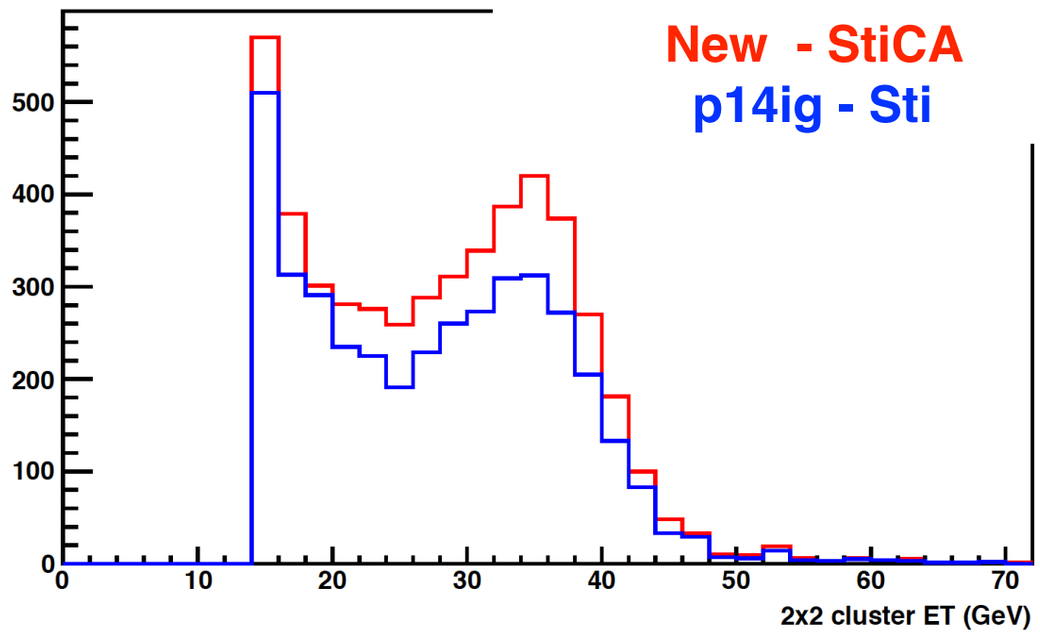


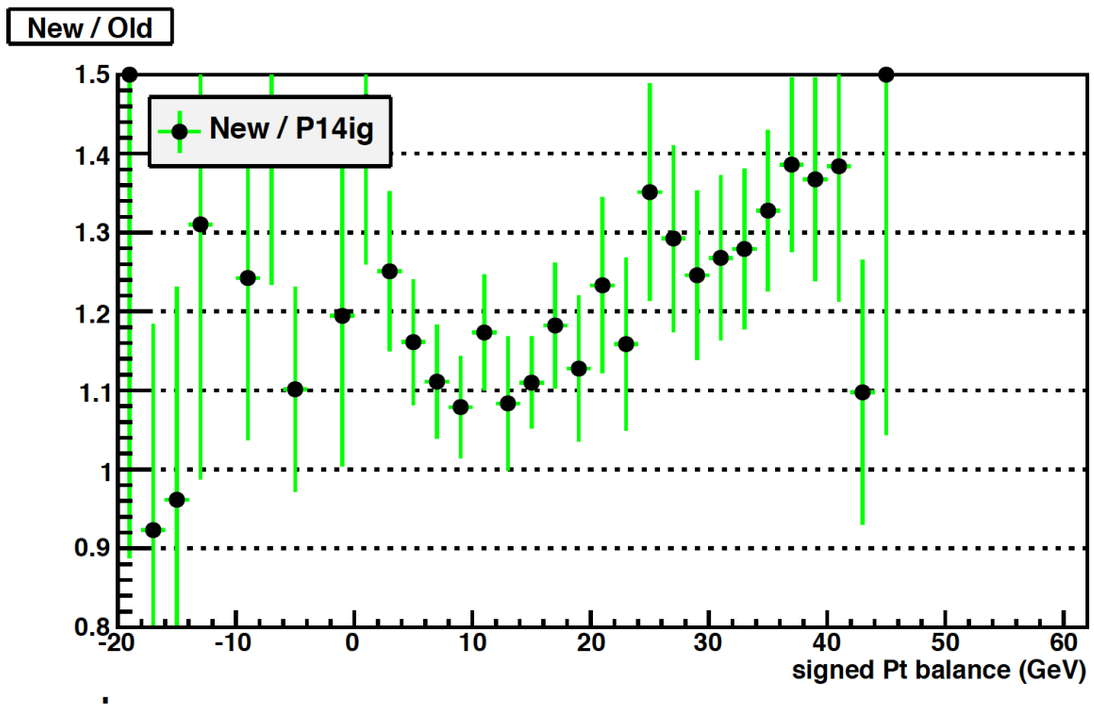


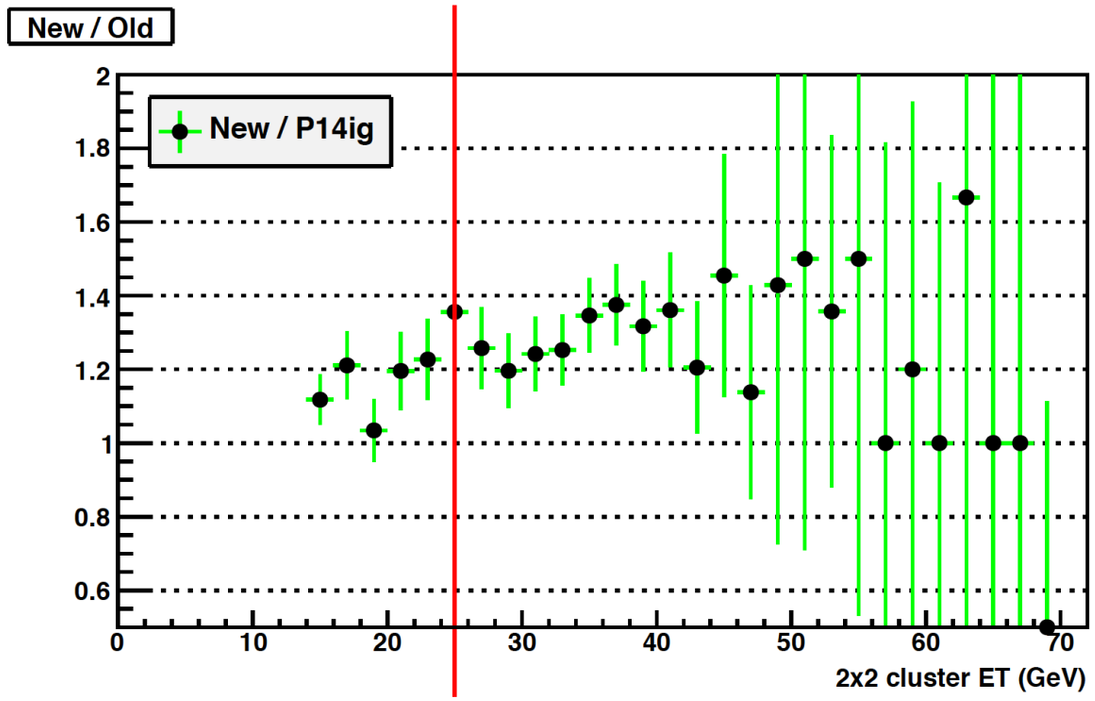


Sing Pt , Final W

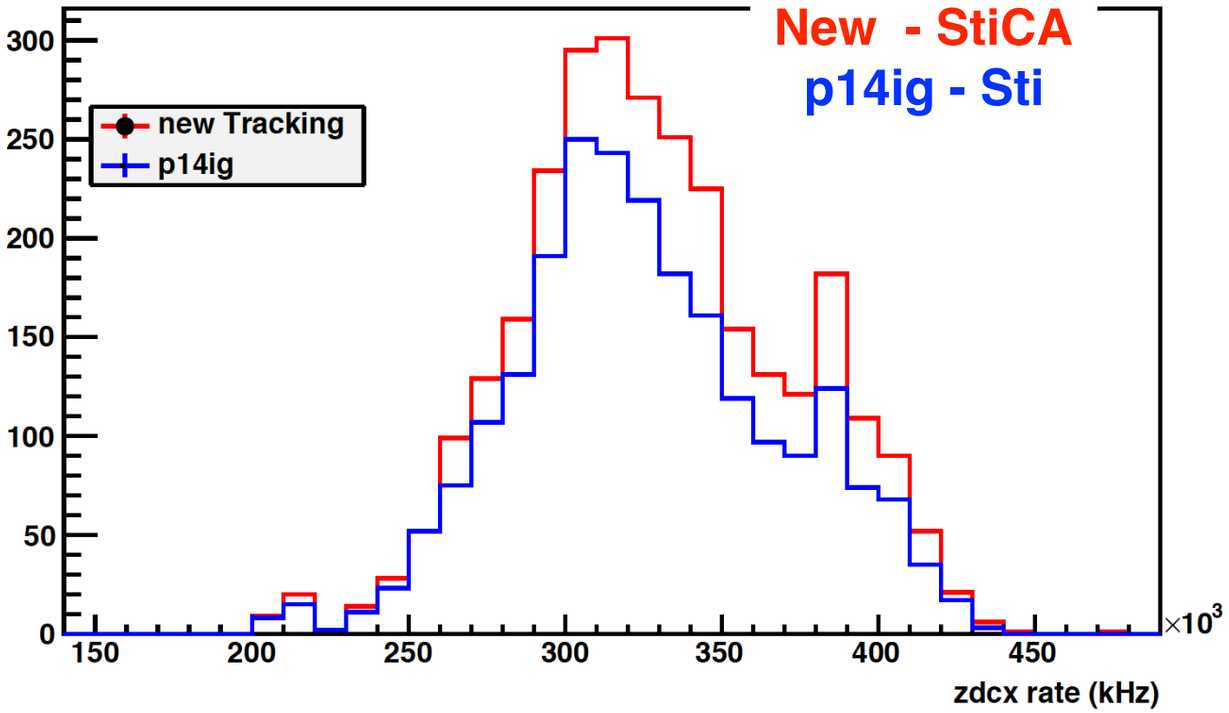


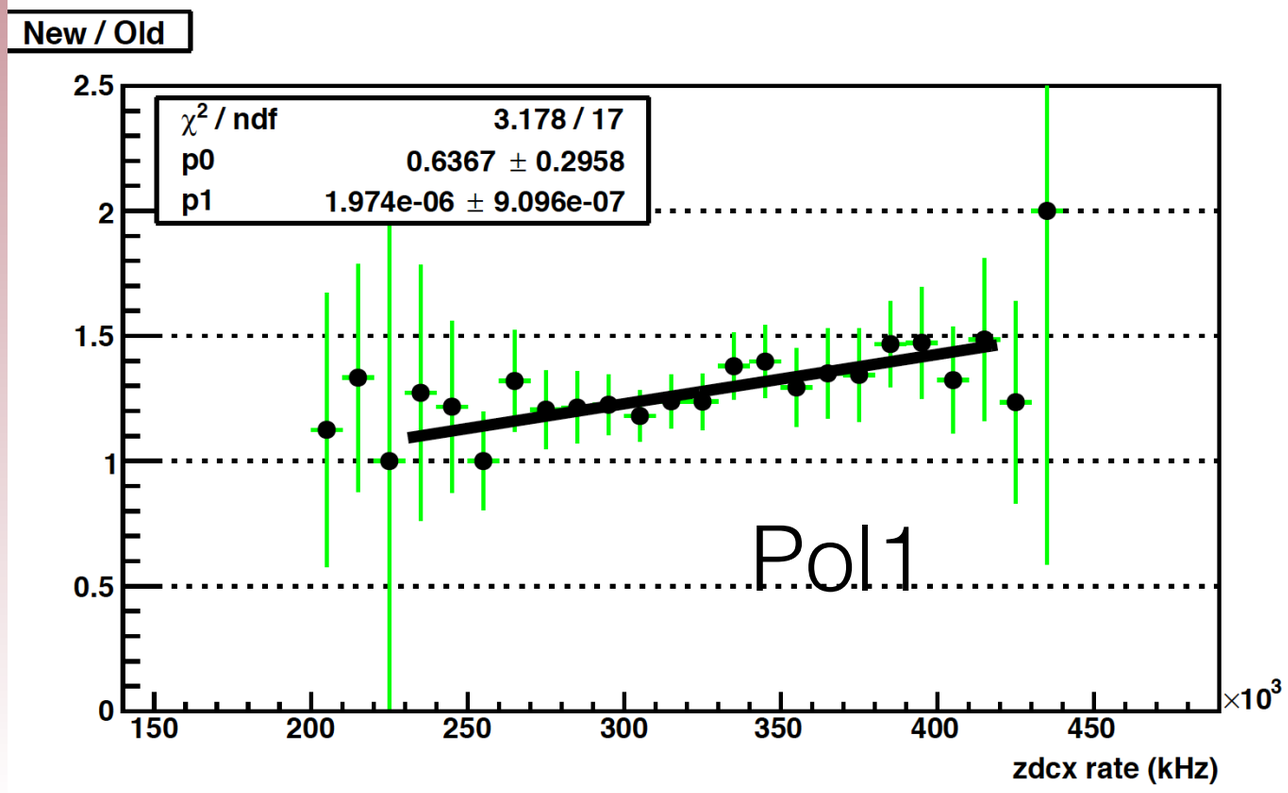


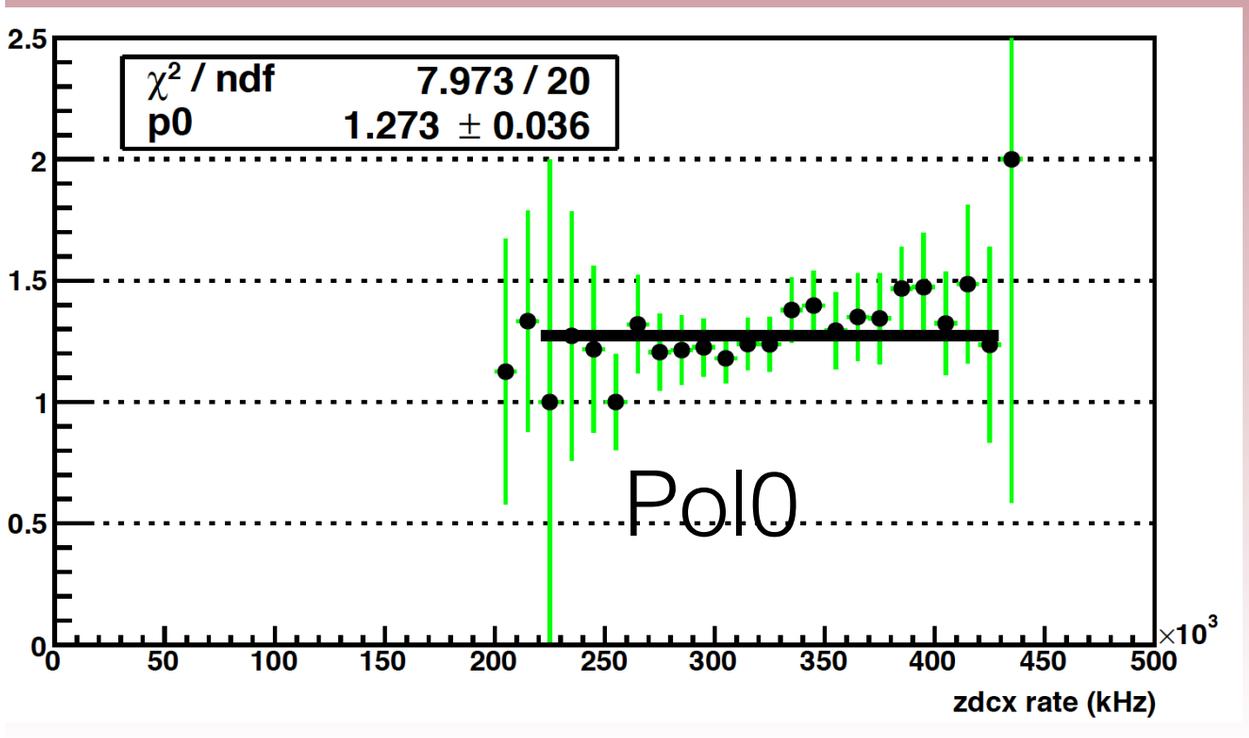




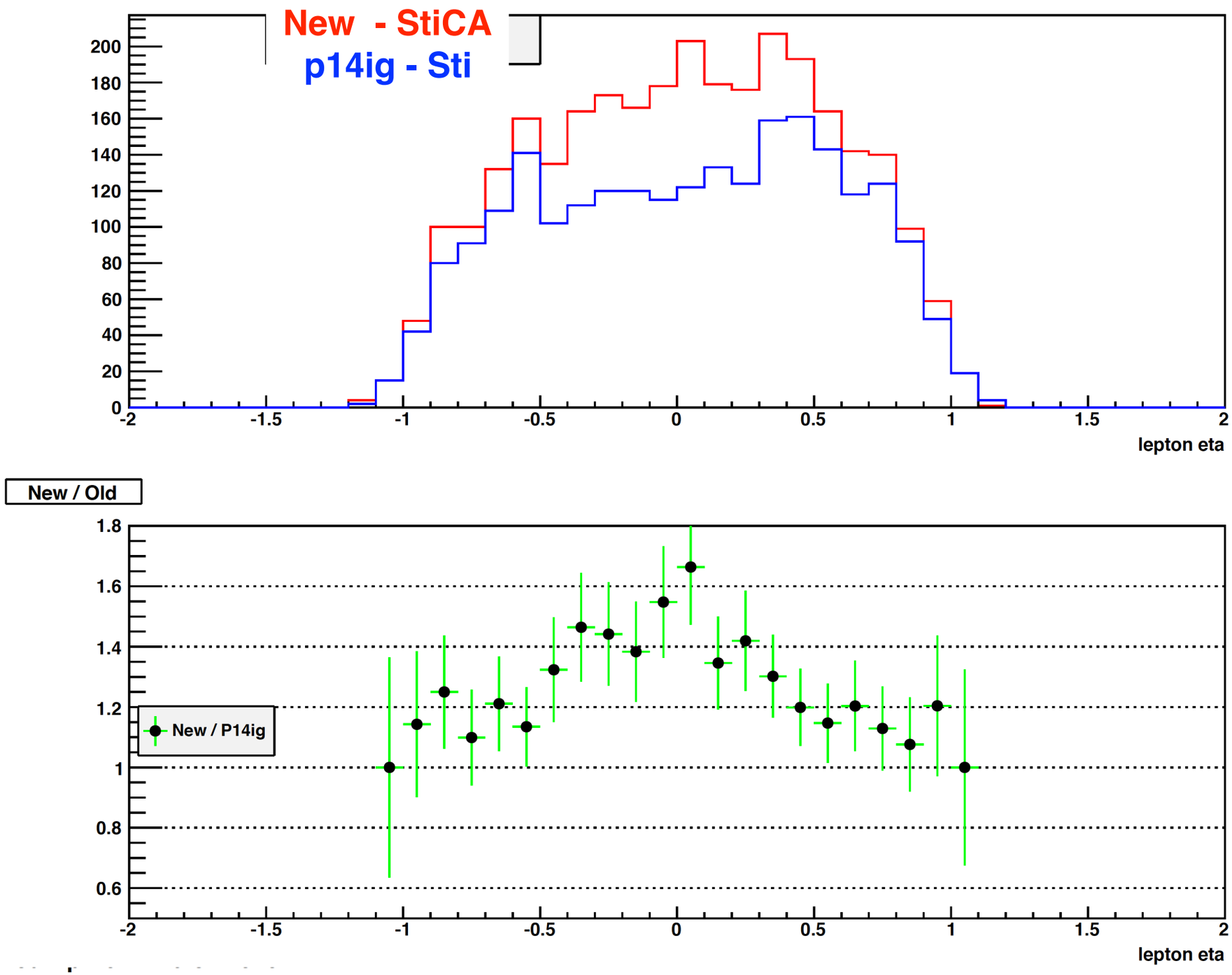
Final W per ZDC



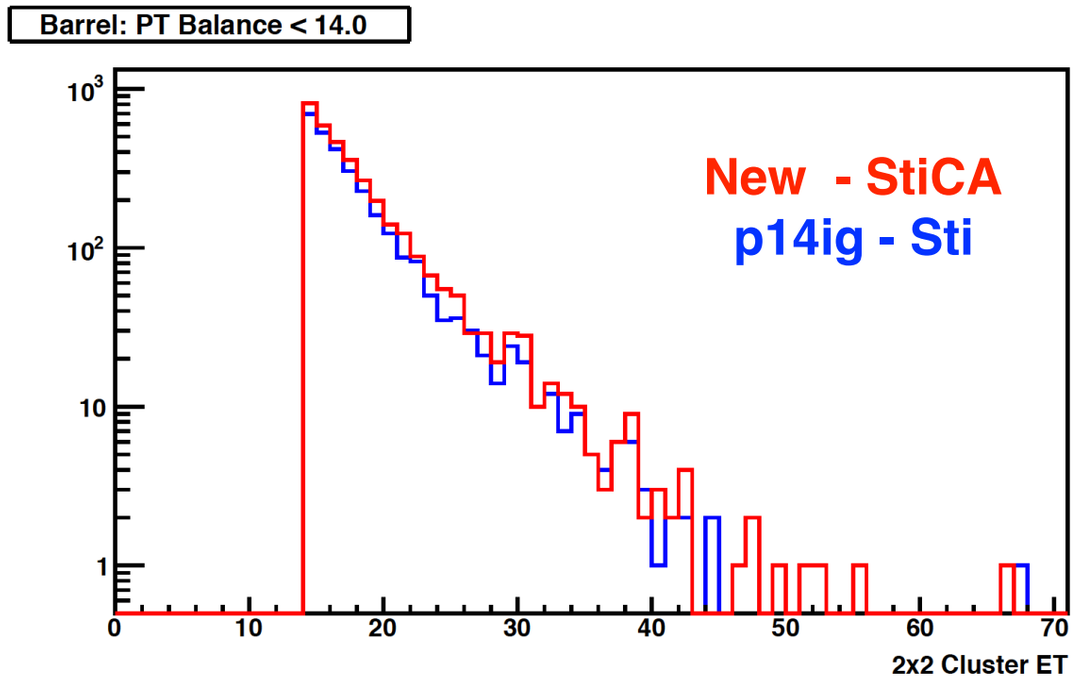


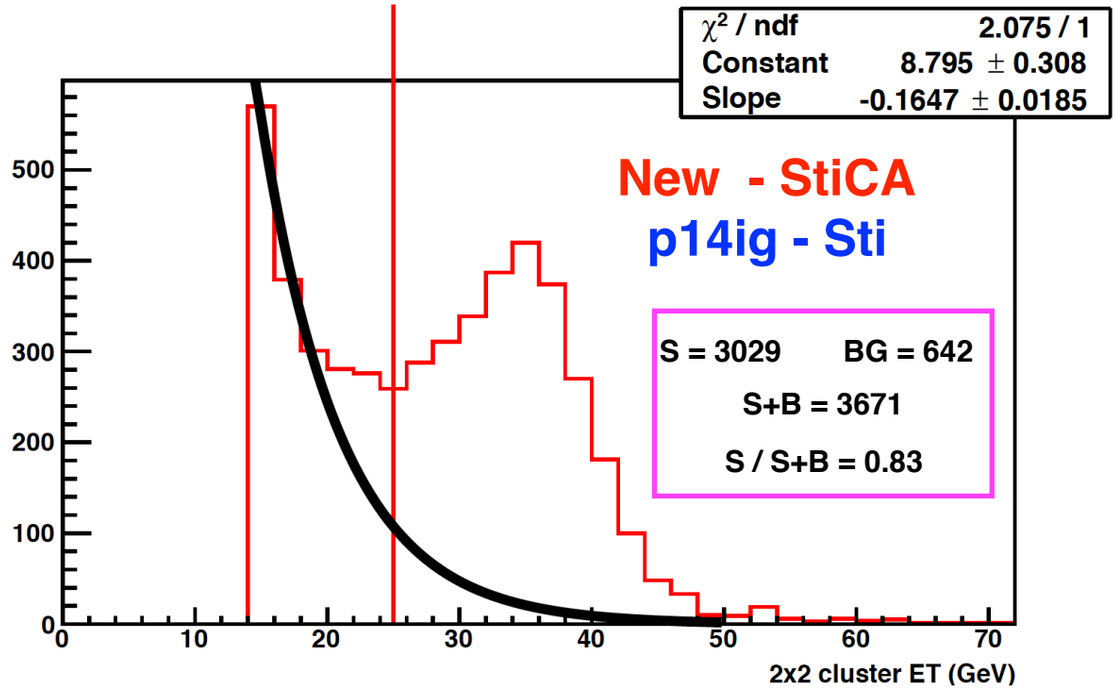


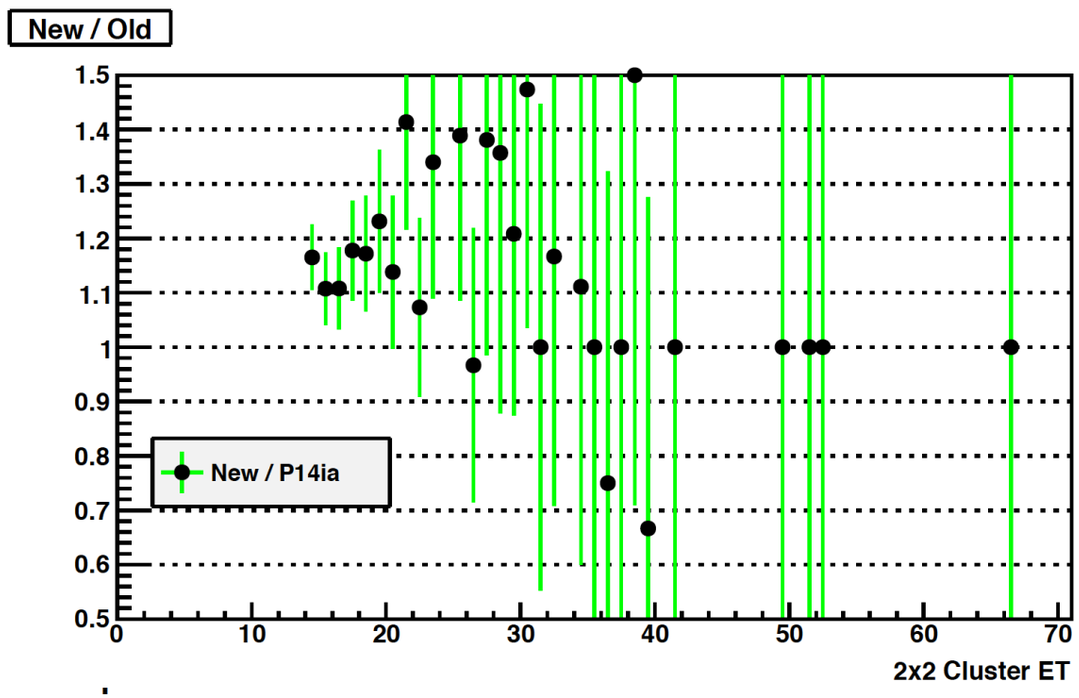
Final W Eta

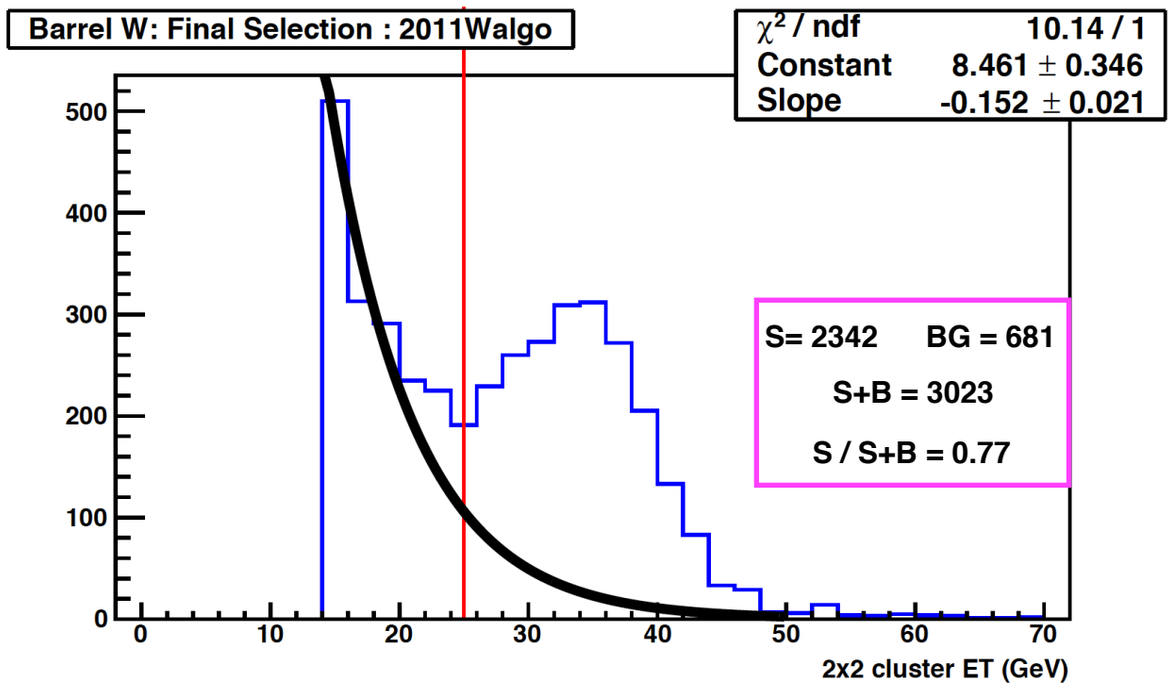


QCD BG

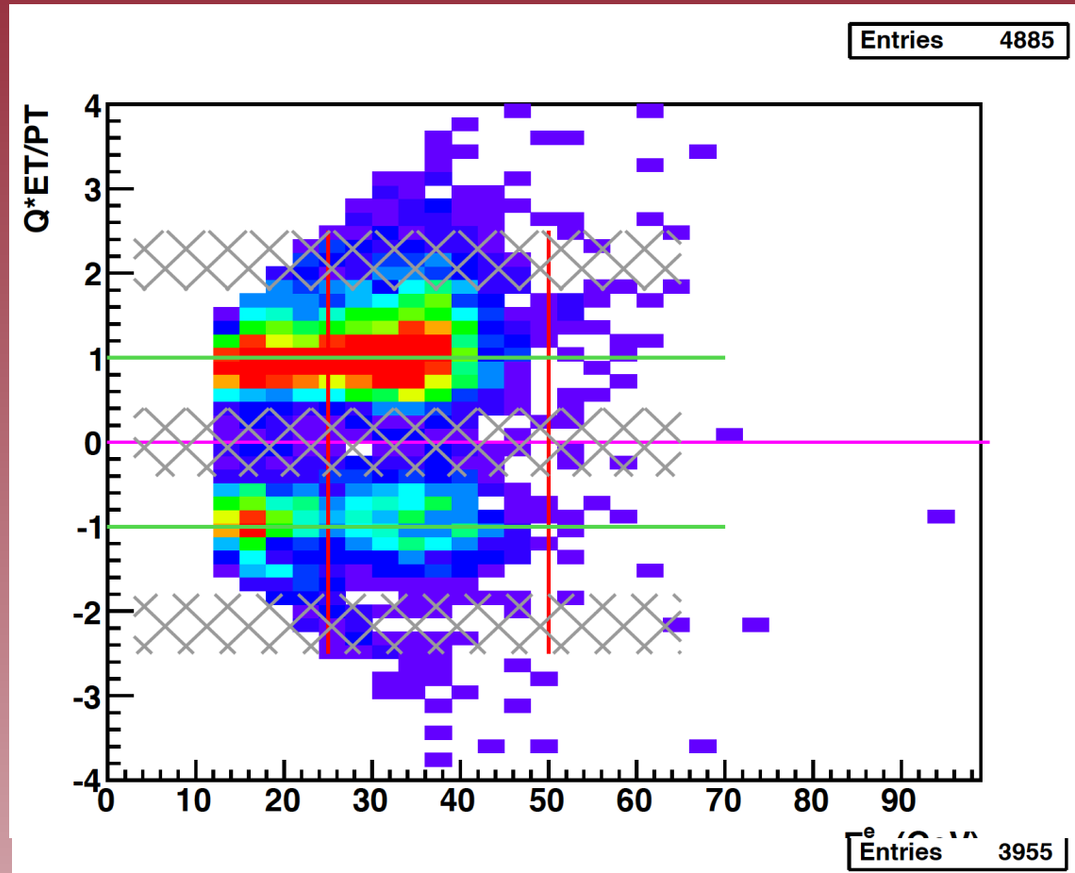

Barrel: PT Balance < 14.0
New - StiCA
p14ig - Sti
2x2 Cluster ET

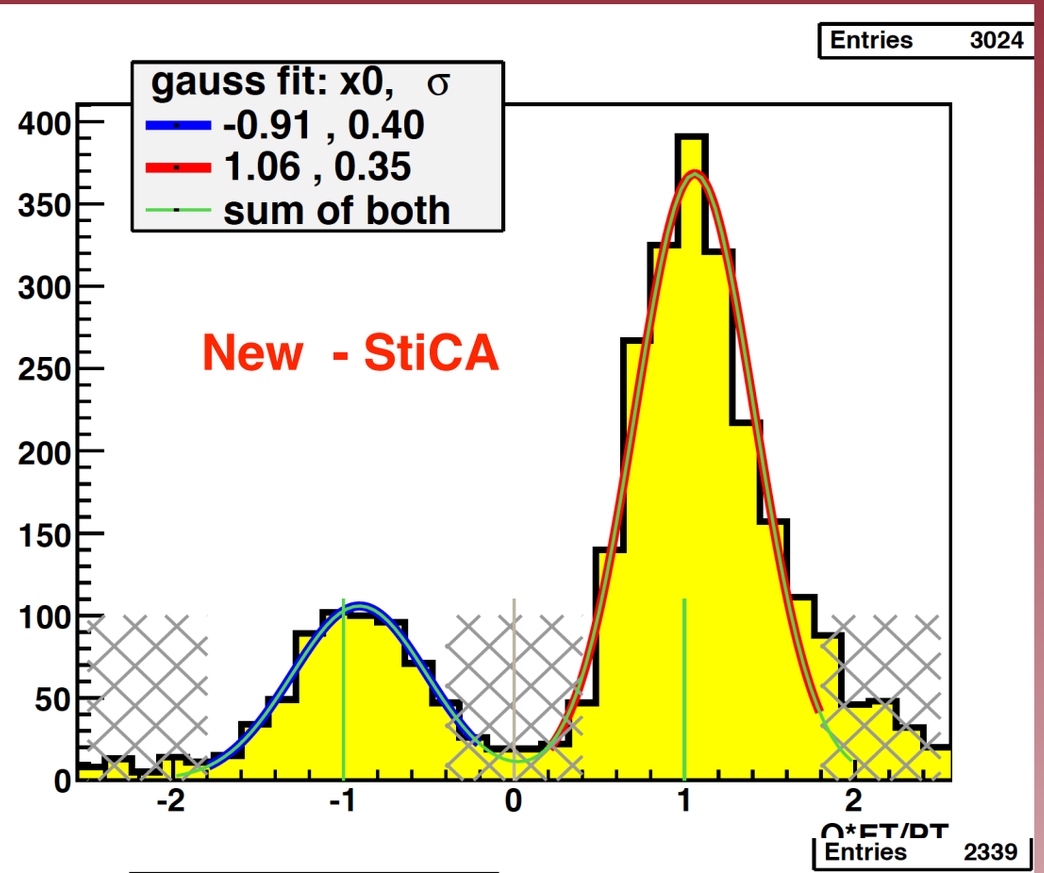

χ² / ndf 2.075 / 1
Constant 8.795 ± 0.308
Slope -0.1647 ± 0.0185
New - StiCA
p14ig - Sti
S = 3029 BG = 642
S+B = 3671
S / S+B = 0.83
2x2 cluster ET (GeV)

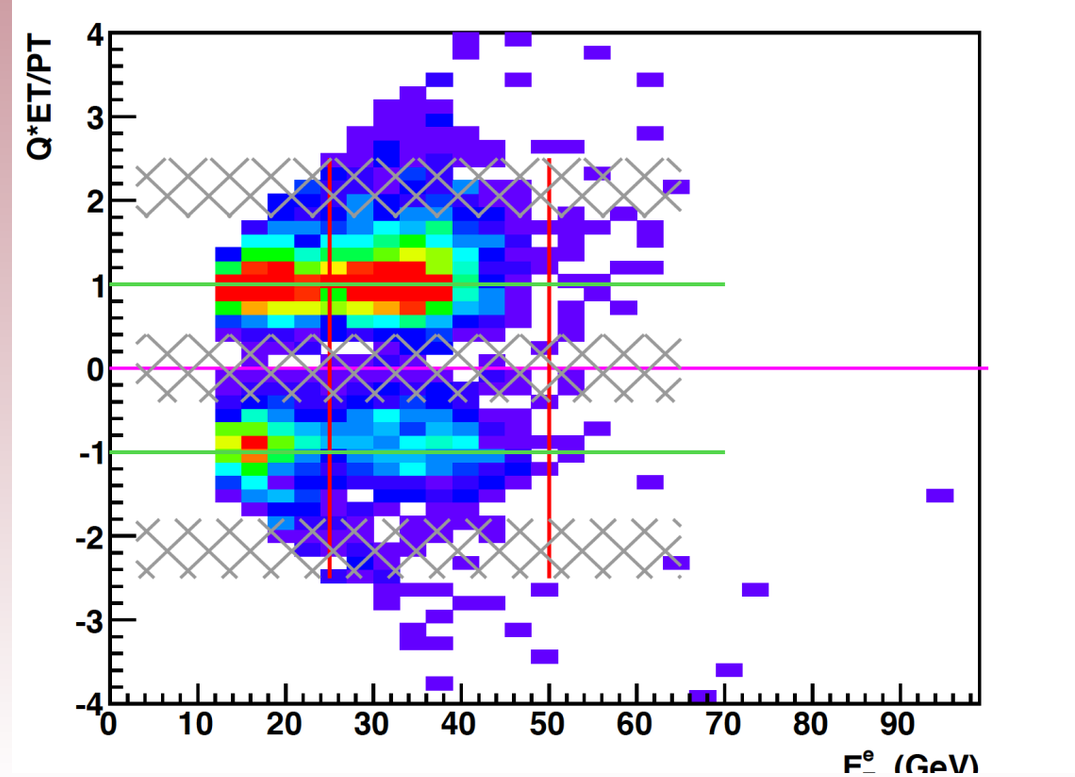

New / Old
New / P14ia
2x2 Cluster ET

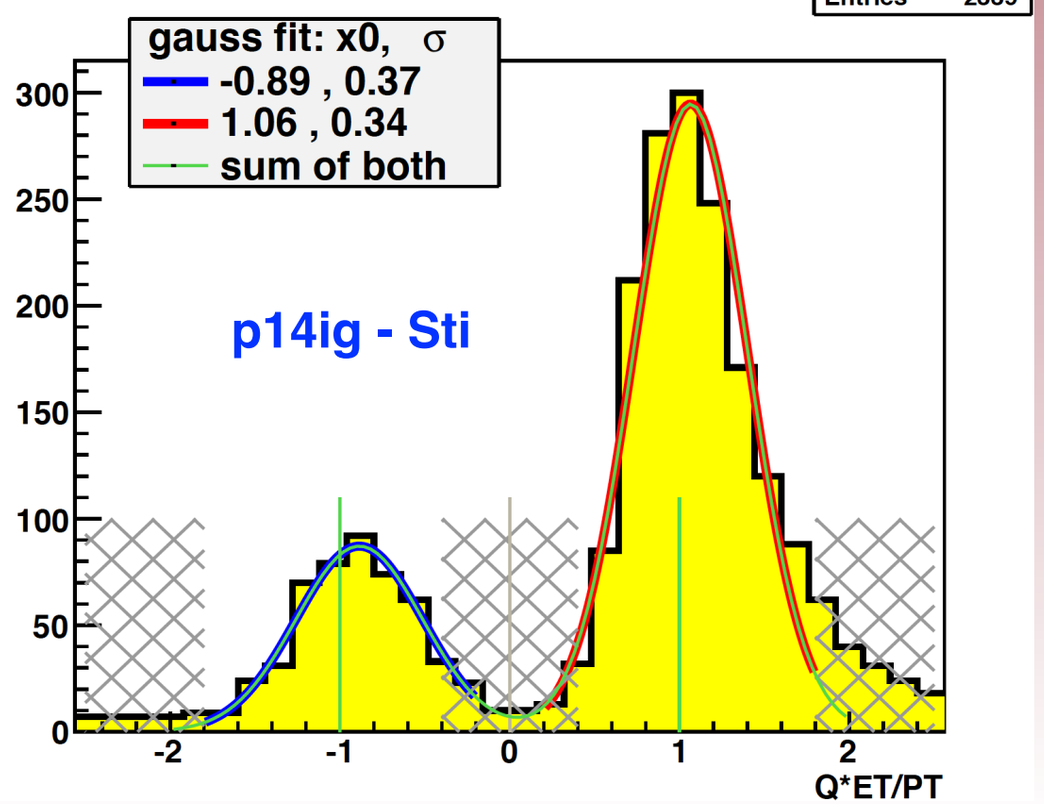

Barrel W: Final Selection : 2011Walgo
χ² / ndf 10.14 / 1
Constant 8.461 ± 0.346
Slope -0.152 ± 0.021
S= 2342 BG = 681
S+B = 3023
S / S+B = 0.77
2x2 cluster ET (GeV)

W -Charge Sign - Separation









Summary