π^0 and η Single Spin Asymmetries with the Central Arm in $p^\uparrow + p$ collisions at 200 GeV

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Abstract

We extract single transverse spin asymmetries of π^0 and η mesons from the transversely polarized run 08 pp $\sqrt{s}$=200 GeV data sample at mid rapidity using the central arm. The high luminosity, high polarization and vertically polarized beams deliver a dataset with a figure of merit more than 300 times larger than the run02 dataset. Using the new dataset we: repeat and expand the $A_N^{\pi^0}$ analysis to higher p_T; extract for the first time at $\sqrt{s}$=200 GeV A_N^{η} at y≈0; and search for non-zero asymmetries by imposing x_F and η cuts.

The results are consistent with zero with statistical accuracy ranging from $6.3 \cdot 10^{-4}$ ($4.9 \cdot 10^{-3}$) to $3.7 \cdot 10^{-2}$ ($5.5 \cdot 10^{-2}$) for low to high p_T π^0 (η) mesons. The asymmetries are expected to provide constraints on the gluon Sivers function and provide insight to the origin of the large single spin asymmetries measured at high x_F by the PHENIX[1, 2], STAR[3, 4] and BRAHMS[5, 6] collaborations.

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1 Motivation

The single transverse spin asymmetry, A_N, is the difference over the sum of the number of particles produced to the left or right in the collision between a transversely polarized beam and an unpolarized target. This quantity has been measured previously using a variety of hadrons at several energies. However, the RHIC measurements are distinct from the previous measurements. Pertubative QCD describes the cross-section of hadrons and jets at both $\sqrt{s} = 62$ and $200\,GeV$[7, 8].

The asymmetries presented in this note have been measured previously. One of the first PHENIX spin papers was on the π^0 asymmetry [9]. In addition, the π^0 asymmetries have been measured by the E704 collaborations at $\sqrt{s}$=20 GeV [10]. Their asymmetries are shown in figure 1 Unfortunately, the current $\sqrt{s}$=200 GeV measurement's x_T range falls short of E704's range. The E704 data covers the range of 0< x_T <0.5, which at $\sqrt{s}$=200 GeV would require the measurement of π^0's well beyond the range of even our central arm calorimeter. A merged cluster measurement may be possible, but if the high x_T region captures someone's interest the $\sqrt{s}$=62 GeV data may be more promising.

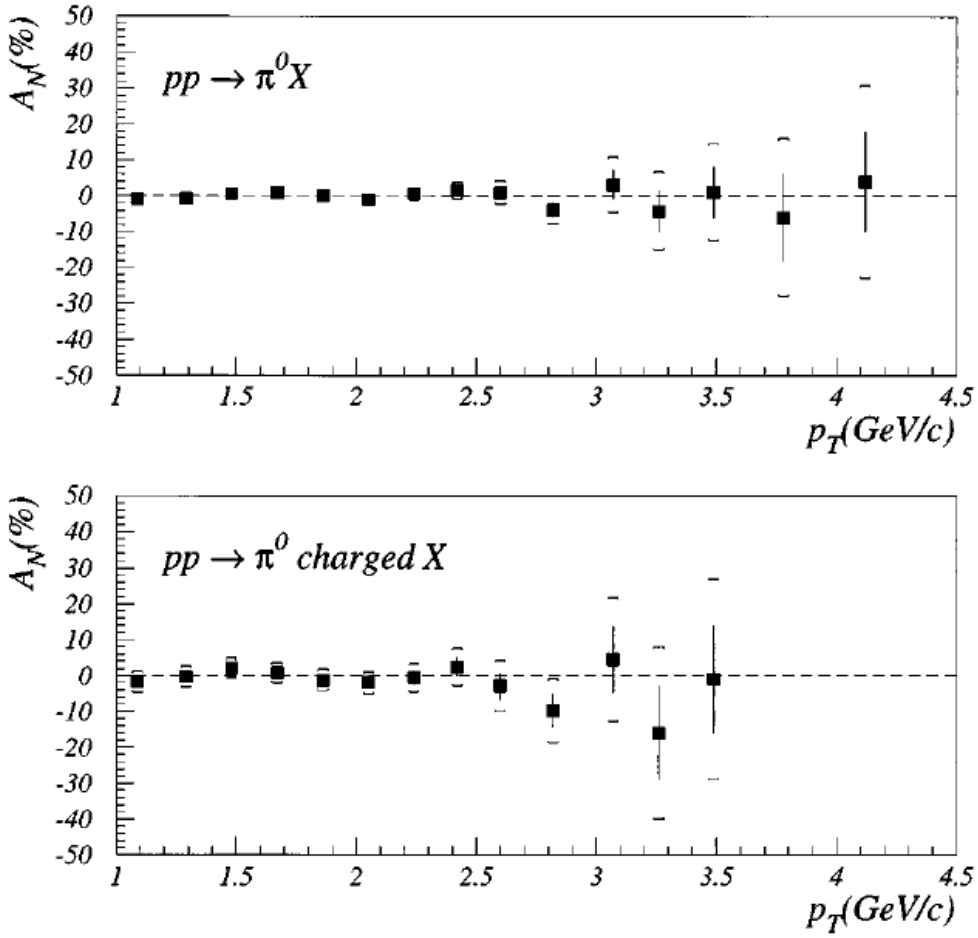

FIG. 4. The asymmetry parameter A_N as a function of p_T at $x_F = 0$ (a) for the inclusive reaction $p\uparrow + p \to \pi^0 + X$ and (b) for the same reaction, but when at least one charged particle is also detected at an azimuthal angle within $(180 \pm 30)^\circ$ relative to the π^0.

Figure 1: $A_N^{\pi^0}$ measured by the E704 collaboration at $\sqrt{s} = 20GeV$. Figure taken from [10]

2 Detector QA

The analysis is based on particle identification cuts originally developed for the measurement of double-longitudinal spin asymmetries and cross-sections [11, 12, 13]. Where possible we provide comparison to these analyses.

Runs are eliminated. Then, using the set of remaining runs, fill by fill and sector by sector energy calibrations are determined from ERT triggered data using fits to π^0 mass values determined from two photon mass peaks. The detector stability is verified by examining the π^0 and η peak values as a function of fill over the entire dataset for the triggered data. Finally, to check for nonlinearities in the detector response, the peak properties are shown as a function of p_T using the triggered dataset.

2.1 Run selection

1. **Spin Database:** The following runs have no information in the spin database:

   `256724 257502 257517 257644 257649 258663 258808 258950 259050 259572`

   In addition, the following runs are from the same fill but do not have the same spin pattern:

   `256990 257001 257002 257003 257004 256989`

2. **No official polarization** Fill 9947 does not have an official blue beam polarization. For ease of analysis the entire fill is rejected:

   `257792 257793 257794 257797 257798 257799 257802 257803`

3. **Non-vertical polarization** Some runs at the beginning of run8 were radially polarized:

   `256450 256451 256452 256454`

4. **One run fills** After applying the previous cuts, fills 9974 and 9910 consisted of only one run. To ensure good fits for the η mass peak, the corresponding runs were removed from analysis:

   `258634 257275`

2.2 Energy scale

No PHENIX recalibrators are applied to the data. Cluster energies are adjusted by hand using fill by fill calibrations which have been derived as part of the quality assurance. The energies of clusters are corrected according to the following two formuli:

$$E_{pbsc} = \frac{E_{pbsc,core}}{0.021 + (1 - 0.02E^{-1}_{pbsc,core})} \tag{1}$$

$$E_{pbgl} = \frac{E_{pbgl,core}}{0.003 + (1 - 0.01E^{-1}_{pbgl,core})} \tag{2}$$

2.2.1 Cluster and pair cuts

The cuts which we apply are a combination of the cuts used in the $A_{LL}^{\pi^0}$ and A_{LL}^{η} analyses [12] [13].

The followings cuts are applied to the event:

1. **Trigger:** The OR of the ERT4x4A&&BBCLL1 and ERT4x4C&&BBCLL1 triggers is used.
2. **Vertex:** between +/- 30 cm. The zvertex is found using `PHGlobal::getBbcZVertex()`.
3. **Crossing:** Unfilled, unfilled crossings are removed from analysis.

The following cuts are applied to clusters:

1. **Warnmap:** Cluster center not in warnmap. The warnmap is supplied by Ken'ichi Nakano [14] as part of his calibration of the EMC. A copy of his representation of the warnmap is given in section A
2. **Minimum cluster energy:** of 200 MeV. This cut is taken from the A_{LL}^{η} analysis note. The standard π^0 minimum energy cut is 200 (100) MeV in the PbGl (PbSc), so I lose some π^0 statistics, but the analysis is simpler. The energy is determined using: `emcClusterContent::ecore`. No non-linearity correction is applied as various analyses have done in the past.
3. **Shower shape:** `emcClusterContent::prob_photon()` > 0.02
4. **Charged particle veto:** An energy dependent pad chamber station 3 matching cut is applied. The code is copied directly from the run05 $A_{LL}^{\pi^0}$ analysis code. The best place to find the documentation is in that note [11]. The angle between the cluster center of gravity and the nearest hit in Pad Chamber 3 is calculated. Charged particles bend in the magnetic field, so the formula for which angles to reject is energy dependent. Very small opening angles were probably caused by a photon which converted to an electron-positron pair very close to the PC3, and the two electrons likely merged to a single cluster. The large angle difference indicates that no charged tracks were in the vicinity of the electromagnetic cluster. The formula for the PbSc is:
   $0.007624 - 0.002926E + 0.001745E^2 < \theta < 0.02301 - 0.005233E + 0.07415e^{-6.137E}$
   and in the PbGl
   $0.01274 - 0.02140E + 0.02262E^2 < \theta < 0.04807 - 0.02982E + 0.7999e^{-25.5E}$

The following cuts are applied to cluster pairs:

1. **Same arm:** Clusters must both be in either the east or west arm
2. **Energy asymmetry:** π^0: < 0.8, η: < 0.7
3. **Active SM trigger bit:** The cluster with the high energy must have an active trigger bit in its supermodule (where I define supermodule as a 12x12 block of towers, i.e. the FEM rather than the hardware definition of supermodule). The lookup is dependent on which trigger is currently being analyzed. The lookup code can be found in the wiki. [15].

2.2.2 Energy scale recalibration

A check was performed on the calibrations by forming di-photon invariant mass histograms for each fill and each sector for photon pairs with pt between 2 and 12 GeV/c. The peaks are fit with a Gaussian plus a pol3 in the mass region of the π^0. There is a small (O((5% shift) but noticeable time dependency to the gain which is balanced out on a fill by fill basis. Figure 2 shows the peak positions.

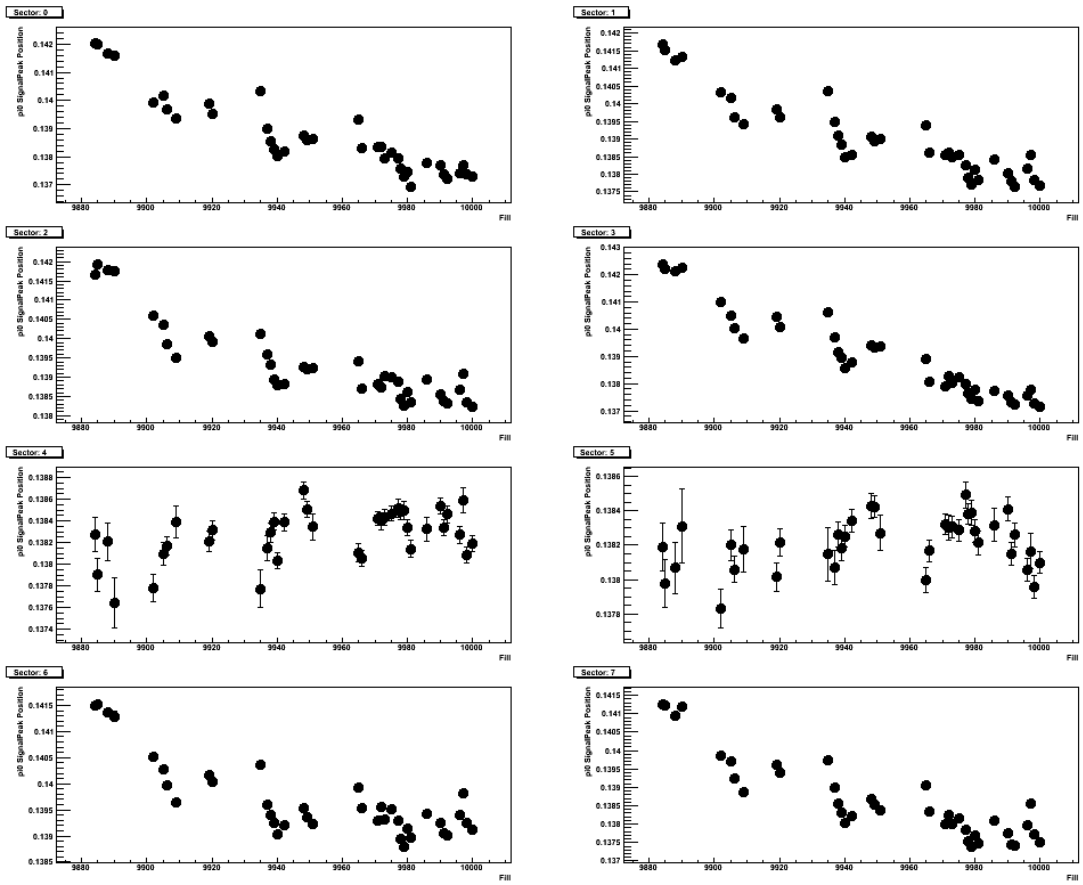

Figure 2: Trigger: ERT4x4(A||C)&&BBCLL1, Xaxis: Fill number, Yaxis: π^0 Peak position. Calibrations used are the default run08 calibrations. Different panels correspond to different sectors in the EMCal. Sectors four and five are lead glass while the other six are lead scintillator.

2.3 Peak stability

After the fill-by-fill gain balancing step, di-photon mass histograms are generated and fit with a Gaussian + pol3 around the π^0 and η mass regions (same function as previous section) to check that the the peak position, peak width and ratio of background over signal+background is stable against fill number.

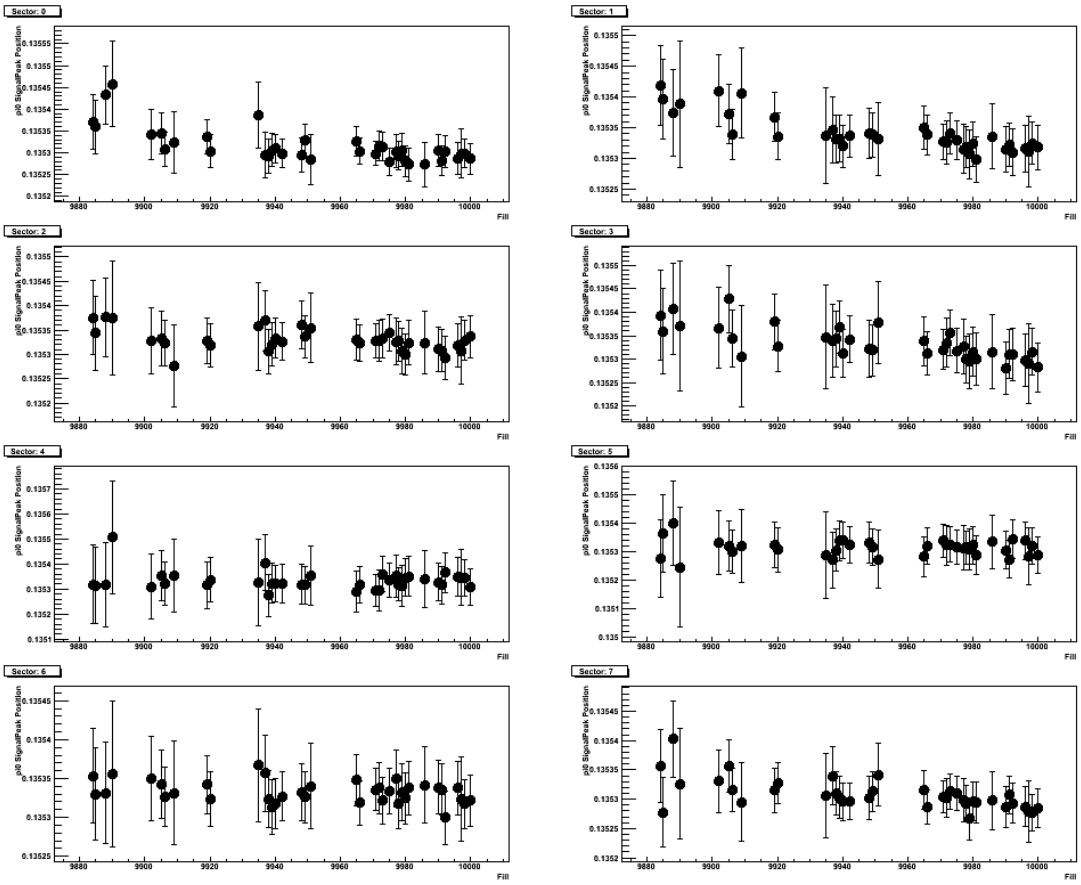

Figure 3: Trigger: ERT4x4(A||C)&&BBCLL1. Mass peak positions for the π^0 using calibrations derived in previous section.

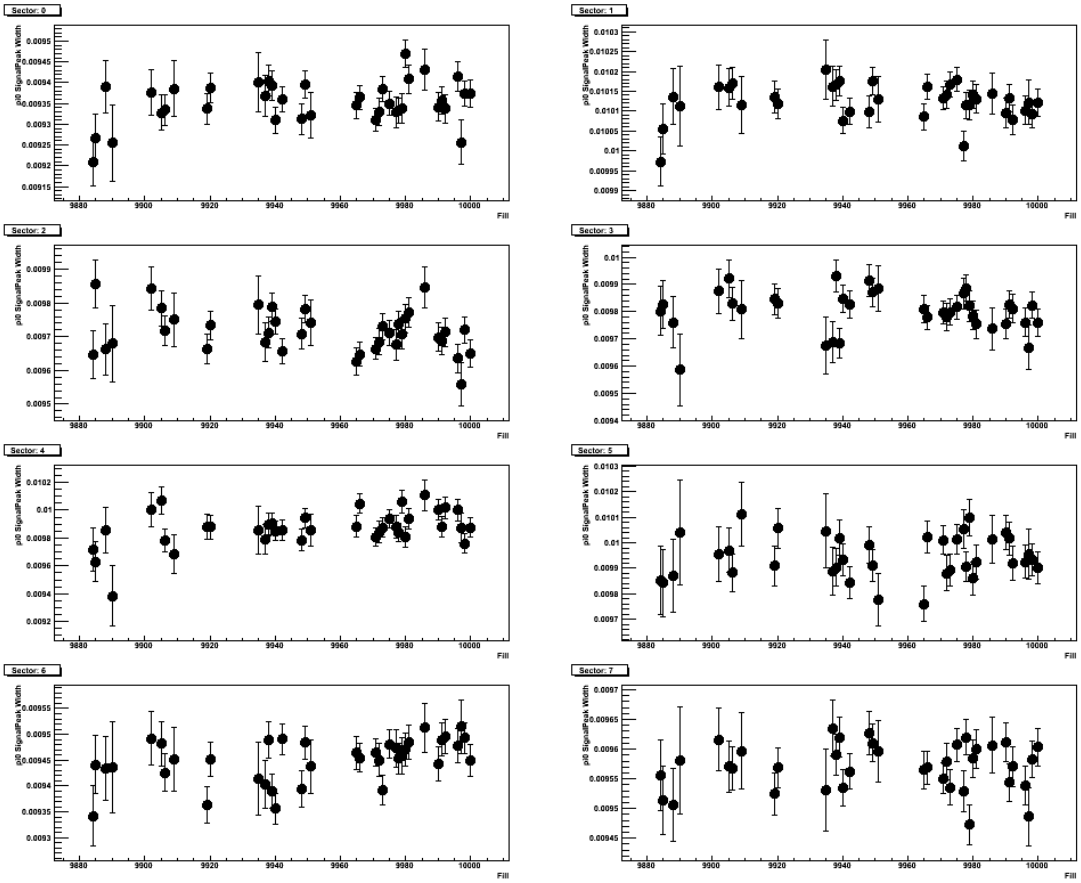

Figure 4: Trigger: ERT4x4(A||C)&&BBCLL1. Mass peak widths for the π^0 using calibrations derived in previous section.

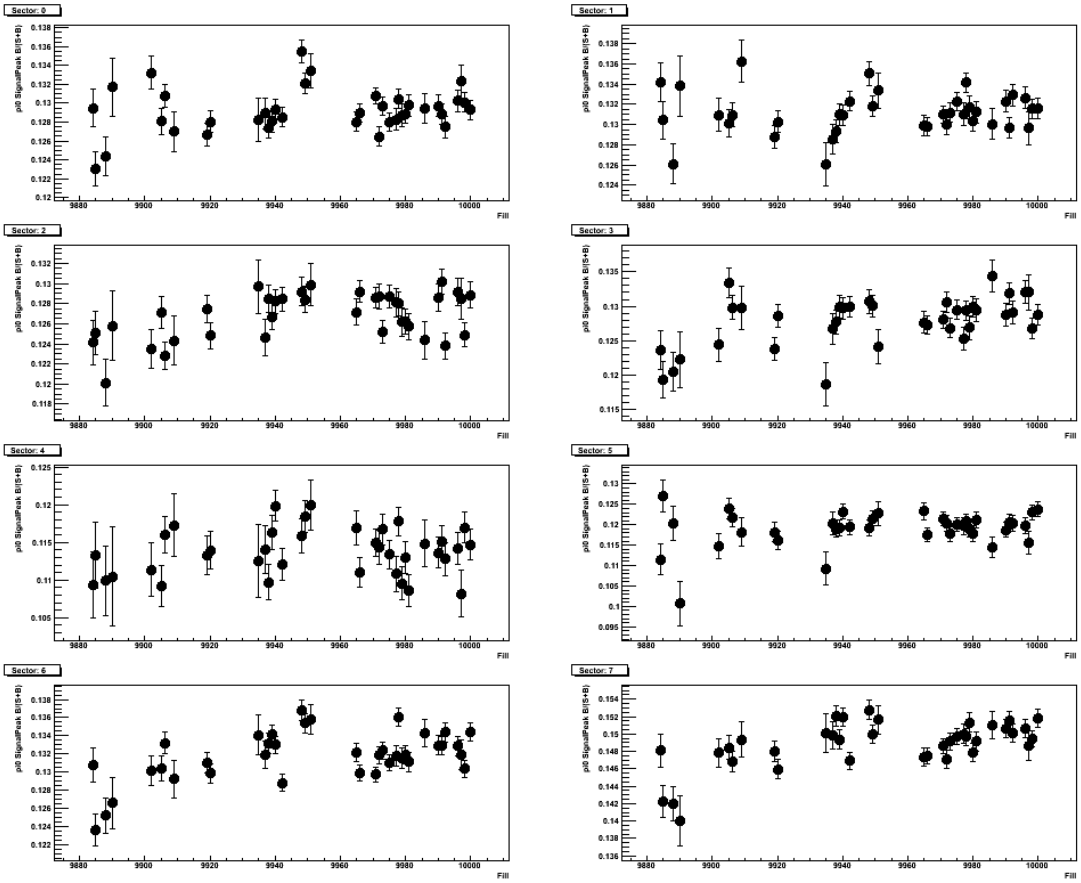

Figure 5: Trigger: ERT4x4(A||C)&&BBCLL1. Background/(Signal+Background) ratios for the π^0 using calibrations derived in previous section.

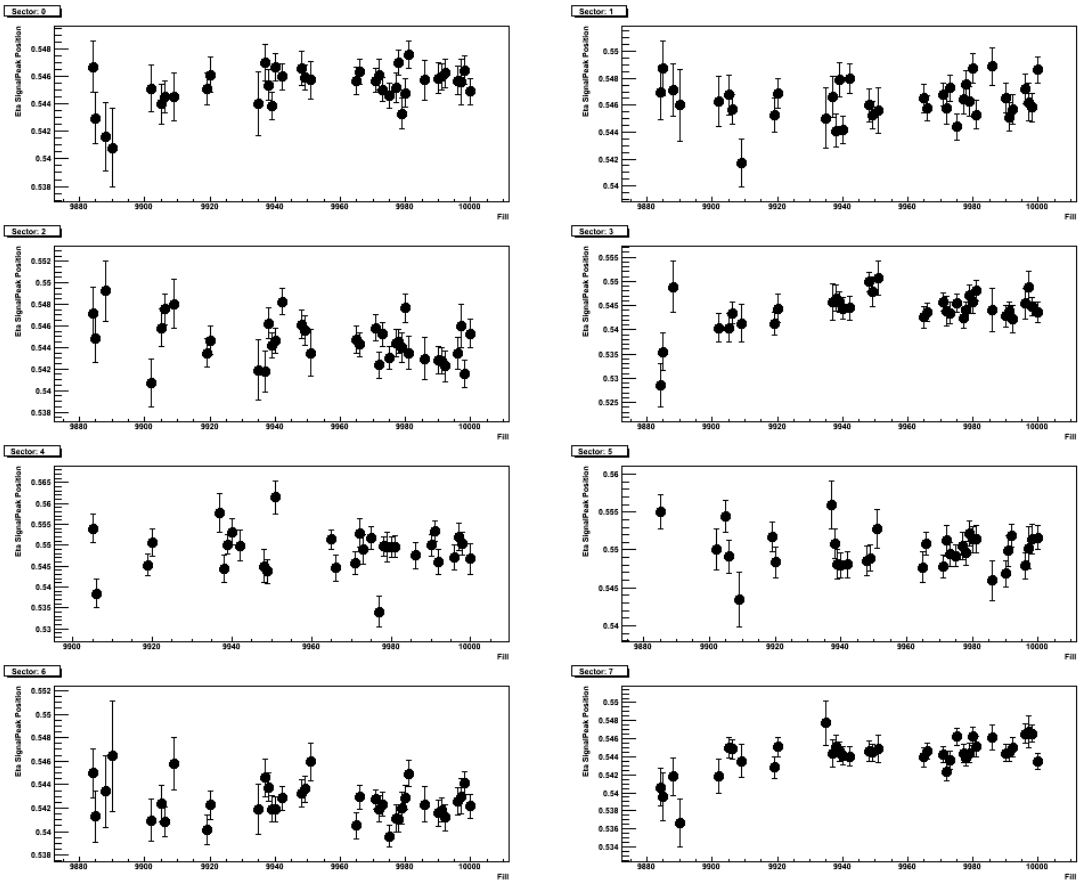

Figure 6: Trigger: ERT4x4(A||C)&&BBCLL1. Mass peak positions for the η using calibrations derived in previous section.

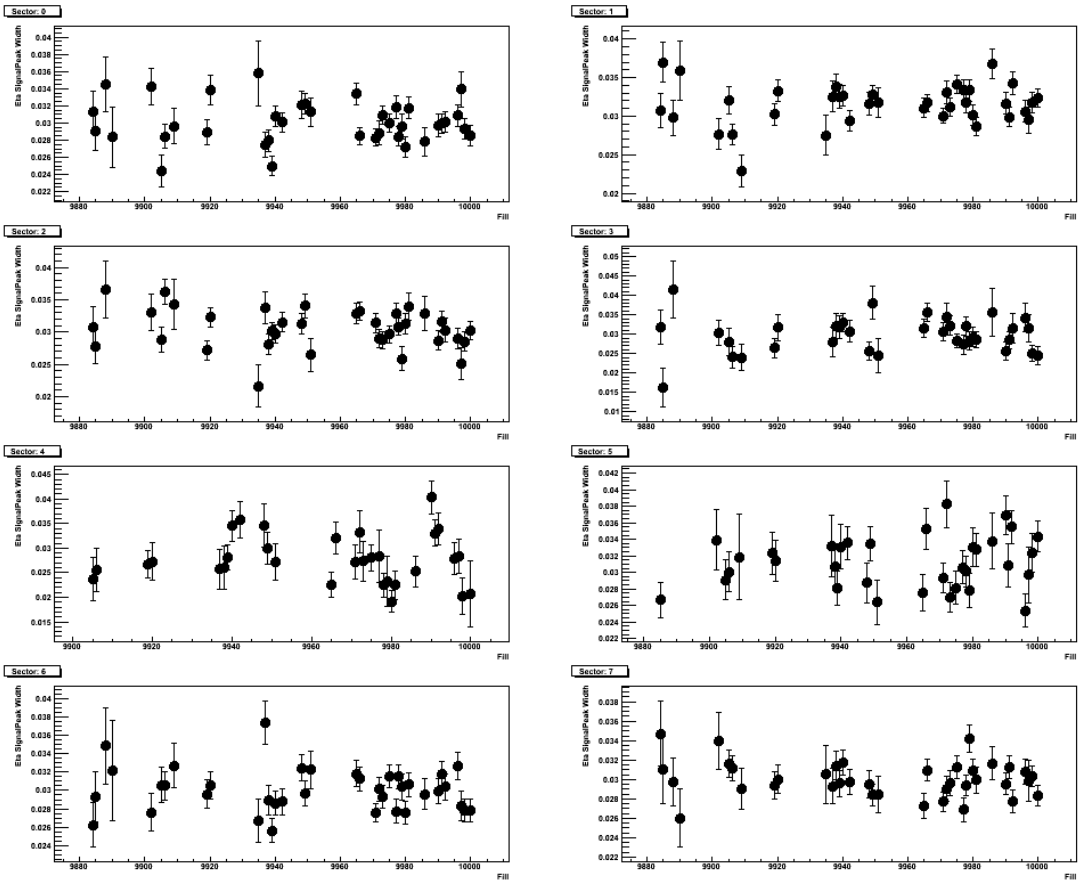

Figure 7: Trigger: ERT4x4(A||C)&&BBCLL1. Mass peak widths for the η using calibrations derived in previous section.

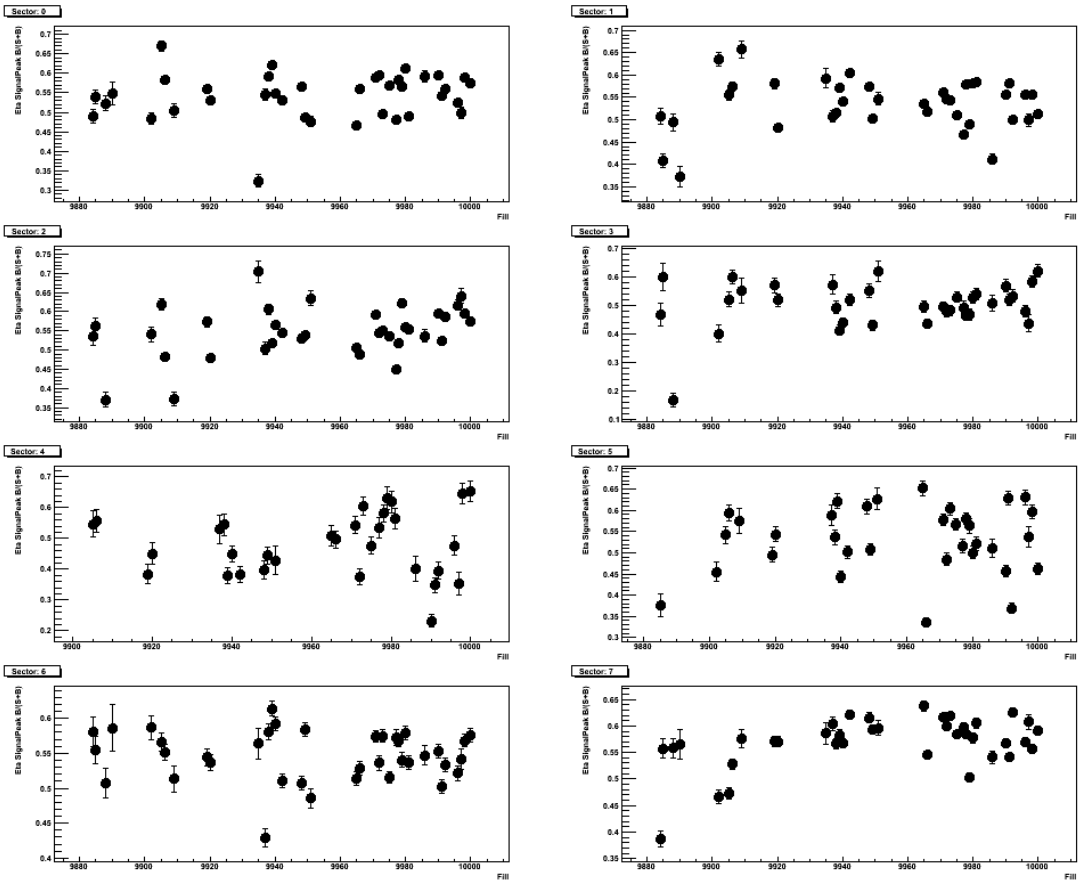

Figure 8: Trigger: ERT4x4(A||C)&&BBCLL1. Background/(Signal+Background) ratios for the η using calibrations derived in previous section.

2.4 Peak position properties versus p_T

After the detector has been verified to be stable against time, invariant mass histograms are generated in bins of p_T. Separate binning in p_T is used between the π^0 and the η since the π^0 has much better yields. Peak positions, widths and B/(S+B)'s are plotted against p_T where the π^0 integration range is 112 MeV to 162 MeV and the η integration range is 480 MeV to 620 MeV (same as [11, 13]). The fits are separated by even crossings only, odd crossings only and by all crossings and by either the PbSc or PbGl. The fast monte-carlo values are taken, by hand, from AN649's plots.

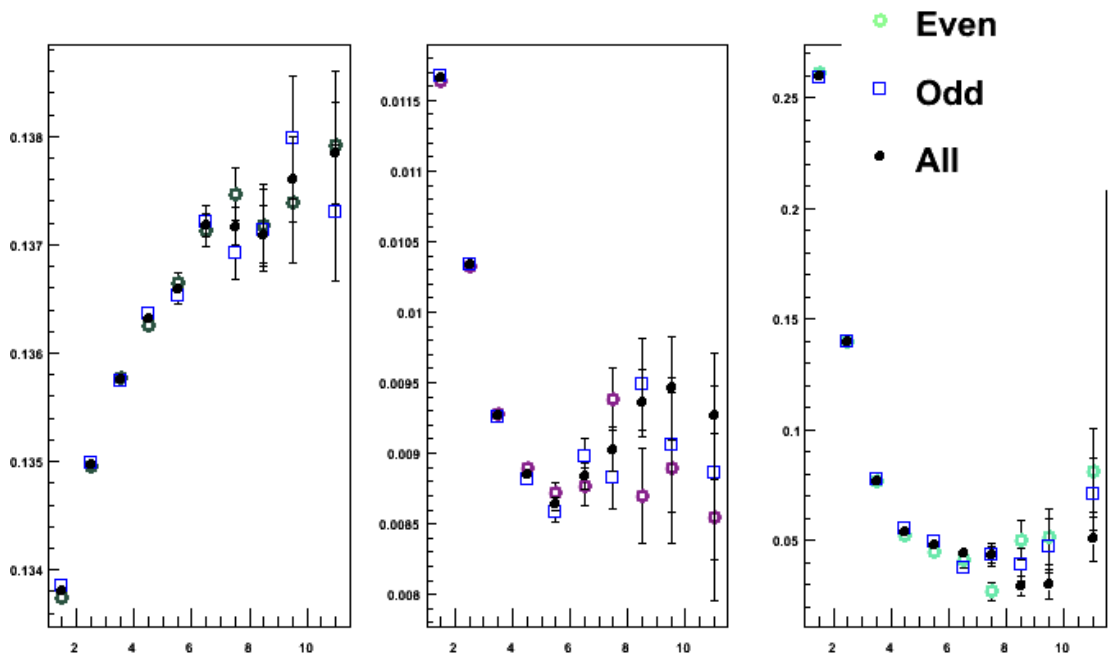

Figure 9: Detector: Lead glass, Trigger: ERT4x4(A||C)&&BBCLL1. From left to right, π^0 peak position, π^0 peak width, π^0 Background/(Signal+Background) ratio plotted against p_T. (Red,Blue,Black) points correspond to (Even,Odd,All) crossings.

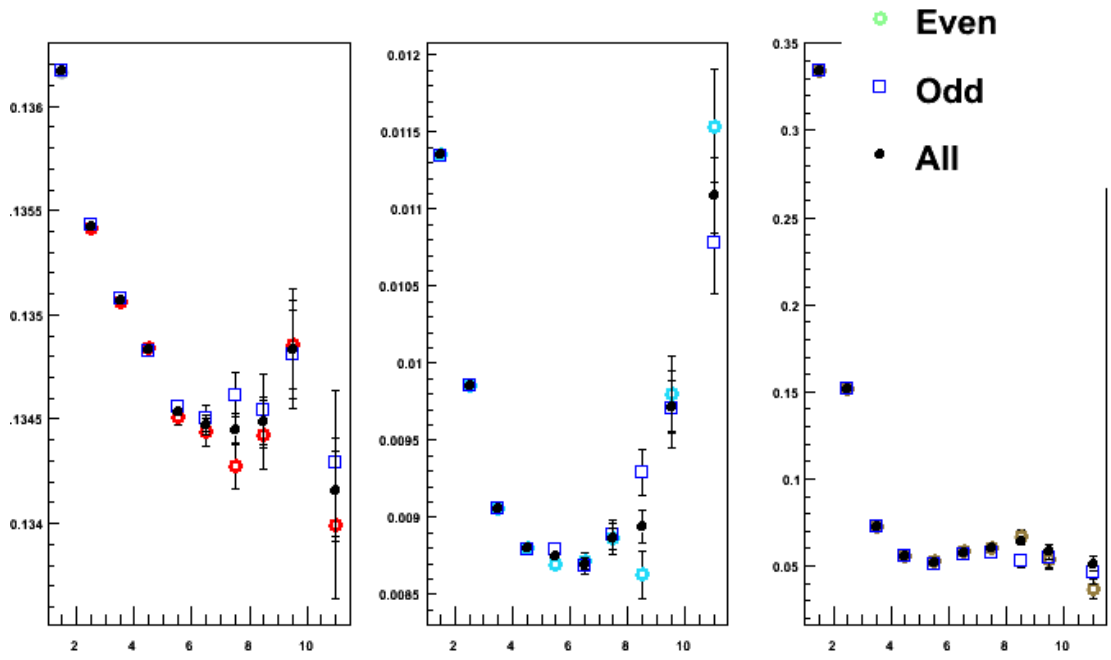

Figure 10: Detector: Lead scintillator, Trigger: ERT4x4(A||C)&&BBCLL1. From left to right, π^0 peak position, π^0 peak width, π^0 Background/(Signal+Background) ratio plotted against p_T. (Red,Blue,Black) points correspond to (Even,Odd,All) crossings.

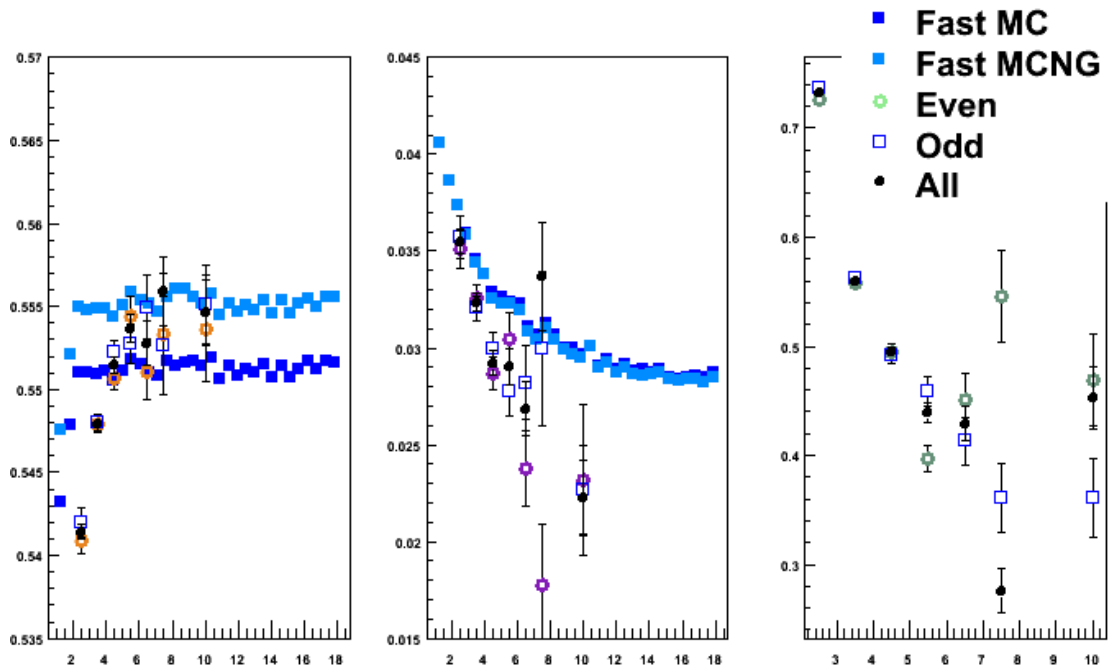

Figure 11: Detector: Lead glass, Trigger: ERT4x4(A||C)&&BBCLL1. From left to right, η peak position, η peak width, η Background/(Signal+Background) ratio plotted against p_T. (Red,Blue,Black) points correspond to (Even,Odd,All) crossings.

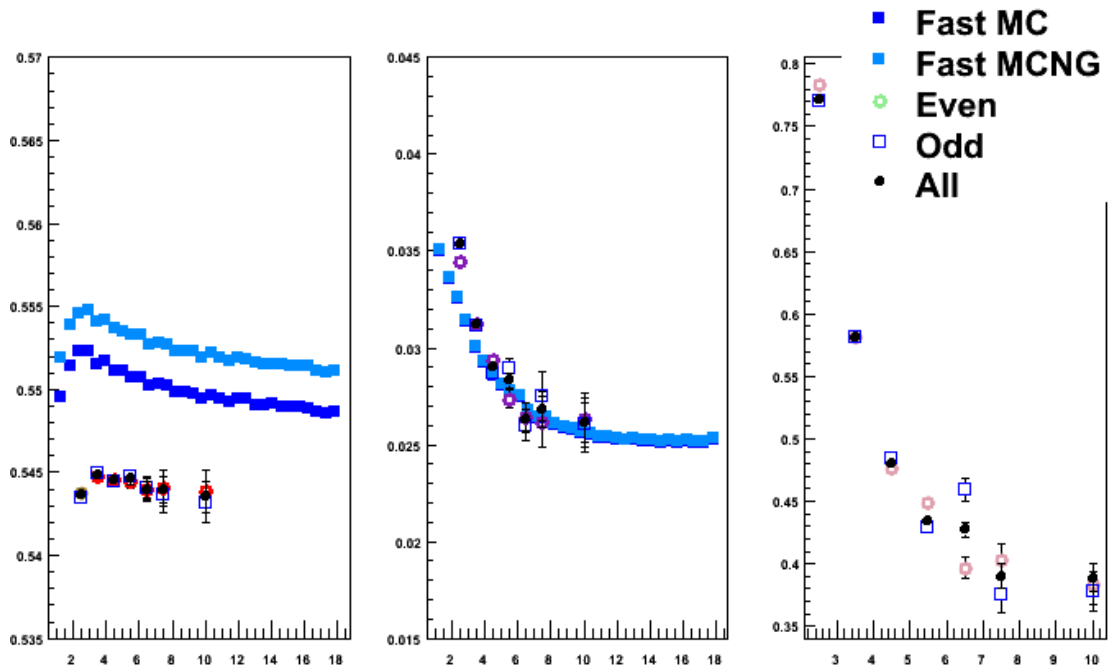

Figure 12: Detector: Lead scintillator, Trigger: ERT4x4(A||C)&&BBCLL1. From left to right, η peak position, η peak width, η Background/(Signal+Background) ratio plotted against p_T. (Red,Blue,Black) points correspond to (Even,Odd,All) crossings.

In the next sections the asymmetry extraction is presented. A crucial component of the analysis is the ratio r, equal to the background over (signal+background). These values, plotted above, are presented in tabular form for the π^0 and η. Asymmetries are extracted without differentiation between the PbSc and PbGl, so the table provides the count-weighted mean of the r values, which are the values used in analysis. The r-value used in analysis is taken from all crossings.

ERT4x4(AC)-BBCLL1, pi0 Signal					
	PbSc		PbGl		Combined
p_T Bin	r	S+B Counts	r	S+B Counts	r
Even Crossings					
1-2	0.334±0.000168	1.18e+07	0.261±0.000836	3.73e+05	0.332
2-3	0.151±0.000143	7.39e+06	0.14±0.000493	5.77e+05	0.151
3-4	0.073±0.000217	1.54e+06	0.0768±0.000606	2.09e+05	0.0734
4-5	0.056±0.000423	3.13e+05	0.0528±0.001	5.28e+04	0.0556
5-6	0.0526±0.000826	7.7e+04	0.0453±0.0018	1.4e+04	0.0514
6-7	0.0584±0.00159	2.31e+04	0.0411±0.00308	4.32e+03	0.0557
7-8	0.0606±0.00272	8.18e+03	0.0273±0.00408	1.64e+03	0.055
8-9	0.0666±0.00439	3.45e+03	0.0504±0.00879	653	0.0641
9-10	0.0534±0.00565	1.67e+03	0.0518±0.0127	324	0.0532
10-12	0.037±0.00543	1.25e+03	0.0816±0.0188	232	0.044
Odd Crossings					
1-2	0.335±0.000162	1.27e+07	0.259±0.000826	3.8e+05	0.332
2-3	0.151±0.000139	7.86e+06	0.14±0.000482	6.03e+05	0.151
3-4	0.0728±0.000211	1.63e+06	0.0773±0.000594	2.19e+05	0.0733
4-5	0.0562±0.000412	3.31e+05	0.0552±0.001	5.5e+04	0.056
5-6	0.051±0.000796	8.06e+04	0.0492±0.00184	1.46e+04	0.0507
6-7	0.0563±0.00152	2.45e+04	0.0377±0.00287	4.57e+03	0.0533
7-8	0.0574±0.00257	8.72e+03	0.0435±0.00508	1.68e+03	0.0551
8-9	0.0532±0.00379	3.71e+03	0.0392±0.0073	736	0.0509
9-10	0.0549±0.00566	1.71e+03	0.0476±0.0122	321	0.0538
10-12	0.0463±0.00619	1.21e+03	0.071±0.0165	262	0.0507
All Crossings					
1-2	0.335±0.000117	2.45e+07	0.26±0.000588	7.53e+05	0.332
2-3	0.151±9.97e-05	1.52e+07	0.14±0.000345	1.18e+06	0.151
3-4	0.0729±0.000152	3.17e+06	0.0771±0.000424	4.28e+05	0.0734
4-5	0.0561±0.000295	6.43e+05	0.0542±0.000709	1.08e+05	0.0558
5-6	0.0519±0.000574	1.58e+05	0.0479±0.00129	2.86e+04	0.0513
6-7	0.0577±0.0011	4.76e+04	0.0441±0.00223	8.89e+03	0.0555
7-8	0.0606±0.00189	1.69e+04	0.0438±0.00363	3.33e+03	0.0578
8-9	0.0638±0.00298	7.17e+03	0.0296±0.0046	1.4e+03	0.0582
9-10	0.0583±0.00415	3.39e+03	0.0304±0.00679	660	0.0538
10-12	0.0514±0.00456	2.47e+03	0.0508±0.0101	500	0.0513

Table 1: Background contamination values for PbSc/PbGl and for even/odd/all crossings

ERT4x4(AC)-BBCLL1, Eta Signal					
	PbSc		PbGl		Combined
p_T Bin	r	S+B Counts	r	S+B Counts	r
Even Crossings					
2-3	0.784±0.000631	1.97e+06	0.726±0.0033	6.66e+04	0.782
3-4	0.582±0.00127	3.63e+05	0.557±0.00431	3e+04	0.58
4-5	0.476±0.00255	7.31e+04	0.494±0.0076	8.56e+03	0.478
5-6	0.449±0.00493	1.84e+04	0.397±0.0124	2.57e+03	0.442
6-7	0.397±0.0084	5.63e+03	0.451±0.0233	832	0.404
7-8	0.402±0.014	2.06e+03	0.546±0.0422	307	0.421
8-12	0.384±0.0163	1.44e+03	0.469±0.0422	263	0.397
Odd Crossings					
2-3	0.771±0.000607	2.09e+06	0.737±0.00327	6.91e+04	0.77
3-4	0.581±0.00123	3.82e+05	0.562±0.00421	3.17e+04	0.58
4-5	0.484±0.0025	7.73e+04	0.491±0.00743	8.89e+03	0.485
5-6	0.429±0.00468	1.96e+04	0.459±0.0132	2.61e+03	0.433
6-7	0.459±0.00887	5.84e+03	0.413±0.0214	901	0.453
7-8	0.375±0.0133	2.11e+03	0.361±0.0319	354	0.373
8-12	0.378±0.0158	1.51e+03	0.36±0.0361	277	0.375
All Crossings					
2-3	0.771±0.000436	4.05e+06	0.732±0.00232	1.36e+05	0.77
3-4	0.582±0.000883	7.45e+05	0.56±0.00301	6.17e+04	0.58
4-5	0.48±0.00179	1.5e+05	0.495±0.00532	1.75e+04	0.482
5-6	0.435±0.00338	3.8e+04	0.439±0.00918	5.21e+03	0.435
6-7	0.427±0.0061	1.15e+04	0.429±0.0156	1.77e+03	0.428
7-8	0.39±0.00964	4.2e+03	0.276±0.0197	712	0.374
8-12	0.389±0.0114	2.99e+03	0.452±0.0284	561	0.399

Table 2: Background contamination values for PbSc/PbGl and for even/odd/all crossings

3 Analysis

3.1 Analysis chain

1. Generate μDST of photon pairs using the standard central arm pairs cuts already detailed in section 2.2.1 at CCJ. Applying these π^0 cuts reduces the dataset to 15 gigabytes. The DST's are transferred to RCF for analysis.

2. Run over the DST's finding spin dependent yields.

All source-code can be found here:

`/phenix/u/workarea/jkoster4/devel/CentAn/`

3.2 Kinematic binning

The π^0 signal region is taken as 112-162 MeV. The π^0 background region is taken as 47-97 MeV and 177-227 MeV. The η signal region is taken as 480 to 620 MeV. The η background region is taken as 300-400 MeV and 700 to 800 MeV. The asymmetries are binned in p_T as following:

p_T binning			
π^0_{Signal}	$\pi^0_{Background}$	η_{Signal}	$\eta_{Background}$
1-2	1-2	-	-
2-3	2-3	2-3	2-3
3-4	3-4	3-4	3-4
4-5	4-5	4-5	4-5
5-6	5-6	6-7	5-12
6-7	6-12	7-8	5-12
7-8	6-12	8-12	5-12
8-9	6-12	-	-
9-10	6-12	-	-
10-11	6-12	-	-

They are also binned identically in x_F and η.

3.3 Choice of trigger

All asymmetries are calculated using the or of the 4x4A and 4x4C triggers. The 4x4A trigger gives the best statistics for high p_T but the lower threshold 4x4C trigger has better statistics at low p_T.

3.4 Asymmetry calculation

3.4.1 Description of coordinate system

We work in the PHENIX crossing coordinate system and access the crossing number by the method:

```
TrigLvl1::get_lvl1_clock_cross(intcrossing)
```

Access to the spin pattern and beam polarization are done with the SpinDBContent class through its methods: GetPolarizationBlue, GetPolarizationYellow and GetSpinPatternBluePHENIX, GetSpinPatternYellowPHENIX. For run8pp if the spin pattern methods return the values 1,-1 and 10, it means spin down, spin up and unfilled (That is not a typo: 1 = spin down).

3.4.2 Formulae

The formuli used to measure a left-right raw asymmetry is:

$$\epsilon_{lumi} = \frac{N_{\uparrow} - RL \cdot N_{\downarrow}}{N_{\uparrow} + RL \cdot N_{\downarrow}} \tag{3}$$

Where RL is the relative luminosity between the two beams. Separately, $\epsilon_{lumi,left}$ and $\epsilon_{lumi,right}$ are calculated, then statistically combined using the formula

$$\epsilon_{lumi} = \frac{\epsilon_{lumi,left}\delta\epsilon^{-2}_{lumi,left} - \epsilon_{lumi,right}\delta\epsilon^{-2}_{lumi,right}}{\delta\epsilon^{-2}_{lumi,left} + \delta\epsilon^{-2}_{lumi,right}} \tag{4}$$

$A_{N,lumi}$ is then calculated as

$$A_{N,lumi} = \frac{\epsilon_{lumi}}{P\langle|cos(\phi)|\rangle} \tag{5}$$

$$\delta A_{N,lumi} = \frac{\delta\epsilon_{lumi}}{P\langle|cos(\phi)|\rangle} \tag{6}$$

where P stands for the beam polarization of either the blue or yellow beam. The $\langle|cos(\phi)|\rangle$ term is a geometric correction factor which weights the asymmetry by the azimuthal distribution of particles around the spin direction. It is determined and applied from data on a fill by fill basis. No error is propagated to account for the angular resolution of the calorimeter. In the calculation of the error of A_N the polarization error is not applied. The polarization uncertainty affects all asymmetry points in the same way, and is taken as a scale uncertainty on A_N.

An alternate method for calculating the left-right asymmetry is the so called "square root" formula.

$$\epsilon_{N,sqrt} = \frac{\sqrt{N_{\uparrow,L} \cdot N_{\downarrow,R}} - \sqrt{N_{\uparrow,R} \cdot N_{\downarrow,L}}}{\sqrt{N_{\uparrow,L} \cdot N_{\downarrow,R}} + \sqrt{N_{\uparrow,R} \cdot N_{\downarrow,L}}} \tag{7}$$

Where conversion between the raw left-right asymmetry and the analyzing power is done in the same way as the luminosity asymmetry. After the asymmetry of signal+background and background have been measured, the signal asymmetry is calculated as:

$$A_N^{\pi^0} = \frac{A_N^{\pi^0+BG} - rA_N^{BG}}{1-r} \tag{8}$$

$$\delta A_N^{\pi^0} = \frac{\sqrt{\sigma^2_{A_N^{\pi^0+BG}} + r^2\sigma^2_{A_N^{BG}}}}{1-r} \tag{9}$$

which ignores the statistical error on the r value. Separate spin analyses are carried out for the even and odd crossings to avoid potential trigger complications stemming from separate trigger circuits for even and odd crossings. For each kinematic bin, a fill is rejected if the number of counts entering the asymmetry calculation is less than 30. This avoids potential problems in the breakdown of the error calculation in the limit of small statistics.

3.4.3 Relative luminosity

Relative luminosity is calculated fill to fill using the GL1-1P scaled BBCLL1 trigger (with +/- online 30 cm vertex selection). The values are plotted against fill in figure 13.

3.4.4 $k_{enhance}$

The error bars of all asymmetries require adjustment to account for the fact that in some events multiple counts are recorded. AN567 [11] justifies and derives the k-factor which corrects the error bar according to the mean multiplicity. The formula used is:
$\delta A_N = k_{enhance}\delta A_{N,Poisson}$
$k_{enhance} = \sqrt{\frac{\bar{k^2}}{\bar{k}}}$

3.5 Final Asymmetries

The quality of the fits across fills, consistency of the results between even/odd crossings and blue/yellow beams, and details of the statistical subtraction are given in appendices B, C and D respectively. Final results are shown below. The $\langle\eta\rangle$ is defined with respect to the polarized beam, i.e. for a fixed photon pair, the sign of η flips between the two beams.

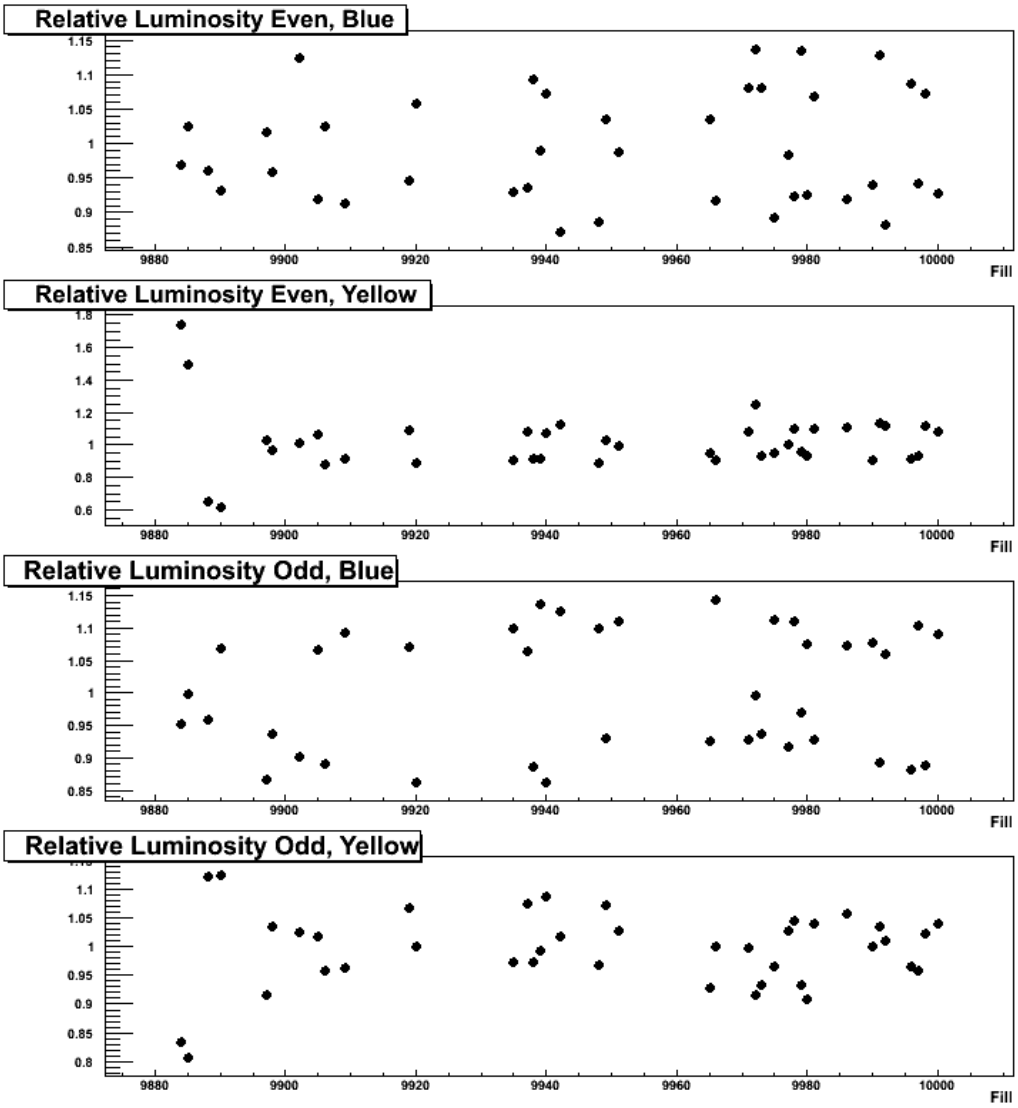

Figure 13: Relative luminosity calculated using the BBCLL1 trigger scaled using the GL1-1P and using the PHENIX crossing coordinate system.

AN567		AN864			
	Inclusive		Inclusive	$\lvert x_F \rvert > 0.01$	$\lvert \eta \rvert > 0.02$
p_T bin	$k^{\pi^0}_{enhance}$	p_T bin	$k^{\pi^0}_{enhance}$	$k^{\pi^0}_{enhance}$	$k^{\pi^0}_{enhance}$
0.5-0.75	1.08 (1.11)	-	-	-	-
0.75-1.0	1.05 (1.08)	-	-	-	-
1.0-1.5	1.06 (1.09)	1.0-2.0	1.077 (1.127)	-	1.053 (1.09)
1.5-2.0	1.05 (1.08)	-	-	-	-
2.0-2.5	1.03 (1.07)	2.0-3.0	1.039 (1.090)	1.005 (1.018)	1.0262 (1.0646)
2.5-3.0	1.02 (1.06)	-	-	-	-
3.0-3.5	1.01 (1.06)	3.0-4.0	1.015 (1.065)	1.008 (1.015)	1.018 (1.049)
3.5-4.0	1.01 (1.05)	-	-	-	-
4.0-5.0	1.01 (1.07)	4.0-5.0	1.009 (1.056)	1.006 (1.040)	1.007 (1.041)
5.0-6.0	1.01 (1.07)	5.0-6.0	1.007 (1.043)	1.006 (1.036)	1.006 (1.034)
6.0-7.0	1.01 (1.07)	6.0-7.0	1.005 (-)	1.004 (-)	1.004 (-)
7.0-9.0	1.01 (1.08)	7.0-8.0	1.004 (-)	1.003 (-)	1.004 (-)
-	-	8.0-9.0	1.003 (-)	1.004 (-)	1.004 (-)
-	-	9.0-10.0	1.005 (-)	1.004 (-)	1.003 (-)
-	-	10.0-12.0	1.006 (-)	1.001 (-)	1.009 (-)
-	-	6-12	- (1.073)	- (1.0669)	- (1.050)

Table 3: $k_{enhance}$ factors for the π^0 signal (background). The p_T binning between the run6 A_{LL} and the current A_N analysis don't match up exactly, but are close enough to allow a good comparison. Note that AN567 lists the $k^2_{enhance}$ values while the comparison is done between $k_{enhance}$. A better comparison is between the present analysis and AN602 but it is not possible. The values are not provided in AN602.

AN649		AN864			
	Inclusive		Inclusive	$\lvert x_F \rvert > 0.01$	$\lvert \eta \rvert > 0.02$
p_T bin	$k^{\eta}_{enhance}$	p_T bin	$k^{\eta}_{enhance}$	$k^{\eta}_{enhance}$	$k^{\eta}_{enhance}$
2-3	1.042 (1.052)	2-3	1.053 (1.066)	1.005 (1.006)	1.040 (1.046)
3-4	1.025 (1.032)	3-4	1.033 (1.044)	1.015 (1.022)	1.024 (1.029)
4-5	1.018 (1.026)	4-5	1.024 (1.035)	1.014 (1.025)	1.017 (1.026)
5-6	1.014 (1.023)	5-6	1.020 (-)	1.011 (-)	1.018 (-)
6-7	1.013 (1.020)	6-7	1.016 (-)	1.015 (-)	1.008 (-)
7-9	1.015 (1.020)	7-8	1.015 (-)	1.013 (-)	1.019 (-)
-	-	8-12	1.032 (-)	1.03 (-)	1.031 (-)
-	-	5-12	- (1.058)	- (1.048)	- (1.042)

Table 4: $k_{enhance}$ factors for the η signal (background).

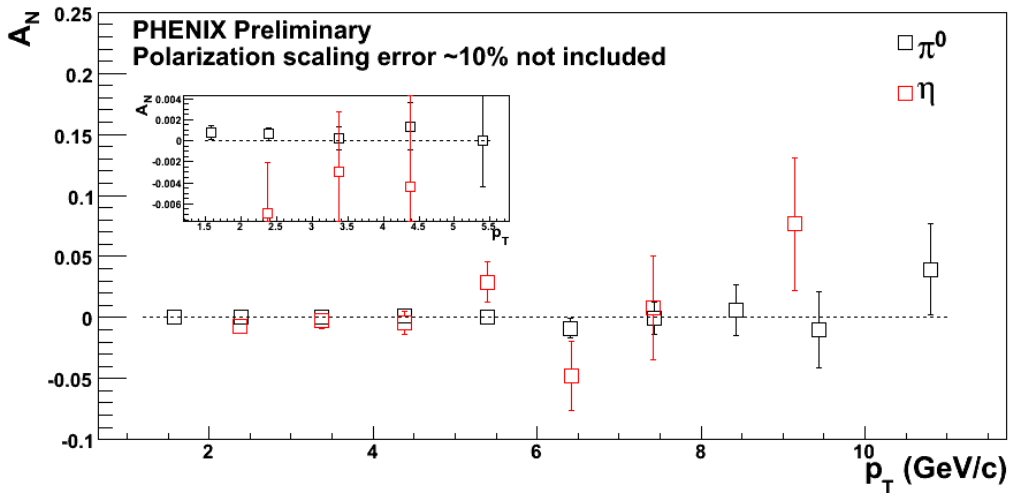

Figure 14: Square root asymmetries for the π^0 and η with an inclusive kinematic selection.

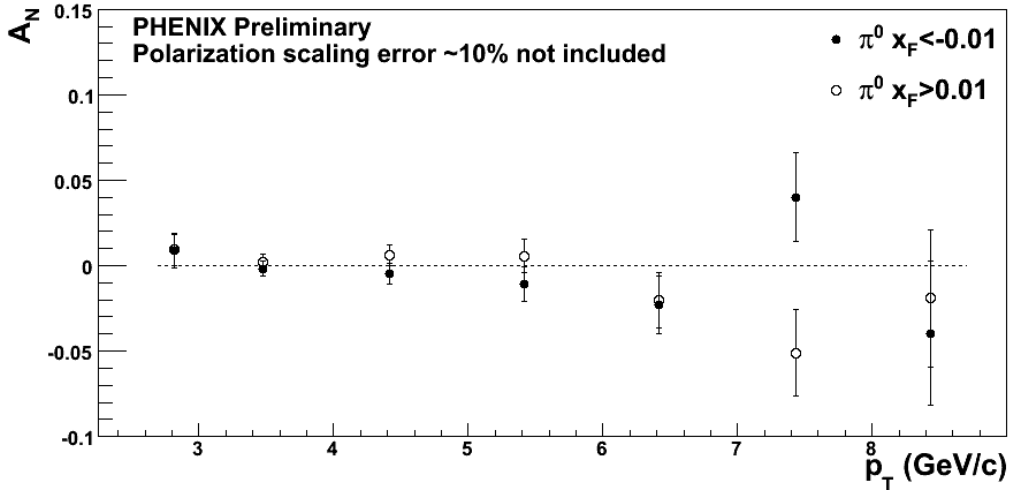

Figure 15: Square root asymmetries for the π^0.

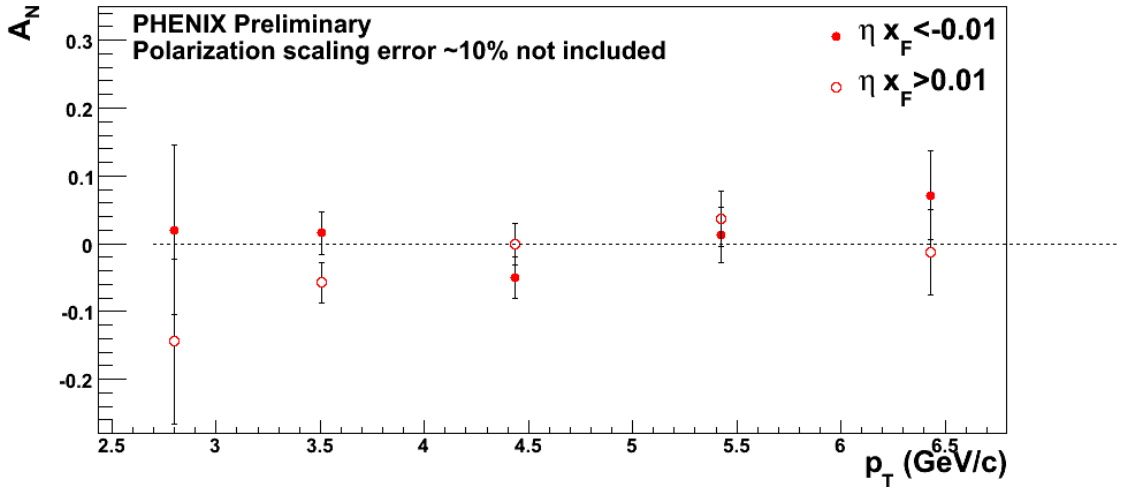

Figure 16: Square root asymmetries for the η.

ERT4x4(AC)-BBCLL1, π^0, Inclusive x_F, Inclusive pseudorapidity					
p_T Bin	$\langle p_T \rangle$	$\langle x_F \rangle$	$\langle \eta \rangle$	$A_{N,sqrt}$	$A_{N,lumi}$
1.0-2.0	1.57	-0.00	0.00	8.00e-04±6.29e-04	8.33e-04±6.28e-04
2.0-3.0	2.39	-0.00	0.00	6.19e-04±5.63e-04	6.24e-04±5.62e-04
3.0-4.0	3.37	0.00	0.00	2.20e-04±1.05e-03	3.08e-04±1.05e-03
4.0-5.0	4.38	-0.00	-0.00	1.35e-03±2.23e-03	1.25e-03±2.23e-03
5.0-6.0	5.40	0.00	-0.00	1.68e-05±4.45e-03	-1.66e-04±4.44e-03
6.0-7.0	6.41	0.00	0.00	-8.89e-03±8.09e-03	-8.96e-03±8.07e-03
7.0-8.0	7.42	-0.00	0.00	-8.57e-04±1.34e-02	-3.09e-03±1.34e-02
8.0-9.0	8.43	0.00	0.00	6.23e-03±2.07e-02	9.09e-03±2.11e-02
9.0-10.0	9.44	-0.00	0.00	-1.02e-02±3.12e-02	-2.74e-02±3.70e-02
10.0-12.0	10.80	-0.00	0.00	3.94e-02±3.73e-02	2.12e-02±8.51e-02

ERT4x4(AC)-BBCLL1, η, Inclusive x_F, Inclusive pseudorapidity					
p_T Bin	$\langle p_T \rangle$	$\langle x_F \rangle$	$\langle \eta \rangle$	$A_{N,sqrt}$	$A_{N,lumi}$
2.0-3.0	2.37	-0.00	-0.00	-6.92e-03±4.88e-03	-6.01e-03±4.84e-03
3.0-4.0	3.37	-0.00	0.00	-2.92e-03±5.71e-03	-4.23e-03±5.69e-03
4.0-5.0	4.38	0.00	-0.00	-4.32e-03±9.82e-03	-4.31e-03±9.79e-03
5.0-6.0	5.40	0.00	-0.00	2.91e-02±1.69e-02	2.71e-02±1.69e-02
6.0-7.0	6.42	0.00	-0.00	-4.77e-02±2.81e-02	-4.07e-02±2.81e-02
7.0-8.0	7.42	-0.00	0.00	8.16e-03±4.24e-02	1.23e-02±4.58e-02
8.0-12.0	9.14	-0.00	0.00	7.64e-02±5.45e-02	-3.16e-02±7.48e-02

ERT4x4(AC)-BBCLL1, π^0, Inclusive x_F, $\eta < -0.2$					
p_T Bin	$\langle p_T \rangle$	$\langle x_F \rangle$	$\langle \eta \rangle$	$A_{N,sqrt}$	$A_{N,lumi}$
1.0-2.0	1.57	-0.00	-0.27	1.85e-03±1.41e-03	2.42e-03±1.39e-03
2.0-3.0	2.39	-0.01	-0.27	1.07e-03±1.32e-03	1.03e-03±1.30e-03
3.0-4.0	3.37	-0.01	-0.27	-1.01e-03±2.51e-03	-8.66e-04±2.48e-03
4.0-5.0	4.38	-0.01	-0.27	-1.84e-03±5.32e-03	-2.11e-03±5.28e-03
5.0-6.0	5.40	-0.02	-0.28	-6.76e-03±1.06e-02	-5.74e-03±1.09e-02
6.0-7.0	6.41	-0.02	-0.28	-1.50e-02±1.97e-02	-
7.0-8.0	7.42	-0.02	-0.28	5.62e-02±3.35e-02	-
8.0-9.0	8.43	-0.02	-0.28	-1.46e-02±9.01e-02	-
9.0-10.0	9.44	-0.03	-0.28	-	-
10.0-12.0	10.80	-0.03	-0.28	-	-

ERT4x4(AC)-BBCLL1, η, Inclusive x_F, $\eta < -0.2$					
p_T Bin	$\langle p_T \rangle$	$\langle x_F \rangle$	$\langle \eta \rangle$	$A_{N,sqrt}$	$A_{N,lumi}$
2.0-3.0	2.36	-0.01	-0.26	6.50e-03±1.26e-02	6.55e-03±1.24e-02
3.0-4.0	3.37	-0.01	-0.26	3.57e-03±1.55e-02	5.92e-03±1.53e-02
4.0-5.0	4.39	-0.01	-0.26	-3.61e-02±2.65e-02	-3.44e-02±2.62e-02
5.0-6.0	5.40	-0.01	-0.26	-2.63e-02±4.52e-02	-3.20e-02±4.69e-02
6.0-7.0	6.42	-0.02	-0.27	8.34e-02±1.12e-01	-
7.0-8.0	7.43	-0.02	-0.27	-	-
8.0-12.0	9.15	-0.02	-0.27	-	-

ERT4x4(AC)-BBCLL1, π^0, Inclusive x_F, $\eta > 0.2$					
p_T Bin	$\langle p_T \rangle$	$\langle x_F \rangle$	$\langle \eta \rangle$	$A_{N,sqrt}$	$A_{N,lumi}$
1.0-2.0	1.57	0.00	0.27	1.28e-03±1.38e-03	1.56e-03±1.35e-03
2.0-3.0	2.39	0.01	0.27	2.26e-03±1.29e-03	2.20e-03±1.27e-03
3.0-4.0	3.37	0.01	0.27	2.01e-03±2.46e-03	2.22e-03±2.42e-03
4.0-5.0	4.38	0.01	0.27	3.02e-03±5.19e-03	1.60e-03±5.14e-03
5.0-6.0	5.40	0.02	0.28	1.30e-02±1.03e-02	1.60e-02±1.05e-02
6.0-7.0	6.41	0.02	0.28	-3.09e-02±1.90e-02	-
7.0-8.0	7.42	0.02	0.28	-5.98e-02±3.25e-02	-
8.0-9.0	8.43	0.02	0.28	3.50e-02±7.56e-02	-
9.0-10.0	9.44	0.03	0.28	-	-
10.0-12.0	10.80	0.03	0.28	-	-

ERT4x4(AC)-BBCLL1, η, Inclusive x_F, $\eta > 0.2$					
p_T Bin	$\langle p_T \rangle$	$\langle x_F \rangle$	$\langle \eta \rangle$	$A_{N,sqrt}$	$A_{N,lumi}$
2.0-3.0	2.36	0.01	0.26	-1.77e-02±1.23e-02	-1.47e-02±1.21e-02
3.0-4.0	3.37	0.01	0.26	-3.51e-02±1.51e-02	-3.59e-02±1.49e-02
4.0-5.0	4.39	0.01	0.26	-6.20e-03±2.59e-02	-8.19e-03±2.55e-02
5.0-6.0	5.40	0.01	0.26	3.71e-03±4.41e-02	1.96e-02±4.55e-02
6.0-7.0	6.42	0.02	0.27	-2.77e-02±9.54e-02	-
7.0-8.0	7.43	0.02	0.27	-	-
8.0-12.0	9.15	0.02	0.27	-	-

ERT4x4(AC)-BBCLL1, π^0, $x_F < -0.01$, Inclusive pseudorapidity					
p_T Bin	$\langle p_T \rangle$	$\langle x_F \rangle$	$\langle \eta \rangle$	$A_{N,sqrt}$	$A_{N,lumi}$
1.0-2.0	-	-	-	-	-
2.0-3.0	2.82	-0.01	-0.37	8.62e-03±9.62e-03	5.39e-03±9.33e-03
3.0-4.0	3.48	-0.01	-0.33	-1.80e-03±4.34e-03	-9.66e-04±4.26e-03
4.0-5.0	4.42	-0.01	-0.29	-4.72e-03±5.99e-03	-4.91e-03±5.93e-03
5.0-6.0	5.42	-0.01	-0.27	-1.07e-02±1.00e-02	-1.07e-02±1.02e-02
6.0-7.0	6.42	-0.02	-0.25	-2.29e-02±1.66e-02	-1.77e-02±1.69e-02
7.0-8.0	7.43	-0.02	-0.24	4.01e-02±2.61e-02	3.87e-02±2.75e-02
8.0-9.0	8.44	-0.02	-0.23	-3.95e-02±4.20e-02	5.89e-02±1.29e-01
9.0-10.0	9.45	-0.02	-0.22	-	-
10.0-12.0	10.82	-0.02	-0.21	-	-

ERT4x4(AC)-BBCLL1, η, $x_F < -0.01$, Inclusive pseudorapidity					
p_T Bin	$\langle p_T \rangle$	$\langle x_F \rangle$	$\langle \eta \rangle$	$A_{N,sqrt}$	$A_{N,lumi}$
2.0-3.0	2.80	-0.01	-0.37	2.03e-02±1.25e-01	-1.24e-02±1.27e-01
3.0-4.0	3.50	-0.01	-0.32	1.56e-02±3.08e-02	9.55e-03±3.03e-02
4.0-5.0	4.44	-0.01	-0.28	-5.01e-02±3.08e-02	-4.42e-02±3.04e-02
5.0-6.0	5.42	-0.01	-0.25	1.26e-02±4.12e-02	9.14e-03±4.24e-02
6.0-7.0	6.43	-0.02	-0.24	7.12e-02±6.55e-02	1.81e-02±1.17e-01
7.0-8.0	7.43	-0.02	-0.23	-	-
8.0-12.0	9.21	-0.02	-0.22	-	-

ERT4x4(AC)-BBCLL1, π^0, $x_F > 0.01$, Inclusive pseudorapidity					
p_T Bin	$\langle p_T \rangle$	$\langle x_F \rangle$	$\langle \eta \rangle$	$A_{N,sqrt}$	$A_{N,lumi}$
1.0-2.0	-	-	-	-	-
2.0-3.0	2.82	0.01	0.37	9.27e-03±9.41e-03	8.67e-03±9.07e-03
3.0-4.0	3.48	0.01	0.33	2.32e-03±4.27e-03	2.67e-03±4.17e-03
4.0-5.0	4.42	0.01	0.29	6.21e-03±5.86e-03	4.27e-03±5.79e-03
5.0-6.0	5.42	0.01	0.27	5.66e-03±9.74e-03	8.50e-03±9.79e-03
6.0-7.0	6.42	0.02	0.25	-2.04e-02±1.61e-02	-2.62e-02±1.63e-02
7.0-8.0	7.43	0.02	0.24	-5.10e-02±2.55e-02	-7.68e-02±2.66e-02
8.0-9.0	8.44	0.02	0.23	-1.91e-02±4.04e-02	-1.78e-02±1.10e-01
9.0-10.0	9.45	0.02	0.22	-	-
10.0-12.0	10.82	0.02	0.21	-	-

ERT4x4(AC)-BBCLL1, η, $x_F > 0.01$, Inclusive pseudorapidity					
p_T Bin	$\langle p_T \rangle$	$\langle x_F \rangle$	$\langle \eta \rangle$	$A_{N,sqrt}$	$A_{N,lumi}$
2.0-3.0	2.80	0.01	0.37	-1.44e-01±1.21e-01	-1.44e-01±1.21e-01
3.0-4.0	3.50	0.01	0.32	-5.73e-02±3.02e-02	-6.20e-02±2.95e-02
4.0-5.0	4.44	0.01	0.28	-6.96e-04±3.01e-02	-6.90e-03±2.96e-02
5.0-6.0	5.42	0.01	0.25	3.66e-02±4.02e-02	3.55e-02±4.12e-02
6.0-7.0	6.43	0.02	0.24	-1.31e-02±6.33e-02	1.37e-01±1.00e-01
7.0-8.0	7.43	0.02	0.23	-	-
8.0-12.0	9.21	0.02	0.22	-	-

4 Comparison to previous results

The present analysis (AN864) is compared to existing π^0 and η analyses. No previous central arm spin analysis has binned in x_F or pseudorapidity, so comparison can only be done for inclusive kinematic cuts.

The π^0 analysis is compared to PPG050, AN567 and AN602. The present analysis is an updated A_N analysis to PPG050. However, PPG050 used the Run02/ERT2x2 dataset while the present analysis uses the Run08/ERT4x4(A||C) dataset. Therefore, a comparison with less triggering uncertainty can be done to AN602 and AN567 which are Run06/ERT4x4(A||C) and Run05/ERT4x4(A||C) based analyses of the π^0 cross section and double longitudinal spin asymmetry. AN602 was a preliminary analysis with no ToF cut and an energy asymmetry cut on the pair (similar to this analysis) while AN567 uses ToF-based photon cuts and no energy asymmetry cut. The η analysis is compared to AN649, a Run06/ERT4x4(A||C) based A_{LL} analysis with the particle identification cuts similar to the present analysis.

4.1 $k_{enhance}$

Comparison of the background contaminations are given in section 3.4.4. AN602 does not list its $k_{enhance}$ factors so comparison is only done to the AN567 instead. Readers should remember that the particle identification cuts differ between AN567 and the present work.

4.2 Background contamination

Comparison is done between previous analyses and the present work for r, the Background/(Signal+Background) ratio.

	π^0 r Comparison		
p_T bin	r^{AN567}	r^{AN602}	r^{AN864}
0.5-0.75	0.814	-	-
0.75-1	0.577	-	-
1-1.5	0.373	0.436	0.332
1.5-2	0.261	0.266	-
2-2.5	0.175	0.158	0.151
2.5-3	0.127	0.100	-
3-3.5	0.102	0.071	0.0734
3.5-4	0.089	0.057	-
4-5	0.084	0.051	0.0558
5-6	0.081	0.048	0.0513
6-7	0.081	0.049	0.0555
7-9	0.079	0.047	-
7-8	-	-	0.0578
8-9	-	-	0.582
9-10	-	-	0.0538
10-12	-	-	0.0513

Table 5: r value comparison between AN567, AN602 and present analysis. AN567 and AN 602 taken from r values taken from tables 6 and 3 in the respective analysis notes.

	η r Comparison		
p_T bin	r_{even}^{AN649}	r_{odd}^{AN649}	r^{AN864}
2-3	0.777	0.777	0.77
3-4	0.572	0.572	0.58
4-5	0.464	0.472	0.482
5-6	0.426	0.432	0.435
6-7	0.413	0.403	0.428
7-9	0.417	0.406	-
7-8	-	-	0.374
8-12	-	-	0.399

Table 6: r value comparison between AN567 and present analysis. AN567 r values taken from table 2, page 15

4.3 Yields

In this section I compare the yield of π^0's to previous analyses. An important point to remember is that the "official" integrated luminosities for each run do not include analysis dependent bad run lists. Often the integrated luminosity actually used in analysis can be quite different. I don't have a firm number for the integrated luminosity sampled by previous analyses, so I summarize my estimates of the integrated luminosities used by each analysis in table 7.

Analysis	NTrigger$_{Live}$
AN293[1]	8.95 $\times 10^8$
AN602	1.23 $\times 10^{11}$
AN864	9.97 $\times 10^{10}$

Table 7: Number of live $BBCLL1(> 0tubes)$ triggers for each π^0 analysis. The number for AN293 is only an estimate. Good run lists for AN293 and AN602 are not exact but are close to the lists used for analysis.

The comparison between the yields are done in two ways. Comparison to AN293 is done using the statistical error on the asymmetries, while, for AN602, the yields are used. Assuming polarization of 15% and 46% for runs 02 and 08 respectively, the ratio of error bars is expected to be: 34.2. In addition, for the run 02 analysis, I have no knowledge of the warnmaps used in the analysis, the percentage of the ERT trigger which was active, etc. The factor of 34 is only a rough estimate. The run02,run08 comparison is shown in table 4.3. In contrast to the run02 case, comparison to the

p_T bin	PPG050/Run02 $A_N^{\pi^0}$	AN864/Run08 $A_{N,sqrt}^{\pi^0}$	Ratio of errors
1-2	-0.005 ± 0.012	8.00e-04±6.29e-04	19.1
2-3	-0.012 ± 0.020	6.19e-04±5.63e-04	35.5
3-4	-0.016 ± 0.047	2.20e-04±1.05e-03	45.2
4-5	0.052 ± 0.109	1.35e-03±2.23e-03	49.1

run06 yields is much simpler. The two analyses used the same trigger and similar warnmaps. The present analysis masks 31% of the EMC towers while AN602 masked 24% of the towers. Therefore, the expected yields are expected to differ by a factor of 1.35. The run06,run08 comparison is shown in table 4.3.

The fourth column of 4.3 shows the consistency of the yields between the two datasets by forming their ratio. The low p_T yields are not expected to scale like the high

[1]The standard integrated luminosity for run02 is 0.15 pb^{-1}, but I don't know which runs contribute to the figure. There is at least a factor of two difference between the number of runs marked as PHYSICS in the daq database and the run list provided in AN293. I tried retrieving the number of live $BBCLL1(> 0tubes)$ triggers using the good run list provided in AN293, but for run02 there was no such trigger. Instead, I looked for a suitable trigger to provide a link between integrated luminosities between AN293 and the present analysis. I found a trigger named "$BBCLL1 >= 1(noVertexCut)$" in the daq database. The summed total number of live triggers for this trigger in run02 was: 1.79e9. Based on the name, this trigger made no vertex cut and the number of triggers can be roughly translated to a +/- 30 cm vertex cut trigger by dividing by two.

p_T bin	$Yield^{AN602}$	$Yield^{AN864}$	$\frac{Yield^{AN602}}{Yield^{AN864}}$	$\delta A_{N,projection}$	$\delta A_{N,measured}$	$\frac{\delta A_{N,projection}}{\delta A_{N,measured}}$
1-2	4.43 e+7	2.53 e+7	1.75	5.5e-4	6.28e-4	0.87
2-3	2.50 e+7	1.64 e+7	1.52	5.1e-4	5.62e-4	0.92
3-4	5.11 e+6	3.60 e+6	1.42	9.9e-4	1.05e-3	0.94
4-5	1.01 e+6	7.51 e+5	1.35	2.1e-3	2.23e-3	0.95
5-6	2.50 e+5	1.87 e+5	1.34	4.2e-3	4.44e-3	0.95
6-7	7.63 e+4	5.65 e+4	1.35	7.7e-3	8.07e-3	0.95
7-9	3.94 e+4	2.88 e+4	1.37	-	-	-
9-12	9.09 e+3	7.02 e+3	1.30	-	-	-

Table 8: Adapted yields from AN602 table 3 and this analysis for mass window 112 to 162 MeV and associated values which are explained in the text.

p_T yields since the present analysis uses a 200 MeV rather than a 100 MeV minimum photon energy in the PbSc. The fifth column shows the projected error bar of A_N given the run08 yields, a mean polarization of 46% and the signal background ratios given in table 1. The projected error is calculated as: $\delta A_{N,projection} = \frac{k_{enhance}}{0.9P(1-r)\sqrt{2N}}$ The factor of 0.9 approximates the $\langle|cos(\phi)\rangle$ term and the factor of two is takes into account the fact that a single particle is used for blue and yellow analysis. The projected error can be compared to the sixth column which shows the measured square root asymmetry error bar. Finally, the ratio of the projected over the measured error bar is shown in the seventh and final column. The non-constant ratio may be due to different $\langle|cos(\phi)\rangle$ terms between p_T bins.

5 Bunch shuffling

The asymmetry analysis is repeated one thousand times but the spins of filled bunches are assigned randomly. Two checks are performed for each asymmetry. The first is done by filling a histogram of $\frac{A_{shuffle}}{\delta A_{physics}}$ which is expected to fit a Gaussian distribution centered at zero with width one. The second check aggregates the $\chi^2_{reduced}$ values and compares the observed distribution with the expected distribution. The raw distributions and fits are available in html format at: `https://www.phenix.bnl.gov/WWW/p/draft/jkoster4/analysis/an864/shuffle_html/shuffle.html`

Summary plots have been prepared of the two cross-checks. The plots always come in a triplet with the left and middle plots showing the Gaussian fit mean and Gaussian fit width, and the right plot showing the mean of the reduced χ^2 distribution.

5.1 Inclusive

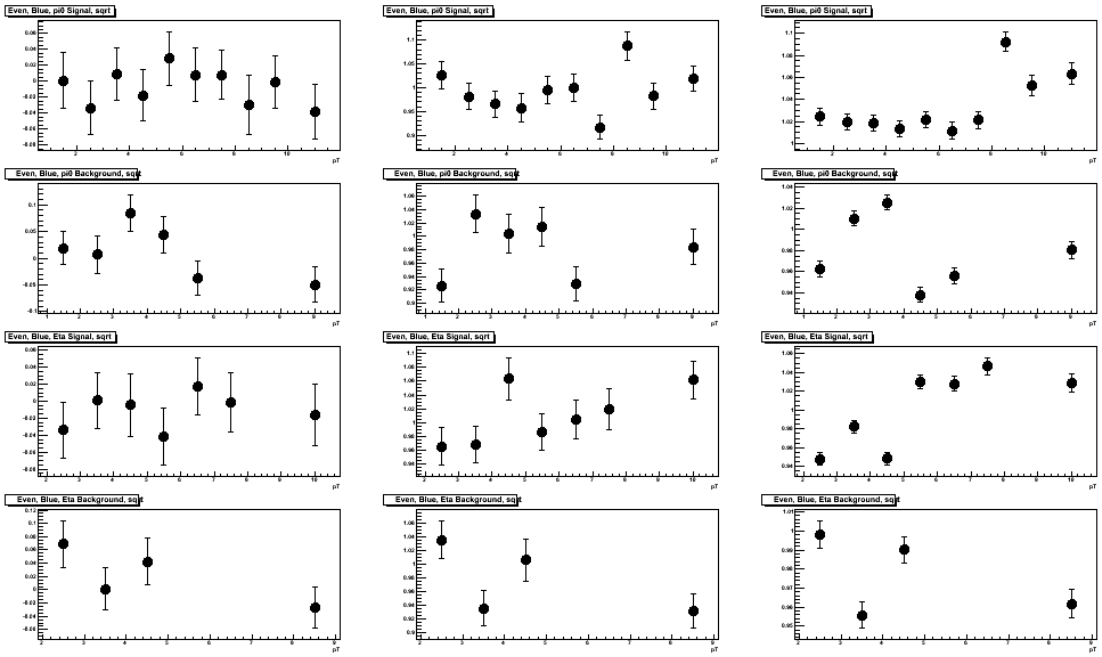

Figure 17: Inclusive, Even crossings, Blue beam, Square root formula. See text for explanation of right, middle and left panels. Top to bottom are π^0 peak mass window, π^0 background mass window, η peak mass window and η background mass window.

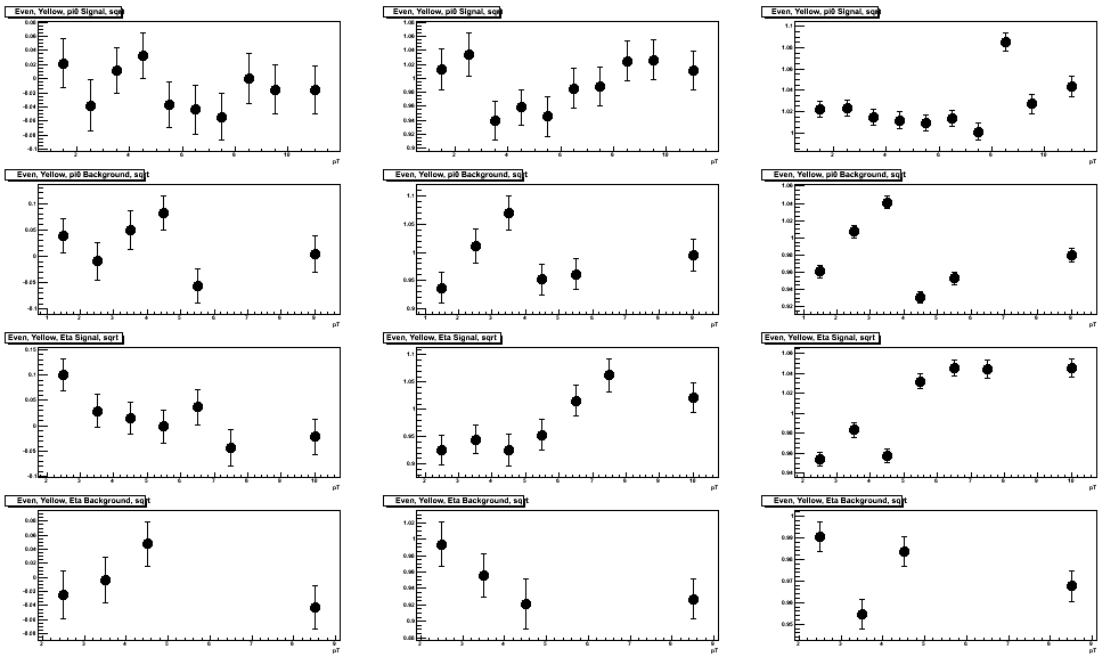

Figure 18: Inclusive, Even crossings, Yellow beam, Square root formula. See text for explanation of right, middle and left panels. Top to bottom are π^0 peak mass window, π^0 background mass window, η peak mass window and η background mass window.

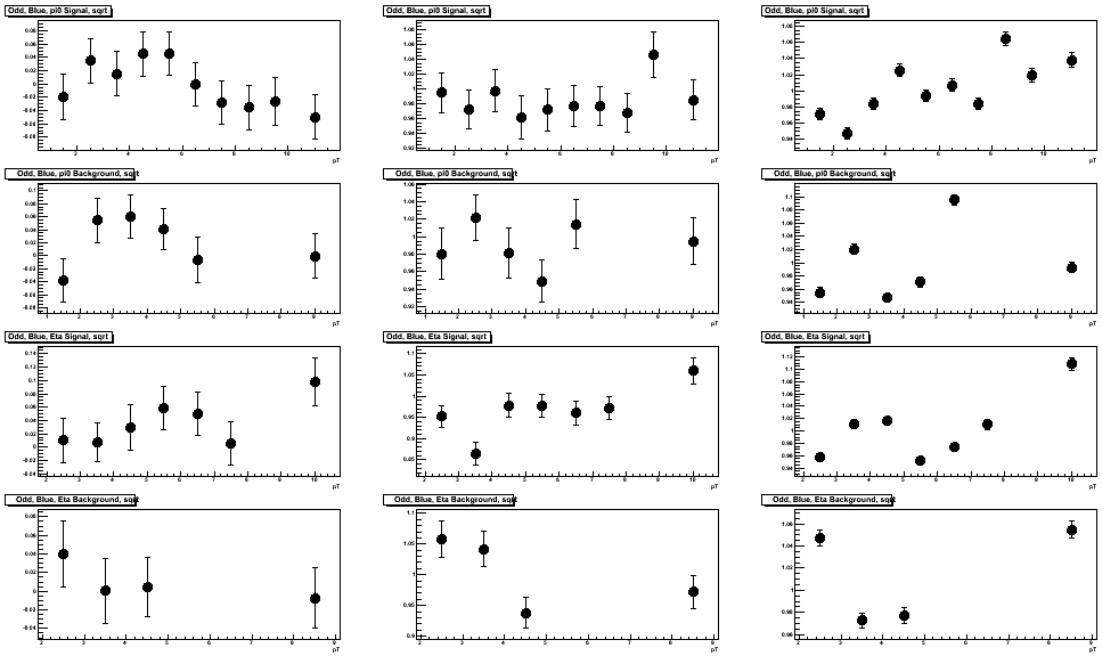

Figure 19: Inclusive, Odd crossings, Blue beam, Square root formula. See text for explanation of right, middle and left panels. Top to bottom are π^0 peak mass window, π^0 background mass window, η peak mass window and η background mass window.

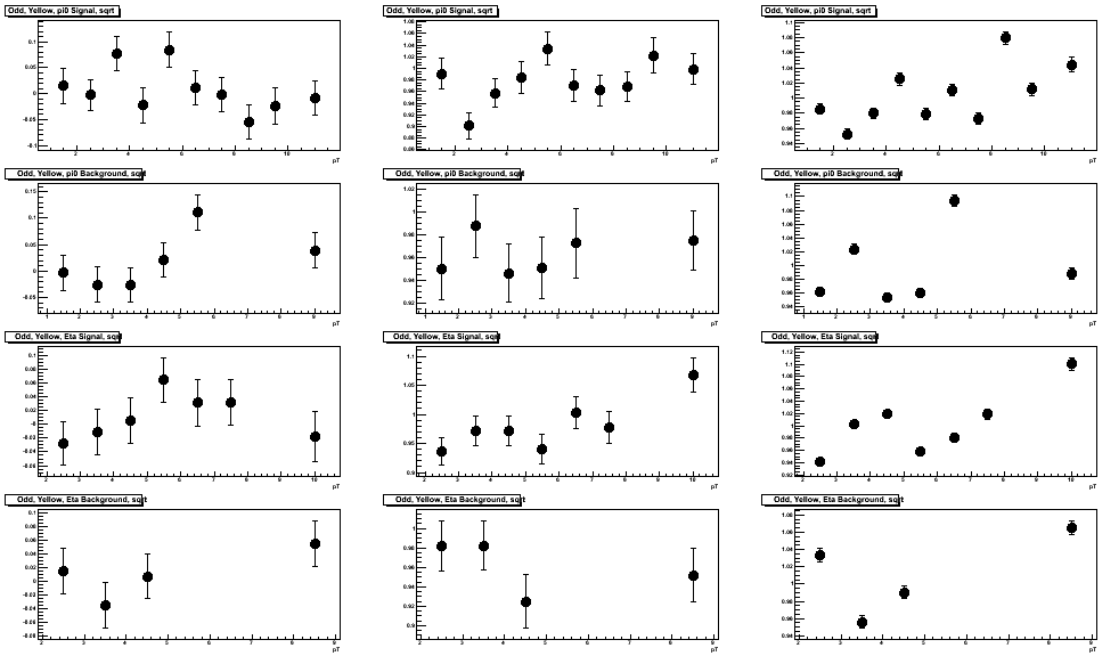

Figure 20: Inclusive, Odd crossings, Yellow beam, Square root formula. See text for explanation of right, middle and left panels. Top to bottom are π^0 peak mass window, π^0 background mass window, η peak mass window and η background mass window.

5.2 Backward x_F

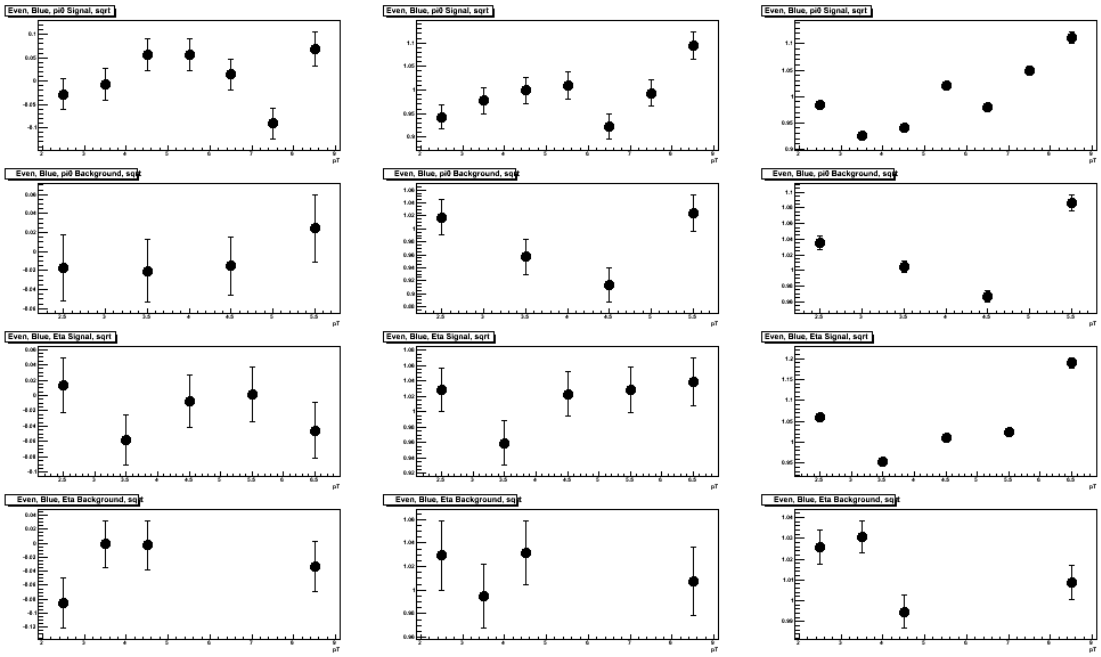

Figure 21: $x_F < -0.01$, Even crossings, Blue beam, Square root formula. See text for explanation of right, middle and left panels. Top to bottom are π^0 peak mass window, π^0 background mass window, η peak mass window and η background mass window.

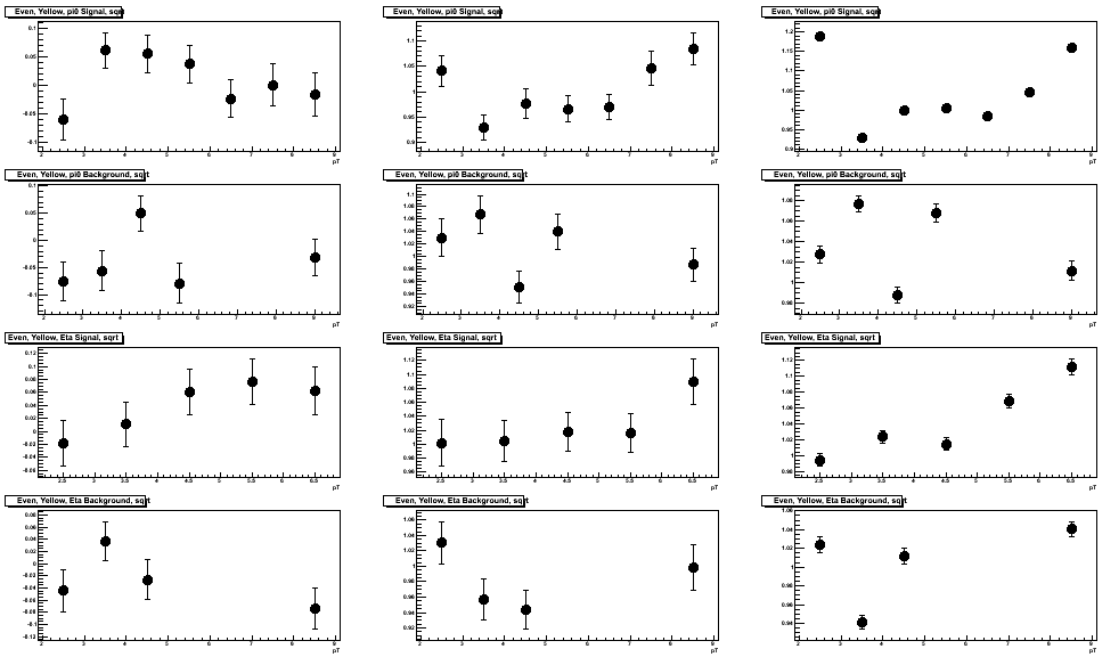

Figure 22: $x_F < -0.01$, Even crossings, Yellow beam, Square root formula. See text for explanation of right, middle and left panels. Top to bottom are π^0 peak mass window, π^0 background mass window, η peak mass window and η background mass window.

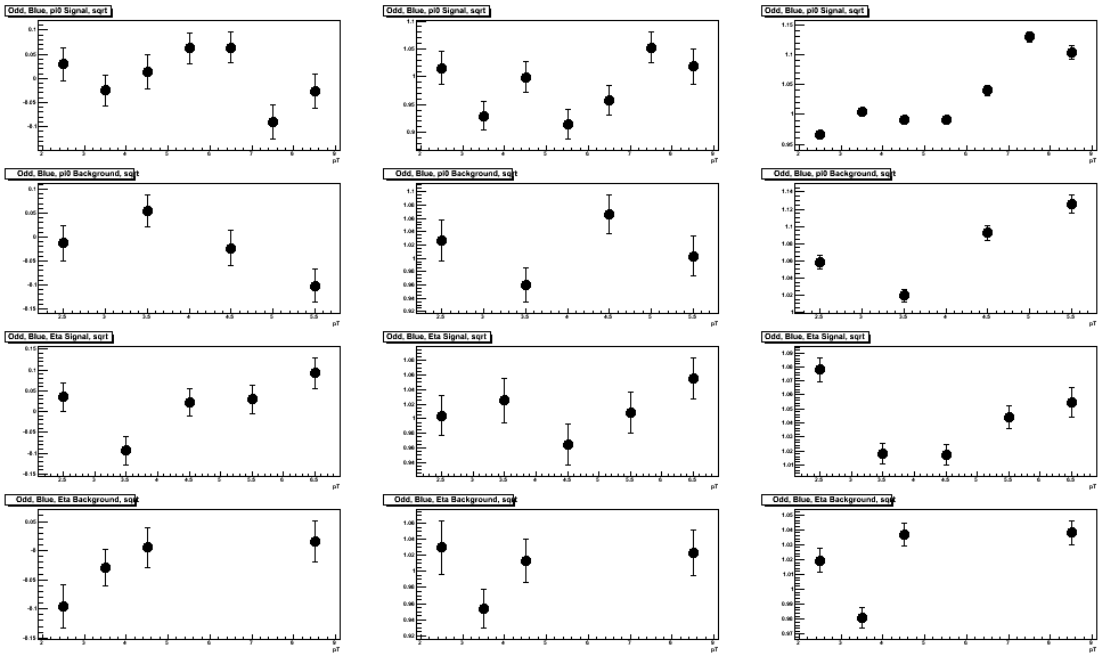

Figure 23: $x_F < -0.01$, Odd crossings, Blue beam, Square root formula. See text for explanation of right, middle and left panels. Top to bottom are π^0 peak mass window, π^0 background mass window, η peak mass window and η background mass window.

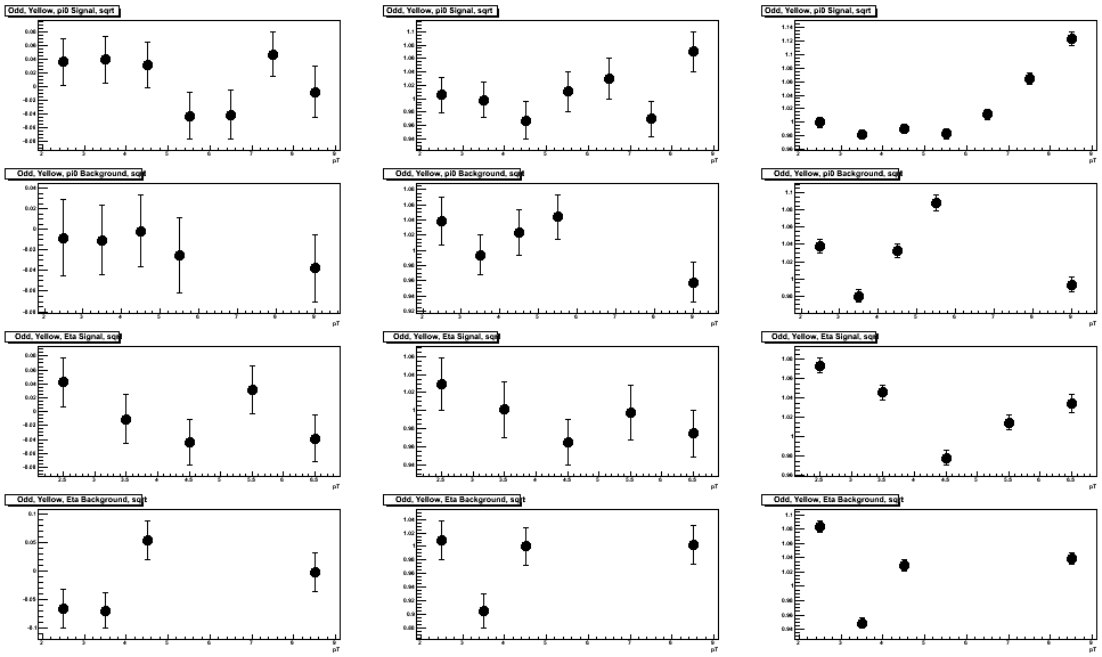

Figure 24: $x_F < -0.01$, Odd crossings, Yellow beam, Square root formula. See text for explanation of right, middle and left panels. Top to bottom are π^0 peak mass window, π^0 background mass window, η peak mass window and η background mass window.

5.3 Forward x_F

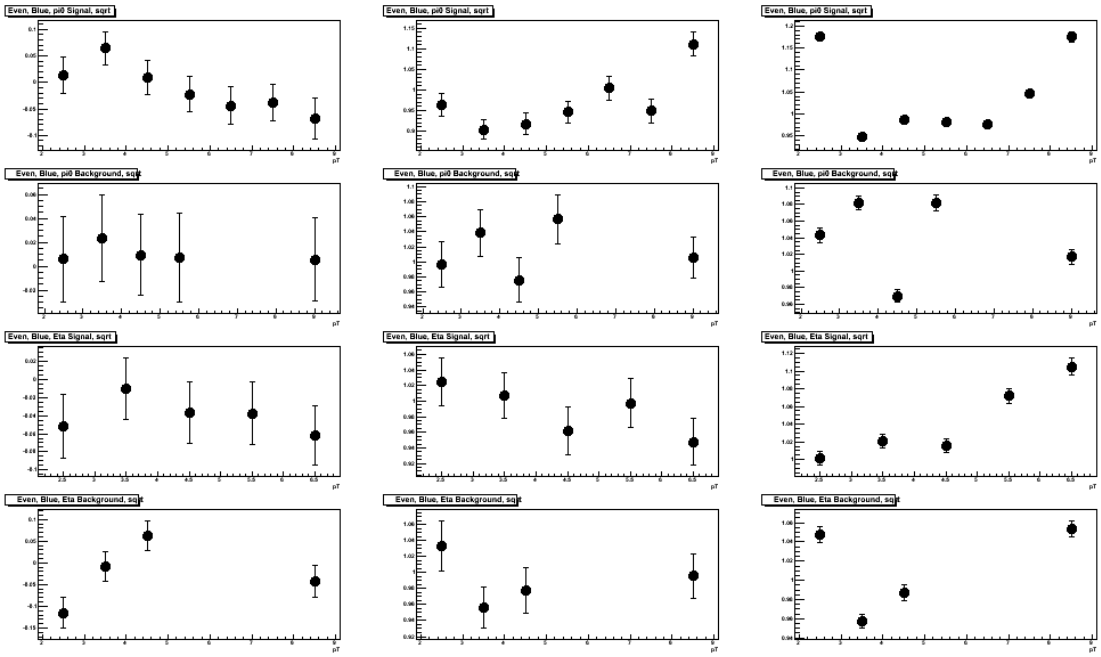

Figure 25: $x_F > 0.01$, Even crossings, Blue beam, Square root formula. See text for explanation of right, middle and left panels. Top to bottom are π^0 peak mass window, π^0 background mass window, η peak mass window and η background mass window.

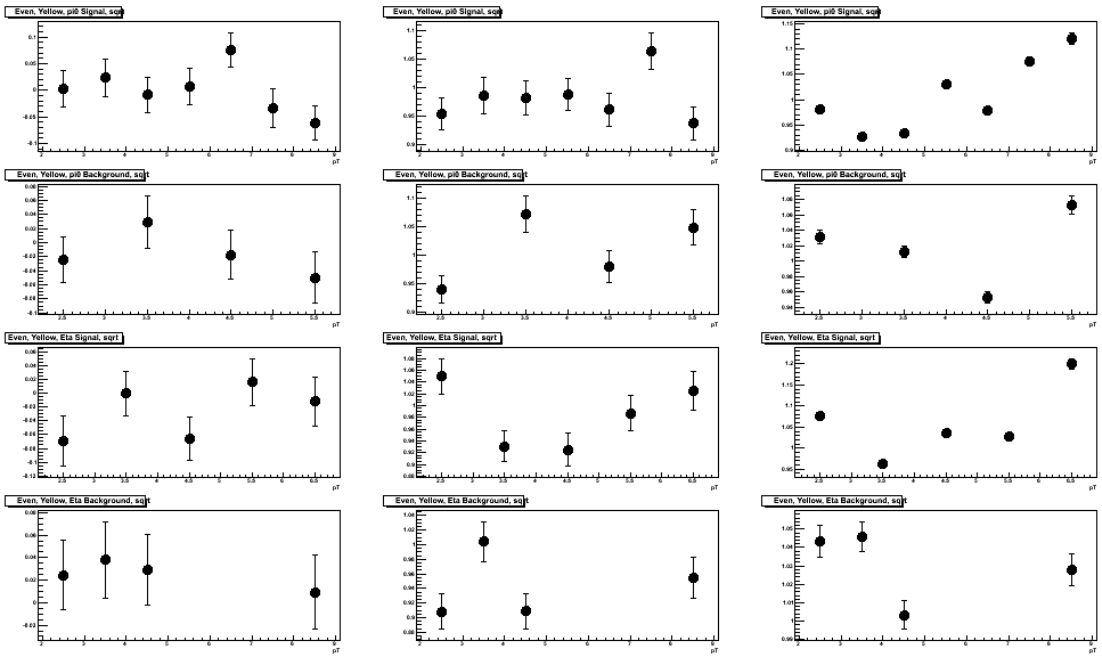

Figure 26: $x_F > 0.01$, Even crossings, Yellow beam, Square root formula. See text for explanation of right, middle and left panels. Top to bottom are π^0 peak mass window, π^0 background mass window, η peak mass window and η background mass window.

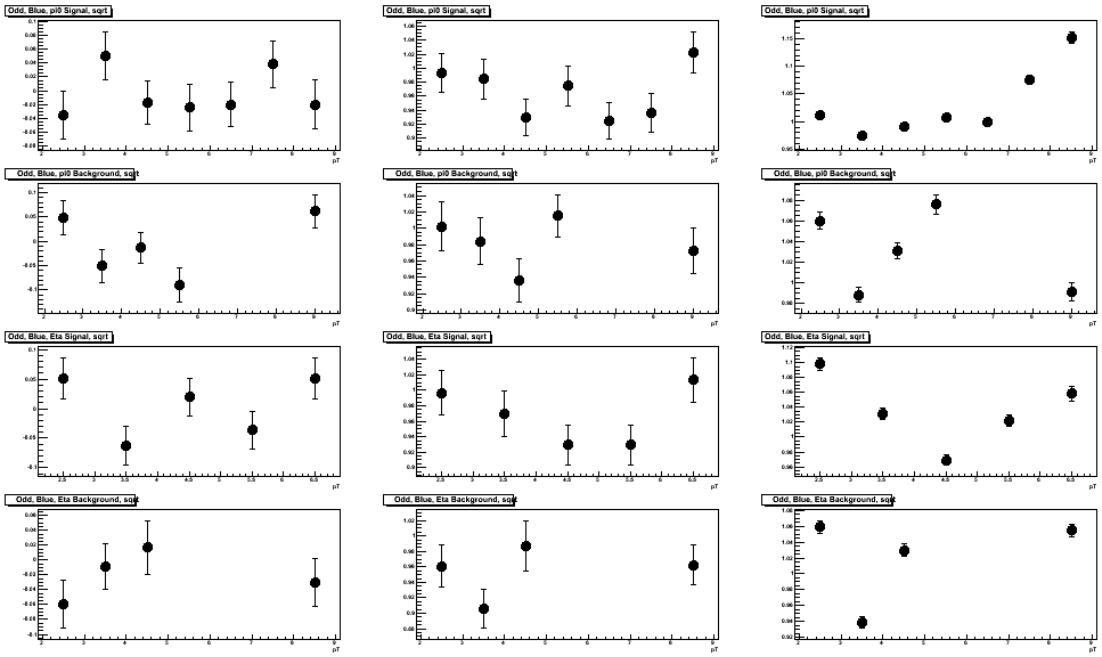

Figure 27: $x_F > 0.01$, Odd crossings, Blue beam, Square root formula. See text for explanation of right, middle and left panels. Top to bottom are π^0 peak mass window, π^0 background mass window, η peak mass window and η background mass window.

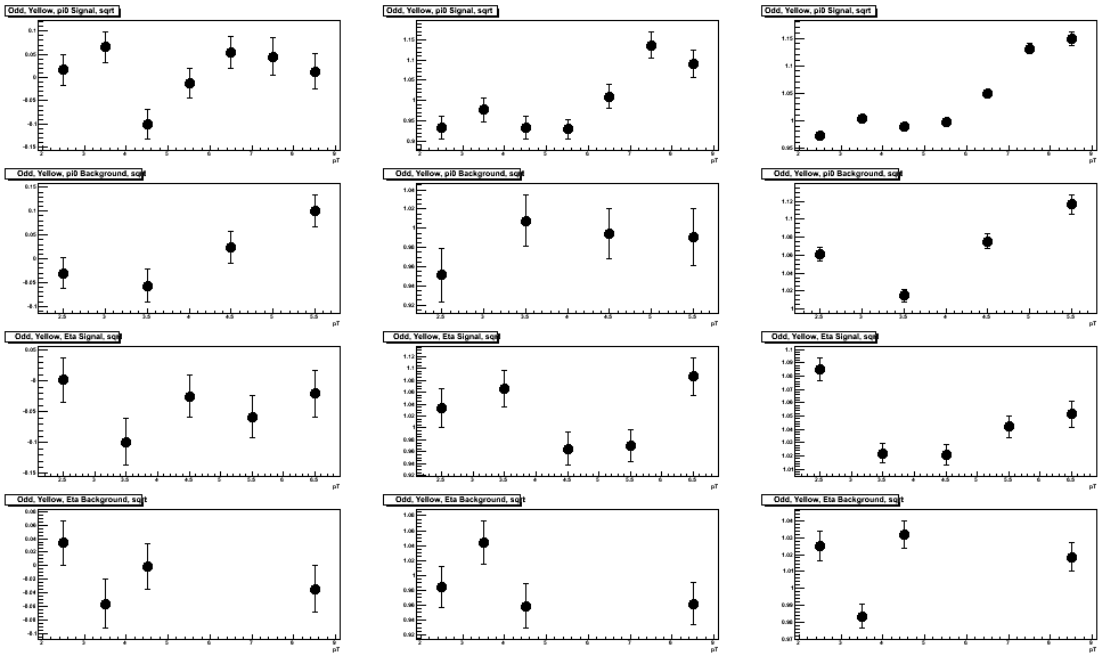

Figure 28: $x_F > 0.01$, Odd crossings, Yellow beam, Square root formula. See text for explanation of right, middle and left panels. Top to bottom are π^0 peak mass window, π^0 background mass window, η peak mass window and η background mass window.

5.4 Backward η

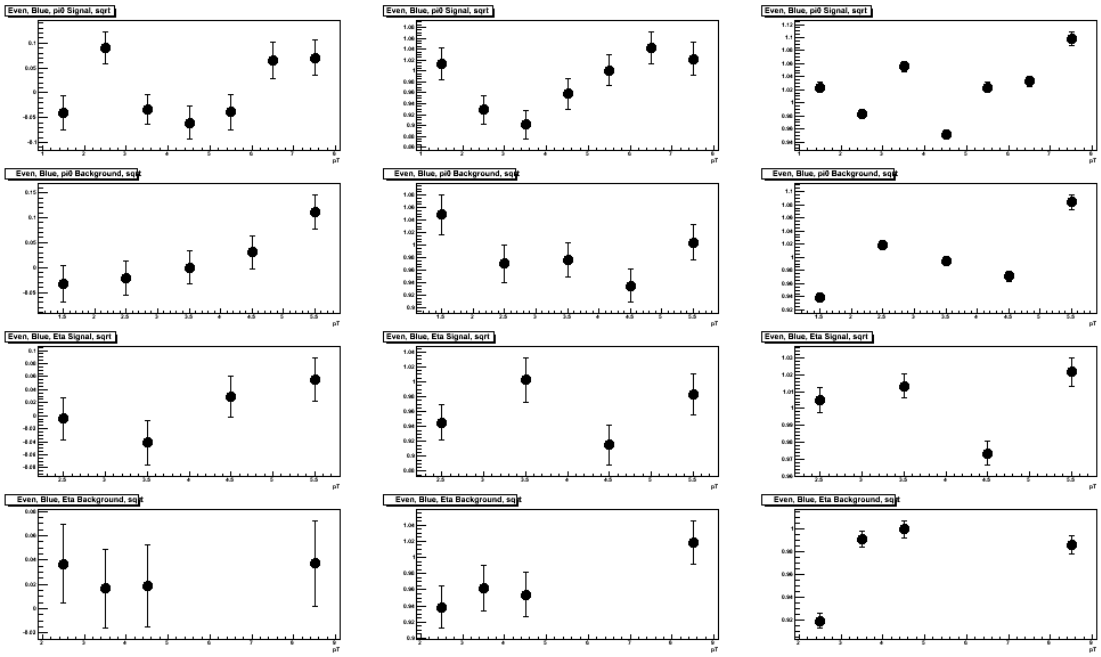

Figure 29: $\eta < -0.2$, Even crossings, Blue beam, Square root formula. See text for explanation of right, middle and left panels. Top to bottom are π^0 peak mass window, π^0 background mass window, η peak mass window and η background mass window.

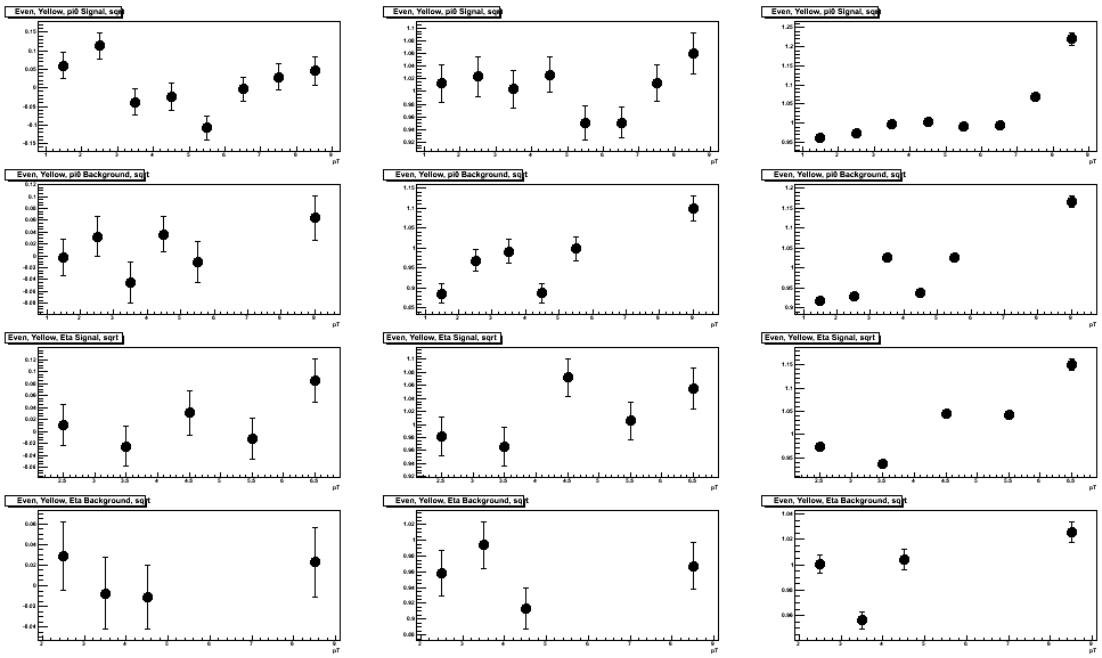

Figure 30: $\eta < -0.2$, Even crossings, Yellow beam, Square root formula. See text for explanation of right, middle and left panels. Top to bottom are π^0 peak mass window, π^0 background mass window, η peak mass window and η background mass window.

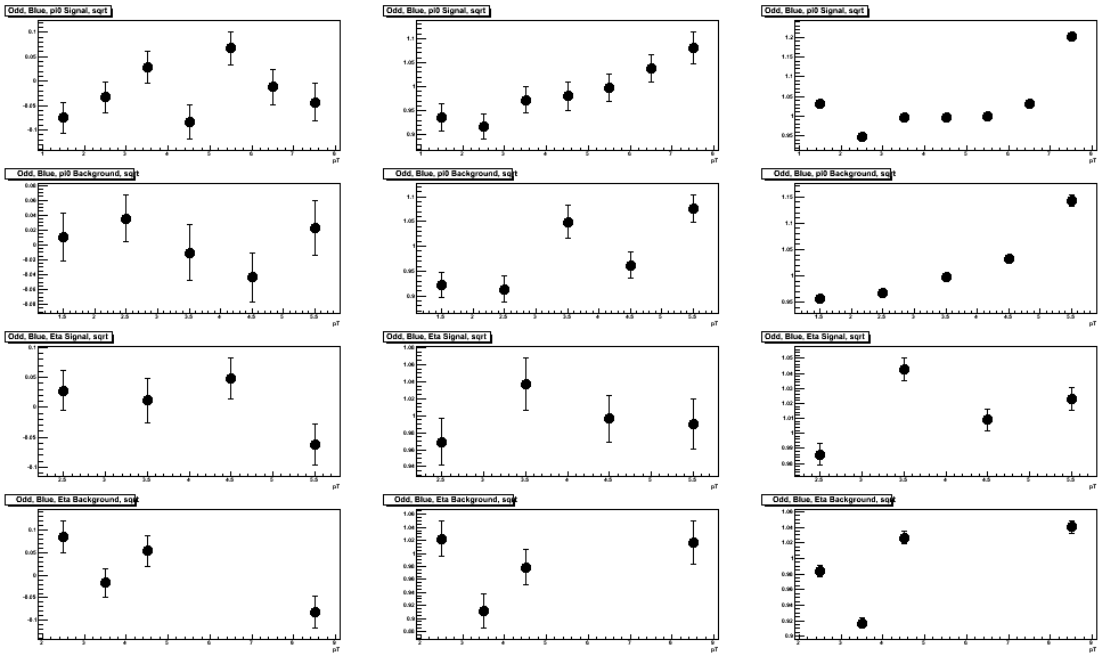

Figure 31: $\eta < -0.2$, Odd crossings, Blue beam, Square root formula. See text for explanation of right, middle and left panels. Top to bottom are π^0 peak mass window, π^0 background mass window, η peak mass window and η background mass window.

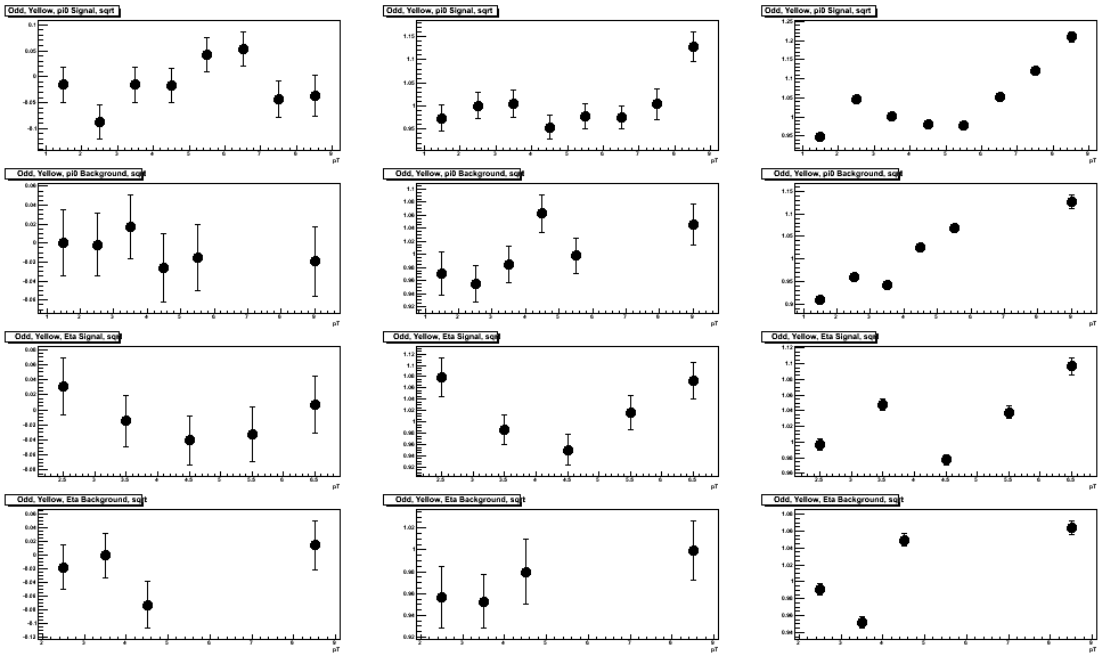

Figure 32: $\eta < -0.2$, Odd crossings, Yellow beam, Square root formula. See text for explanation of right, middle and left panels. Top to bottom are π^0 peak mass window, π^0 background mass window, η peak mass window and η background mass window.

5.5 Forward η

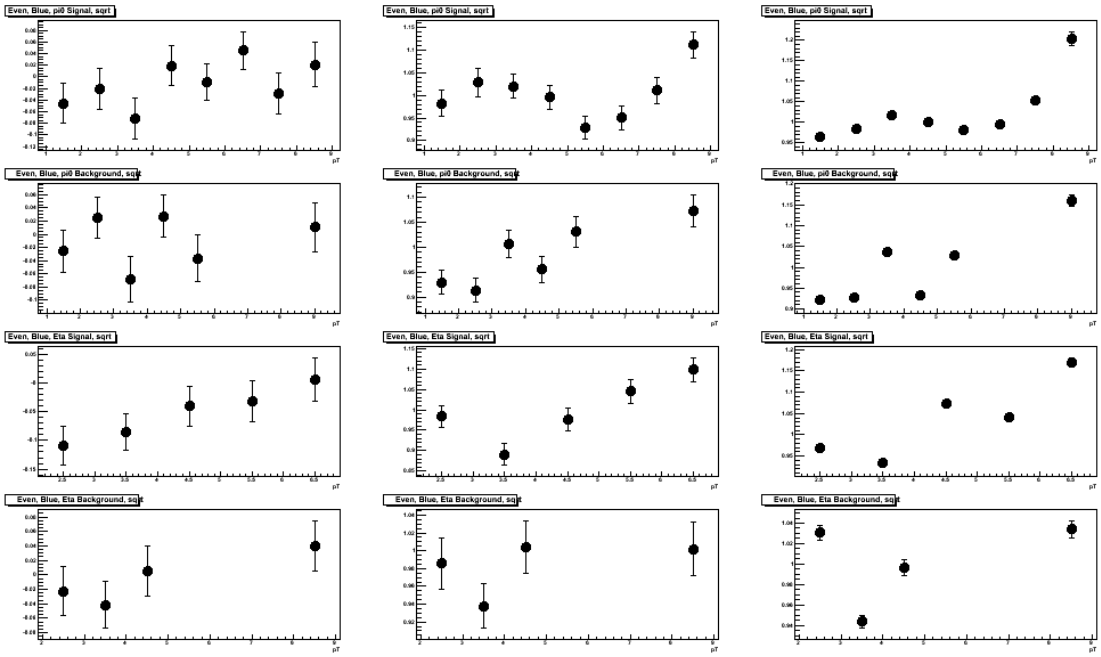

Figure 33: $\eta > 0.2$, Even crossings, Blue beam, Square root formula. See text for explanation of right, middle and left panels. Top to bottom are π^0 peak mass window, π^0 background mass window, η peak mass window and η background mass window.

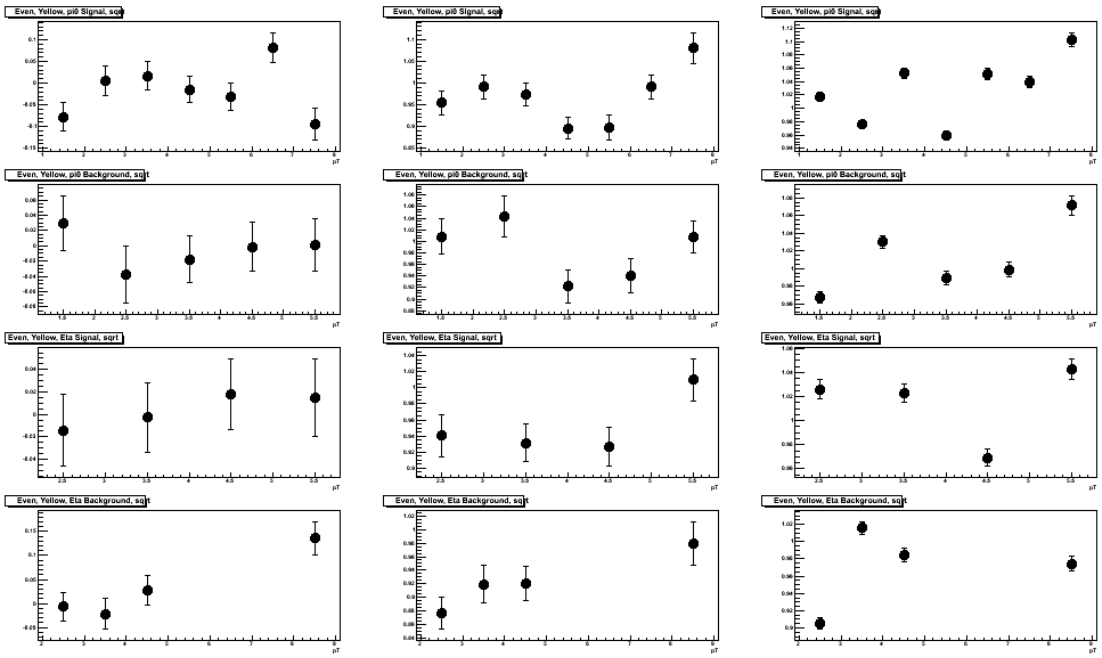

Figure 34: $\eta > 0.2$, Even crossings, Yellow beam, Square root formula. See text for explanation of right, middle and left panels. Top to bottom are π^0 peak mass window, π^0 background mass window, η peak mass window and η background mass window.

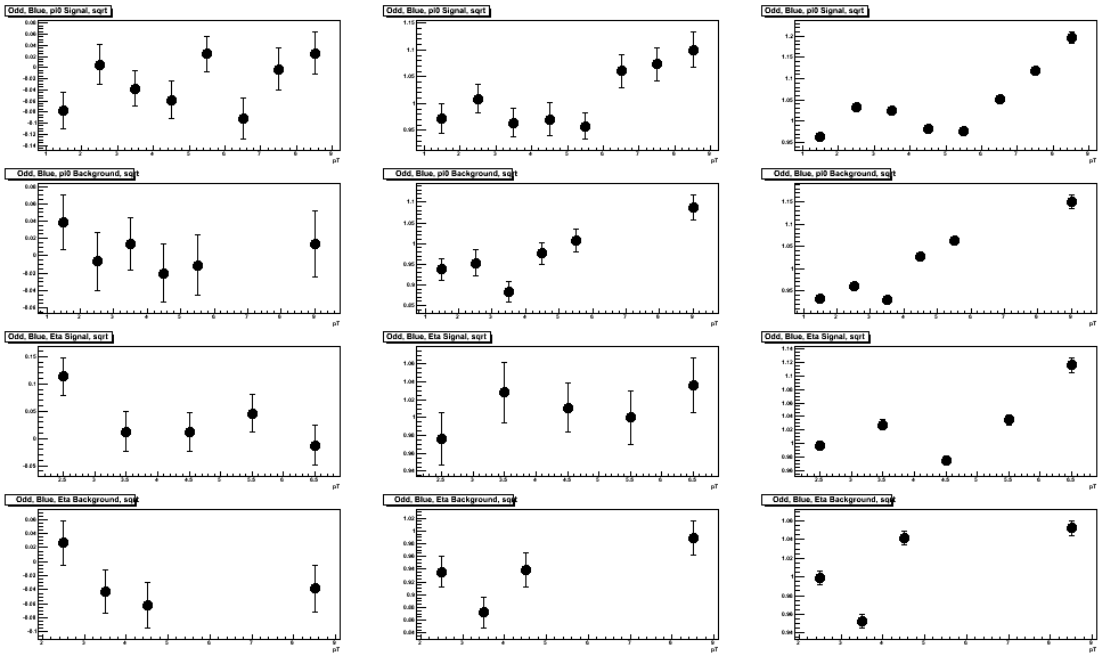

Figure 35: $\eta > 0.2$, Odd crossings, Blue beam, Square root formula. See text for explanation of right, middle and left panels. Top to bottom are π^0 peak mass window, π^0 background mass window, η peak mass window and η background mass window.

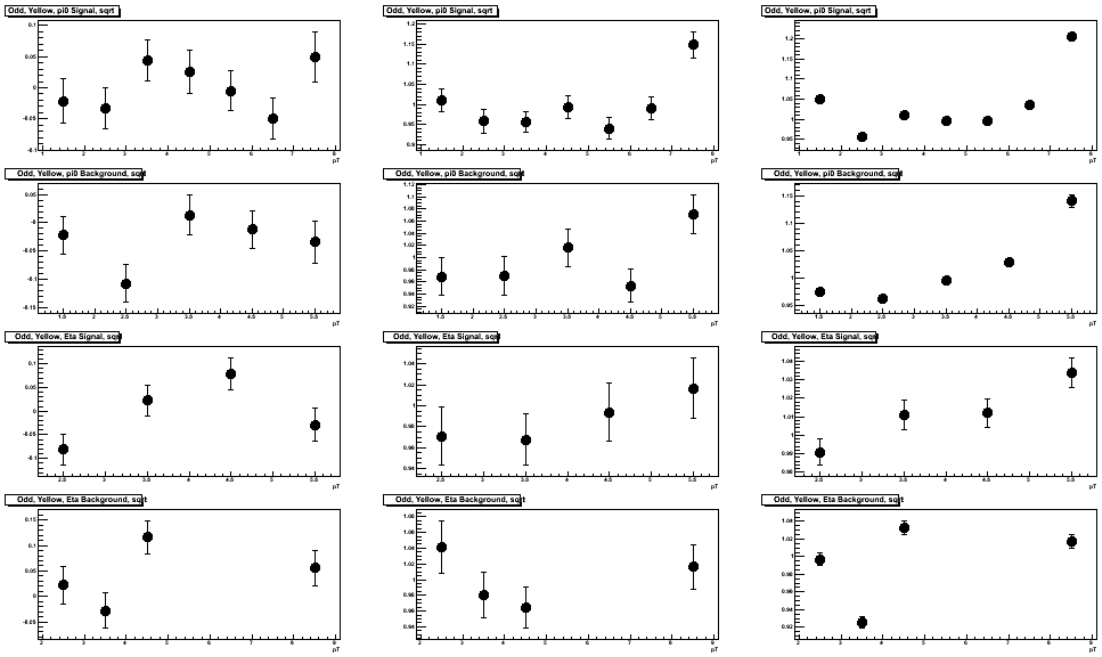

Figure 36: $\eta > 0.2$, Odd crossings, Yellow beam, Square root formula. See text for explanation of right, middle and left panels. Top to bottom are π^0 peak mass window, π^0 background mass window, η peak mass window and η background mass window.

A EMC warnmap

Kenichi's representations of his warnmap are given in figures 37 and 38.

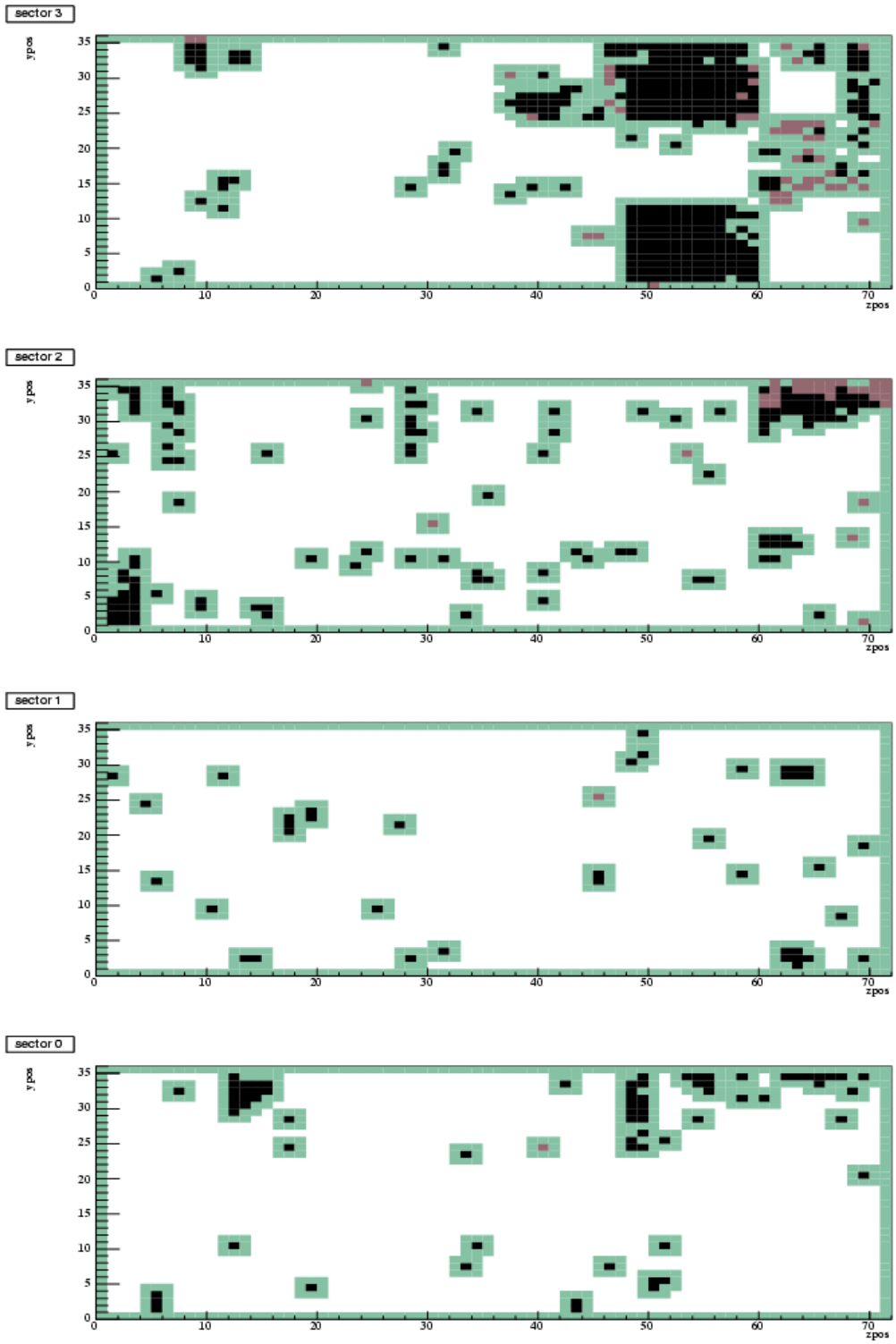

Figure 37: EMC Warnmap for the west arm

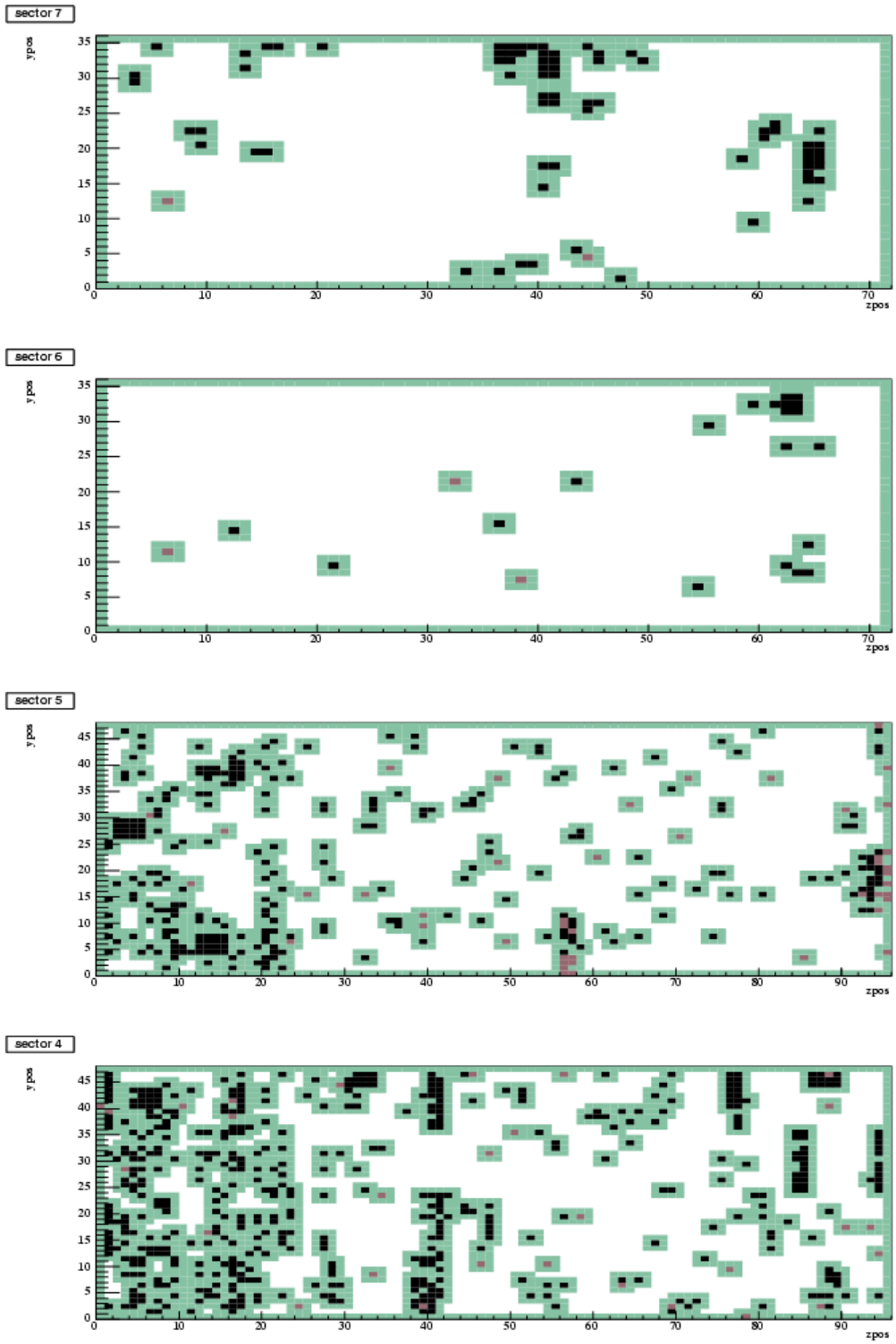

Figure 38: EMC Warnmap for the east arm

B Raw A_N fits against fill

B.1 Inclusive

ERT4x4(AC)-BBCLL1, Even, Inclusive x_F, Inclusive pseudorapidity, pi0 Signal, sqrt, Blue			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
1 - 2	24.5235 / 37	0.00111419	0.000731231
2 - 3	45.0945 / 37	0.00132556	0.000868524
3 - 4	47.1904 / 37	0.000629701	0.00180393
4 - 5	48.0392 / 37	0.001164	0.00392516
5 - 6	54.0213 / 37	0.000529648	0.00784421
6 - 7	45.7114 / 36	-0.0142297	0.0143093
7 - 8	52.1881 / 34	0.00487249	0.0238814
8 - 9	38.7279 / 32	-0.0433909	0.0370865
9 - 10	34.5344 / 28	0.0131233	0.0545368
10 - 12	37.8192 / 27	0.0833691	0.0649043

ERT4x4(AC)-BBCLL1, Even, Inclusive x_F, Inclusive pseudorapidity, pi0 Signal, sqrt, Yellow			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
1 - 2	43.0953 / 37	0.000721846	0.000857696
2 - 3	31.1979 / 37	0.000729023	0.00101716
3 - 4	34.1934 / 37	-0.00084865	0.00210763
4 - 5	44.9777 / 37	0.00626624	0.00458098
5 - 6	25.9234 / 37	-0.00663932	0.00914844
6 - 7	42.4269 / 36	-0.00908366	0.0167052
7 - 8	28.5686 / 34	0.0117513	0.027948
8 - 9	26.5899 / 32	0.0173104	0.0434628
9 - 10	36.1003 / 28	0.0527166	0.0635226
10 - 12	24.0518 / 27	-0.0694294	0.0768228

ERT4x4(AC)-BBCLL1, Even, Inclusive x_F, Inclusive pseudorapidity, pi0 Signal, lumi, Blue			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
1 - 2	23.3385 / 37	0.00114581	0.000730031
2 - 3	44.0797 / 37	0.00130913	0.000866507
3 - 4	46.7316 / 37	0.000659787	0.00180014
4 - 5	46.4739 / 37	0.0010707	0.00391714
5 - 6	53.604 / 37	0.000653131	0.00782696
6 - 7	37.7199 / 34	-0.0150594	0.0143068
7 - 8	51.6452 / 32	-0.000115956	0.0238993
8 - 9	40.0845 / 30	-0.0331446	0.037351
9 - 10	20.1825 / 21	-0.0187421	0.0640335
10 - 12	12.531 / 10	0.0886263	0.105022

ERT4x4(AC)-BBCLL1, Even, Inclusive x_F, Inclusive pseudorapidity, pi0 Signal, lumi, Yellow			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
1 - 2	42.8838 / 37	0.000713207	0.00085634

continued on next page

continued from previous page

2 - 3	30.641 / 37	0.000718454	0.00101491
3 - 4	33.3352 / 37	-0.000772902	0.00210336
4 - 5	44.0836 / 37	0.00631577	0.00457168
5 - 6	26.0836 / 37	-0.00659042	0.00912779
6 - 7	40.8781 / 34	-0.00804798	0.0166986
7 - 8	26.33 / 32	0.00839363	0.0278717
8 - 9	27.9544 / 30	0.0268833	0.0441132
9 - 10	30.1434 / 21	0.0786952	0.0746862
10 - 12	9.57419 / 10	-0.0788024	0.126317

ERT4x4(AC)-BBCLL1, Even, Inclusive x_F, Inclusive pseudorapidity, pi0 Background, sqrt, Blue

p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
1 - 2	37.3182 / 37	0.000919654	0.000988711
2 - 3	40.2625 / 37	0.00266452	0.00177959
3 - 4	34.3812 / 37	-0.00239	0.00538735
4 - 5	33.2107 / 37	0.00239365	0.0135532
5 - 6	25.4688 / 33	0.0132865	0.0285891
6 - 12	30.6601 / 30	-0.0442447	0.0429932
6 - 12	30.6601 / 30	-0.0442447	0.0429932
6 - 12	30.6601 / 30	-0.0442447	0.0429932
6 - 12	30.6601 / 30	-0.0442447	0.0429932
6 - 12	30.6601 / 30	-0.0442447	0.0429932

ERT4x4(AC)-BBCLL1, Even, Inclusive x_F, Inclusive pseudorapidity, pi0 Background, sqrt, Yellow

p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
1 - 2	26.6692 / 37	0.000757793	0.0011596
2 - 3	38.6522 / 37	0.00166012	0.00208299
3 - 4	59.4708 / 37	-0.00541116	0.00629222
4 - 5	48.4017 / 37	-0.0204406	0.0158187
5 - 6	31.4248 / 33	0.0178935	0.0333561
6 - 12	32.7378 / 30	0.0285547	0.0505623
6 - 12	32.7378 / 30	0.0285547	0.0505623
6 - 12	32.7378 / 30	0.0285547	0.0505623
6 - 12	32.7378 / 30	0.0285547	0.0505623
6 - 12	32.7378 / 30	0.0285547	0.0505623

ERT4x4(AC)-BBCLL1, Even, Inclusive x_F, Inclusive pseudorapidity, pi0 Background, lumi, Blue

p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
1 - 2	39.876 / 37	0.000957575	0.000986616
2 - 3	40.4275 / 37	0.00274997	0.00177742
3 - 4	34.1056 / 37	-0.00224261	0.0053841
4 - 5	31.9649 / 36	0.00268366	0.0135337

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5 - 6	31.3376 / 33	0.0183431	0.0284333
6 - 12	32.3264 / 29	-0.0406801	0.0428357
6 - 12	32.3264 / 29	-0.0406801	0.0428357
6 - 12	32.3264 / 29	-0.0406801	0.0428357
6 - 12	32.3264 / 29	-0.0406801	0.0428357
6 - 12	32.3264 / 29	-0.0406801	0.0428357

ERT4x4(AC)-BBCLL1, Even, Inclusive x_F, Inclusive pseudorapidity, pi0 Background, lumi, Yellow

p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
1 - 2	27.3868 / 37	0.000595922	0.00115718
2 - 3	38.6256 / 37	0.00169432	0.00208059
3 - 4	59.1624 / 37	-0.00559252	0.00628817
4 - 5	45.0807 / 36	-0.0195883	0.0157905
5 - 6	32.7074 / 33	0.0243473	0.0331884
6 - 12	27.9725 / 29	0.0467518	0.0504322
6 - 12	27.9725 / 29	0.0467518	0.0504322
6 - 12	27.9725 / 29	0.0467518	0.0504322
6 - 12	27.9725 / 29	0.0467518	0.0504322
6 - 12	27.9725 / 29	0.0467518	0.0504322

ERT4x4(AC)-BBCLL1, Even, Inclusive x_F, Inclusive pseudorapidity, Eta Signal, sqrt, Blue

p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	31.5464 / 37	0.000821681	0.00170509
3 - 4	50.3732 / 37	-0.00196187	0.00380076
4 - 5	29.6476 / 37	-0.000233028	0.00829778
5 - 6	36.7791 / 37	0.0148233	0.0163481
6 - 7	39.5138 / 33	-0.00673167	0.0296052
7 - 8	43.3171 / 30	0.0460253	0.0491077
8 - 12	21.3573 / 27	0.0157469	0.0603035

ERT4x4(AC)-BBCLL1, Even, Inclusive x_F, Inclusive pseudorapidity, Eta Signal, sqrt, Yellow

p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	32.487 / 37	-0.00142737	0.00199622
3 - 4	39.1903 / 37	0.00391631	0.00443954
4 - 5	28.6754 / 37	-0.00705462	0.00968799
5 - 6	36.2456 / 37	0.00552292	0.0190774
6 - 7	45.4438 / 33	-0.0474438	0.0346255
7 - 8	39.9979 / 30	-0.0706001	0.0577007
8 - 12	17.2647 / 27	0.0549443	0.0714717

ERT4x4(AC)-BBCLL1, Even, Inclusive x_F, Inclusive pseudorapidity, Eta Signal, lumi, Blue

p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N

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2 - 3	33.8395 / 37	0.00102043	0.00169069
3 - 4	51.2244 / 37	-0.00216002	0.00378651
4 - 5	28.1068 / 37	0.000511058	0.00827211
5 - 6	29.2303 / 33	0.0092341	0.016362
6 - 7	38.169 / 31	0.00166452	0.0295497
7 - 8	29.182 / 26	0.0533396	0.052103
8 - 12	13.8393 / 15	0.00290966	0.0857435

ERT4x4(AC)-BBCLL1, Even, Inclusive x_F, Inclusive pseudorapidity, Eta Signal, lumi, Yellow

p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	33.917 / 37	-0.0012672	0.00197971
3 - 4	40.5015 / 37	0.00390027	0.00442339
4 - 5	29.4017 / 37	-0.00692521	0.00966036
5 - 6	30.9953 / 33	0.00274176	0.0190958
6 - 7	43.4523 / 31	-0.0454229	0.0344483
7 - 8	28.2337 / 26	-0.0704086	0.0619831
8 - 12	13.7749 / 15	-0.00652109	0.101379

ERT4x4(AC)-BBCLL1, Even, Inclusive x_F, Inclusive pseudorapidity, Eta Background, sqrt, Blue

p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	28.1015 / 37	-0.000356232	0.00166196
3 - 4	42.4992 / 37	0.000435735	0.00429138
4 - 5	31.8714 / 37	-7.0669e-05	0.0102622
5 - 12	27.4872 / 35	-0.0224827	0.0177678
5 - 12	27.4872 / 35	-0.0224827	0.0177678
5 - 12	27.4872 / 35	-0.0224827	0.0177678
5 - 12	27.4872 / 35	-0.0224827	0.0177678

ERT4x4(AC)-BBCLL1, Even, Inclusive x_F, Inclusive pseudorapidity, Eta Background, sqrt, Yellow

p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	53.1807 / 37	0.000726864	0.00194548
3 - 4	40.5853 / 37	-0.00353295	0.0050131
4 - 5	30.7103 / 37	-0.0132029	0.0119699
5 - 12	28.739 / 35	-0.0388794	0.0207427
5 - 12	28.739 / 35	-0.0388794	0.0207427
5 - 12	28.739 / 35	-0.0388794	0.0207427
5 - 12	28.739 / 35	-0.0388794	0.0207427

ERT4x4(AC)-BBCLL1, Even, Inclusive x_F, Inclusive pseudorapidity, Eta Background, lumi, Blue

p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	30.3907 / 37	-0.000602308	0.00165057
3 - 4	41.5076 / 37	0.00103915	0.00427555

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4 - 5	30.9917 / 37	3.73233e-07	0.0102337
5 - 12	26.8216 / 33	-0.0215216	0.017751
5 - 12	26.8216 / 33	-0.0215216	0.017751
5 - 12	26.8216 / 33	-0.0215216	0.017751
5 - 12	26.8216 / 33	-0.0215216	0.017751

ERT4x4(AC)-BBCLL1, Even, Inclusive x_F, Inclusive pseudorapidity, Eta Background, lumi, Yellow

p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	54.9688 / 37	0.000366444	0.00193236
3 - 4	40.6238 / 37	-0.00350564	0.0049948
4 - 5	31.6179 / 37	-0.0120546	0.0119353
5 - 12	26.578 / 33	-0.0417566	0.0207367
5 - 12	26.578 / 33	-0.0417566	0.0207367
5 - 12	26.578 / 33	-0.0417566	0.0207367
5 - 12	26.578 / 33	-0.0417566	0.0207367

ERT4x4(AC)-BBCLL1, Odd, Inclusive x_F, Inclusive pseudorapidity, pi0 Signal, sqrt, Blue

p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
1 - 2	37.166 / 37	-0.000438548	0.000696781
2 - 3	43.3685 / 37	7.37674e-05	0.000834498
3 - 4	32.3529 / 37	0.000417944	0.00174278
4 - 5	29.381 / 37	-0.00296808	0.00379576
5 - 6	33.3545 / 37	0.0131077	0.0076246
6 - 7	35.0534 / 37	-0.0142326	0.0137865
7 - 8	36.2618 / 37	-0.00456707	0.0230803
8 - 9	23.965 / 35	0.00250175	0.0355542
9 - 10	29.1055 / 29	-0.0648411	0.0552403
10 - 12	27.372 / 26	0.128932	0.0663377

ERT4x4(AC)-BBCLL1, Odd, Inclusive x_F, Inclusive pseudorapidity, pi0 Signal, sqrt, Yellow

p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
1 - 2	44.9039 / 37	0.000550461	0.000812355
2 - 3	18.2072 / 37	0.00071247	0.000971944
3 - 4	38.0878 / 37	5.57866e-05	0.00202683
4 - 5	40.813 / 37	0.000176085	0.00441088
5 - 6	27.0249 / 37	-0.00858658	0.00885916
6 - 7	44.7331 / 37	0.00707077	0.0160138
7 - 8	22.4851 / 37	-0.0147713	0.0267758
8 - 9	38.5034 / 35	0.060681	0.0412498
9 - 10	47.4678 / 29	-0.030806	0.064664
10 - 12	43.978 / 26	-0.0444885	0.0773721

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ERT4x4(AC)-BBCLL1, Odd, Inclusive x_F, Inclusive pseudorapidity, pi0 Signal, lumi, Blue			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
1 - 2	37.5382 / 37	-0.000478601	0.000695595
2 - 3	43.3189 / 37	0.000120672	0.000832639
3 - 4	32.0099 / 37	0.000547695	0.00173894
4 - 5	29.6131 / 37	-0.00323413	0.00378795
5 - 6	32.9671 / 37	0.0132375	0.00760542
6 - 7	36.0553 / 37	-0.0149655	0.0137291
7 - 8	34.3397 / 36	-0.0042493	0.0230094
8 - 9	25.7432 / 32	0.00457772	0.0362859
9 - 10	20.6138 / 21	-0.0779762	0.0660751

ERT4x4(AC)-BBCLL1, Odd, Inclusive x_F, Inclusive pseudorapidity, pi0 Signal, lumi, Yellow			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
1 - 2	44.5572 / 37	0.000575972	0.000810947
2 - 3	16.8855 / 37	0.000715847	0.000969781
3 - 4	37.6785 / 37	0.000128686	0.00202241
4 - 5	41.1925 / 37	0.000186635	0.0044019
5 - 6	27.5141 / 37	-0.00874839	0.00883818
6 - 7	43.3208 / 37	0.0083378	0.0159452
7 - 8	23.2471 / 36	-0.0147426	0.0266905
8 - 9	42.9944 / 32	0.0506986	0.0422126
9 - 10	35.3635 / 21	-0.0783002	0.078386

ERT4x4(AC)-BBCLL1, Odd, Inclusive x_F, Inclusive pseudorapidity, pi0 Background, sqrt, Blue			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
1 - 2	37.3837 / 37	-0.00194119	0.000942443
2 - 3	48.8125 / 37	-0.000564638	0.00171279
3 - 4	51.6972 / 37	0.0031409	0.00521337
4 - 5	26.238 / 37	0.0018656	0.0130889
5 - 6	37.7147 / 37	0.0170163	0.0274937
6 - 12	32.1905 / 35	0.0044834	0.0418424
6 - 12	32.1905 / 35	0.0044834	0.0418424
6 - 12	32.1905 / 35	0.0044834	0.0418424
6 - 12	32.1905 / 35	0.0044834	0.0418424
6 - 12	32.1905 / 35	0.0044834	0.0418424

ERT4x4(AC)-BBCLL1, Odd, Inclusive x_F, Inclusive pseudorapidity, pi0 Background, sqrt, Yellow			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
1 - 2	28.3984 / 37	-0.000444591	0.00109867

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2 - 3	58.416 / 37	0.000951092	0.00199464
3 - 4	27.2138 / 37	-0.000210053	0.00606276
4 - 5	40.4706 / 37	-0.0281226	0.0151992
5 - 6	41.4781 / 37	0.0113456	0.031911
6 - 12	39.1424 / 35	0.0177367	0.0484294
6 - 12	39.1424 / 35	0.0177367	0.0484294
6 - 12	39.1424 / 35	0.0177367	0.0484294
6 - 12	39.1424 / 35	0.0177367	0.0484294
6 - 12	39.1424 / 35	0.0177367	0.0484294

ERT4x4(AC)-BBCLL1, Odd, Inclusive x_F, Inclusive pseudorapidity, pi0 Background, lumi, Blue

p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
1 - 2	37.6951 / 37	-0.00205029	0.000940636
2 - 3	49.5679 / 37	-0.000552659	0.00171085
3 - 4	51.5488 / 37	0.00291849	0.00521003
4 - 5	26.0344 / 37	0.00155133	0.0130679
5 - 6	36.2195 / 35	0.0168539	0.0274785
6 - 12	31.435 / 29	0.0085359	0.0429185
6 - 12	31.435 / 29	0.0085359	0.0429185
6 - 12	31.435 / 29	0.0085359	0.0429185
6 - 12	31.435 / 29	0.0085359	0.0429185
6 - 12	31.435 / 29	0.0085359	0.0429185

ERT4x4(AC)-BBCLL1, Odd, Inclusive x_F, Inclusive pseudorapidity, pi0 Background, lumi, Yellow

p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
1 - 2	28.7098 / 37	-0.000492311	0.00109653
2 - 3	56.7905 / 37	0.000927256	0.00199238
3 - 4	27.3735 / 37	-0.00014178	0.00605823
4 - 5	41.0449 / 37	-0.0290631	0.0151705
5 - 6	36.6205 / 35	0.0189031	0.0319168
6 - 12	34.3357 / 29	0.00221104	0.0501177
6 - 12	34.3357 / 29	0.00221104	0.0501177
6 - 12	34.3357 / 29	0.00221104	0.0501177
6 - 12	34.3357 / 29	0.00221104	0.0501177
6 - 12	34.3357 / 29	0.00221104	0.0501177

ERT4x4(AC)-BBCLL1, Odd, Inclusive x_F, Inclusive pseudorapidity, Eta Signal, sqrt, Blue

p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	26.3778 / 37	-0.00246087	0.0016407
3 - 4	35.3797 / 37	-0.00547732	0.00367542
4 - 5	31.0293 / 37	-0.00441588	0.00802175
5 - 6	31.9552 / 37	0.00896483	0.0158214

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6 - 7	35.4292 / 37	-0.0441715	0.0284731
7 - 8	20.0965 / 31	-0.0489068	0.0488245
8 - 12	22.4407 / 27	-0.0208115	0.0604278

ERT4x4(AC)-BBCLL1, Odd, Inclusive x_F, Inclusive pseudorapidity, Eta Signal, sqrt, Yellow

p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	35.7467 / 37	-0.0013864	0.00191082
3 - 4	33.4461 / 37	0.00249278	0.00427619
4 - 5	46.7652 / 37	-0.00849389	0.00931606
5 - 6	38.8641 / 37	-0.00256081	0.0183815
6 - 7	47.0355 / 37	-0.0520616	0.0331313
7 - 8	34.8254 / 31	0.0608462	0.0569616
8 - 12	35.5945 / 27	0.130441	0.0705941

ERT4x4(AC)-BBCLL1, Odd, Inclusive x_F, Inclusive pseudorapidity, Eta Signal, lumi, Blue

p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	26.7834 / 37	-0.00250558	0.00162668
3 - 4	33.7071 / 37	-0.00598469	0.0036614
4 - 5	31.2634 / 37	-0.00462601	0.00799147
5 - 6	30.7954 / 37	0.010635	0.0157448
6 - 7	33.4399 / 35	-0.0383781	0.028578
7 - 8	18.4854 / 24	-0.0415462	0.0535147
8 - 12	18.1208 / 15	-0.0662577	0.0805616

ERT4x4(AC)-BBCLL1, Odd, Inclusive x_F, Inclusive pseudorapidity, Eta Signal, lumi, Yellow

p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	38.6679 / 37	-0.00158635	0.0018946
3 - 4	34.3511 / 37	0.00166815	0.00425951
4 - 5	46.8928 / 37	-0.00968874	0.00928156
5 - 6	38.5769 / 37	-0.00106214	0.0182868
6 - 7	43.63 / 35	-0.0551049	0.0331025
7 - 8	33.1201 / 24	0.0503284	0.0624796
8 - 12	14.4612 / 15	-0.0290765	0.0947451

ERT4x4(AC)-BBCLL1, Odd, Inclusive x_F, Inclusive pseudorapidity, Eta Background, sqrt, Blue

p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	48.7392 / 37	-0.000453835	0.00159968
3 - 4	50.9981 / 37	-0.000154178	0.00415644
4 - 5	42.8015 / 37	-0.00576966	0.00988401
5 - 12	48.1245 / 37	-0.0189546	0.0173698
5 - 12	48.1245 / 37	-0.0189546	0.0173698

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5 - 12	48.1245 / 37	-0.0189546	0.0173698
5 - 12	48.1245 / 37	-0.0189546	0.0173698

ERT4x4(AC)-BBCLL1, Odd, Inclusive x_F, Inclusive pseudorapidity, Eta Background, sqrt, Yellow			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	19.7167 / 37	0.00326896	0.00186303
3 - 4	33.1808 / 37	0.00605796	0.00483437
4 - 5	41.0819 / 37	-0.00297283	0.0114849
5 - 12	33.7345 / 37	-0.00433947	0.0201916
5 - 12	33.7345 / 37	-0.00433947	0.0201916
5 - 12	33.7345 / 37	-0.00433947	0.0201916
5 - 12	33.7345 / 37	-0.00433947	0.0201916

ERT4x4(AC)-BBCLL1, Odd, Inclusive x_F, Inclusive pseudorapidity, Eta Background, lumi, Blue			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	48.3597 / 37	-0.000562091	0.00158889
3 - 4	52.2209 / 37	-9.82115e-05	0.00413913
4 - 5	43.7403 / 37	-0.00725835	0.00985356
5 - 12	48.5082 / 37	-0.0203472	0.0172925
5 - 12	48.5082 / 37	-0.0203472	0.0172925
5 - 12	48.5082 / 37	-0.0203472	0.0172925
5 - 12	48.5082 / 37	-0.0203472	0.0172925

ERT4x4(AC)-BBCLL1, Odd, Inclusive x_F, Inclusive pseudorapidity, Eta Background, lumi, Yellow			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	21.1336 / 37	0.00298964	0.00185053
3 - 4	33.6915 / 37	0.00642533	0.00481435
4 - 5	41.7619 / 37	-0.00304019	0.0114454
5 - 12	34.7067 / 37	-0.00276609	0.020105
5 - 12	34.7067 / 37	-0.00276609	0.020105
5 - 12	34.7067 / 37	-0.00276609	0.020105
5 - 12	34.7067 / 37	-0.00276609	0.020105

B.2 Backward x_F

ERT4x4(AC)-BBCLL1, Even, $x_F < -0.01$, Inclusive pseudorapidity, pi0 Signal, sqrt, Blue			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	35.3352 / 36	0.00498196	0.0156241
3 - 4	43.8809 / 37	-0.0024728	0.00785732
4 - 5	33.2618 / 37	-0.0029355	0.0112776
5 - 6	29.3576 / 34	0.0256571	0.019176
6 - 7	17.2009 / 33	-0.0259629	0.0317786
7 - 8	33.1374 / 29	0.0476689	0.050224
8 - 9	19.5713 / 21	-0.158	0.0815483

ERT4x4(AC)-BBCLL1, Even, $x_F < -0.01$, Inclusive pseudorapidity, pi0 Signal, sqrt, Yellow			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	37.5113 / 37	0.00604167	0.0159042
3 - 4	38.0063 / 37	0.00045097	0.00817416
4 - 5	47.5136 / 37	-0.00820828	0.0113427
5 - 6	32.8916 / 36	-0.0464139	0.0187011
6 - 7	41.5397 / 33	-0.0434492	0.0308422
7 - 8	34.6308 / 31	0.0252103	0.0489955
8 - 9	32.667 / 25	0.0876482	0.0757679

ERT4x4(AC)-BBCLL1, Even, $x_F < -0.01$, Inclusive pseudorapidity, pi0 Signal, lumi, Blue			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	37.7958 / 35	0.000552328	0.0154763
3 - 4	42.4033 / 37	-0.00225143	0.00784039
4 - 5	33.4754 / 36	-0.00210451	0.0112675
5 - 6	28.8596 / 33	0.0266931	0.019123
6 - 7	18.1061 / 31	-0.023456	0.031776
7 - 8	41.9658 / 25	0.0211656	0.0532106

ERT4x4(AC)-BBCLL1, Even, $x_F < -0.01$, Inclusive pseudorapidity, pi0 Signal, lumi, Yellow			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	33.0099 / 37	0.00673258	0.0150848
3 - 4	39.4761 / 37	0.00241694	0.00787867
4 - 5	44.9351 / 37	-0.00772332	0.0111383
5 - 6	29.7126 / 34	-0.0472102	0.0185598
6 - 7	41.2891 / 32	-0.038708	0.0305963
7 - 8	37.1218 / 28	0.0183278	0.0490833

ERT4x4(AC)-BBCLL1, Even, $x_F < -0.01$, Inclusive pseudorapidity, pi0 Background, sqrt, Blue			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	41.7127 / 32	0.0434833	0.0369341
3 - 4	28.5081 / 34	-0.0046131	0.0232002

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4 - 5	31.9647 / 32	-0.028082	0.0386829
5 - 6	19.1455 / 23	-0.022682	0.0754389

ERT4x4(AC)-BBCLL1, Even, $x_F < -0.01$, Inclusive pseudorapidity, pi0 Background, sqrt, Yellow			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	43.3039 / 33	-0.0309295	0.0354264
3 - 4	33.3276 / 35	0.0260893	0.0233237
4 - 5	32.1904 / 33	0.00116542	0.0371023
5 - 6	41.6164 / 29	0.0291894	0.0663596
6 - 12	27.5685 / 26	0.0644427	0.0853708
6 - 12	27.5685 / 26	0.0644427	0.0853708
6 - 12	27.5685 / 26	0.0644427	0.0853708
6 - 12	27.5685 / 26	0.0644427	0.0853708
6 - 12	27.5685 / 26	0.0644427	0.0853708

ERT4x4(AC)-BBCLL1, Even, $x_F < -0.01$, Inclusive pseudorapidity, pi0 Background, lumi, Blue			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	39.9972 / 31	0.0435837	0.036719
3 - 4	28.5563 / 33	-0.00783221	0.0230996
4 - 5	30.7582 / 30	-0.0370988	0.0391137

ERT4x4(AC)-BBCLL1, Even, $x_F < -0.01$, Inclusive pseudorapidity, pi0 Background, lumi, Yellow			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	43.7718 / 33	-0.03283	0.034343
3 - 4	35.0093 / 33	0.0212872	0.0229837
4 - 5	32.4711 / 32	0.00192459	0.0365351
5 - 6	42.832 / 23	0.0443813	0.0772421
6 - 12	13.3897 / 20	-0.10317	0.106809
6 - 12	13.3897 / 20	-0.10317	0.106809
6 - 12	13.3897 / 20	-0.10317	0.106809
6 - 12	13.3897 / 20	-0.10317	0.106809
6 - 12	13.3897 / 20	-0.10317	0.106809

ERT4x4(AC)-BBCLL1, Even, $x_F < -0.01$, Inclusive pseudorapidity, Eta Signal, sqrt, Blue			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	28.0635 / 31	-0.0635706	0.0470511
3 - 4	26.9905 / 34	0.00802083	0.0223907
4 - 5	32.5041 / 33	-0.0229595	0.0280483
5 - 6	28.1083 / 31	-0.043718	0.0438157
6 - 7	41.1102 / 20	0.178599	0.0778159

ERT4x4(AC)-BBCLL1, Even, $x_F < -0.01$, Inclusive pseudorapidity, Eta Signal, sqrt, Yellow			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	26.2871 / 32	0.0226085	0.0464626
3 - 4	30.1877 / 34	0.00405136	0.0227077
4 - 5	38.1153 / 34	-0.0320605	0.0281132
5 - 6	55.6103 / 32	-0.00778707	0.0433886
6 - 7	34.4323 / 27	-0.0867149	0.0699347

ERT4x4(AC)-BBCLL1, Even, $x_F < -0.01$, Inclusive pseudorapidity, Eta Signal, lumi, Blue			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	18.7845 / 23	-0.0859484	0.0509442
3 - 4	26.6838 / 33	0.00940646	0.0223304
4 - 5	31.0194 / 32	-0.0289811	0.0279975
5 - 6	29.1292 / 26	-0.0595499	0.0447794

ERT4x4(AC)-BBCLL1, Even, $x_F < -0.01$, Inclusive pseudorapidity, Eta Signal, lumi, Yellow			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	19.5554 / 31	0.0190582	0.0448515
3 - 4	30.3829 / 33	0.00113754	0.0219409
4 - 5	41.1583 / 33	-0.0324996	0.0275493
5 - 6	65.8972 / 30	-0.00976168	0.0436027
6 - 7	21.3607 / 17	-0.0989696	0.0970874

ERT4x4(AC)-BBCLL1, Even, $x_F < -0.01$, Inclusive pseudorapidity, Eta Background, sqrt, Blue			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	28.4944 / 31	-0.0457607	0.0463988
3 - 4	39.75 / 33	0.00409688	0.0237485
4 - 5	36.4514 / 33	0.00707017	0.0335315
5 - 12	29.9107 / 31	-0.0113263	0.0439105
5 - 12	29.9107 / 31	-0.0113263	0.0439105
5 - 12	29.9107 / 31	-0.0113263	0.0439105
5 - 12	29.9107 / 31	-0.0113263	0.0439105

ERT4x4(AC)-BBCLL1, Even, $x_F < -0.01$, Inclusive pseudorapidity, Eta Background, sqrt, Yellow			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	30.2165 / 32	-0.0810469	0.0443587
3 - 4	63.84 / 35	0.0307978	0.0238992
4 - 5	34.03 / 33	0.0125555	0.0332555
5 - 12	20.1964 / 33	-0.040334	0.0425733
5 - 12	20.1964 / 33	-0.040334	0.0425733
5 - 12	20.1964 / 33	-0.040334	0.0425733
5 - 12	20.1964 / 33	-0.040334	0.0425733

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ERT4x4(AC)-BBCLL1, Even, $x_F < -0.01$, Inclusive pseudorapidity, Eta Background, lumi, Blue			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	25.9758 / 25	-0.0269157	0.0487904
3 - 4	40.197 / 33	0.00324002	0.0235965
4 - 5	34.4374 / 31	0.00958675	0.0334832
5 - 12	38.2051 / 28	-0.0100812	0.0444386
5 - 12	38.2051 / 28	-0.0100812	0.0444386
5 - 12	38.2051 / 28	-0.0100812	0.0444386
5 - 12	38.2051 / 28	-0.0100812	0.0444386

ERT4x4(AC)-BBCLL1, Even, $x_F < -0.01$, Inclusive pseudorapidity, Eta Background, lumi, Yellow			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	32.2687 / 31	-0.0477131	0.0420292
3 - 4	68.0802 / 33	0.0353414	0.0232635
4 - 5	35.5365 / 32	0.0112544	0.0326532
5 - 12	15.0361 / 31	-0.0394678	0.0425481
5 - 12	15.0361 / 31	-0.0394678	0.0425481
5 - 12	15.0361 / 31	-0.0394678	0.0425481
5 - 12	15.0361 / 31	-0.0394678	0.0425481

ERT4x4(AC)-BBCLL1, Odd, $x_F < -0.01$, Inclusive pseudorapidity, pi0 Signal, sqrt, Blue			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	40.6784 / 37	0.0115176	0.015073
3 - 4	40.4297 / 37	0.00110982	0.00759187
4 - 5	37.7317 / 37	-0.00618858	0.0109219
5 - 6	22.2696 / 37	0.00345248	0.0185758
6 - 7	41.7474 / 36	-0.0105797	0.0306299
7 - 8	38.4709 / 32	0.114096	0.048033
8 - 9	25.6635 / 19	-0.0796139	0.0857336

ERT4x4(AC)-BBCLL1, Odd, $x_F < -0.01$, Inclusive pseudorapidity, pi0 Signal, sqrt, Yellow			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	38.9058 / 37	0.013986	0.0152778
3 - 4	30.6804 / 37	-0.00317259	0.00789507
4 - 5	39.1505 / 37	-0.00254949	0.0109505
5 - 6	42.549 / 37	-0.0137444	0.0181785
6 - 7	59.0066 / 37	0.00274965	0.0296525
7 - 8	35.6993 / 34	-0.0236013	0.0479363
8 - 9	36.7287 / 27	-0.0147692	0.0738658

ERT4x4(AC)-BBCLL1, Odd, $x_F < -0.01$, Inclusive pseudorapidity, pi0 Signal, lumi, Blue			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	42.3682 / 37	0.0142843	0.014869
3 - 4	40.1738 / 37	0.0007411	0.00757712
4 - 5	37.7899 / 37	-0.00657943	0.0109064
5 - 6	23.1117 / 37	0.00381276	0.0185042
6 - 7	43.2323 / 34	-0.0142346	0.0307026
7 - 8	30.3198 / 25	0.091876	0.0522082

ERT4x4(AC)-BBCLL1, Odd, $x_F < -0.01$, Inclusive pseudorapidity, pi0 Signal, lumi, Yellow			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	30.1872 / 37	0.00542656	0.0144305
3 - 4	35.5101 / 37	-0.00260494	0.0076096
4 - 5	40.3197 / 37	-0.00391727	0.0107468
5 - 6	43.6777 / 37	-0.0130456	0.0179254
6 - 7	59.8155 / 36	-0.00191336	0.0292449
7 - 8	24.0221 / 28	0.00898545	0.0495492
8 - 9	8.07503 / 11	0.0529965	0.121569

ERT4x4(AC)-BBCLL1, Odd, $x_F < -0.01$, Inclusive pseudorapidity, pi0 Background, sqrt, Blue			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	27.7237 / 37	0.054602	0.0350808
3 - 4	43.0958 / 37	0.00964603	0.0225109
4 - 5	29.8725 / 35	-0.00410012	0.0371637
5 - 6	24.4605 / 24	0.0261	0.0724318

ERT4x4(AC)-BBCLL1, Odd, $x_F < -0.01$, Inclusive pseudorapidity, pi0 Background, sqrt, Yellow			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	40.5901 / 37	-0.0121628	0.0340276
3 - 4	32.0432 / 37	0.00533183	0.0224763
4 - 5	52.4864 / 37	-0.00581268	0.0354903
5 - 6	26.1939 / 29	0.102071	0.0652372
6 - 12	25.0281 / 28	0.0390222	0.0847525
6 - 12	25.0281 / 28	0.0390222	0.0847525
6 - 12	25.0281 / 28	0.0390222	0.0847525
6 - 12	25.0281 / 28	0.0390222	0.0847525
6 - 12	25.0281 / 28	0.0390222	0.0847525

ERT4x4(AC)-BBCLL1, Odd, $x_F < -0.01$, Inclusive pseudorapidity, pi0 Background, lumi, Blue			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	26.7781 / 32	0.0589499	0.0358798
3 - 4	43.7082 / 37	0.00926975	0.0223584
4 - 5	22.0563 / 30	0.00608515	0.0383453

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ERT4x4(AC)-BBCLL1, Odd, $x_F < -0.01$, Inclusive pseudorapidity, pi0 Background, lumi, Yellow			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	40.0514 / 35	-0.00118177	0.0332582
3 - 4	35.41 / 37	0.00197091	0.0219621
4 - 5	48.3362 / 36	-0.00625205	0.0353297
5 - 6	15.5412 / 24	0.0400739	0.0701321
6 - 12	16.5398 / 14	0.0402271	0.124152
6 - 12	16.5398 / 14	0.0402271	0.124152
6 - 12	16.5398 / 14	0.0402271	0.124152
6 - 12	16.5398 / 14	0.0402271	0.124152
6 - 12	16.5398 / 14	0.0402271	0.124152

ERT4x4(AC)-BBCLL1, Odd, $x_F < -0.01$, Inclusive pseudorapidity, Eta Signal, sqrt, Blue			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	29.9439 / 32	0.00570611	0.0473479
3 - 4	40.0833 / 37	-0.00329622	0.0214348
4 - 5	40.3258 / 36	0.0126152	0.0275023
5 - 6	32.5663 / 35	0.0215659	0.042464
6 - 7	25.0938 / 24	0.0104672	0.0740937

ERT4x4(AC)-BBCLL1, Odd, $x_F < -0.01$, Inclusive pseudorapidity, Eta Signal, sqrt, Yellow			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	34.4141 / 35	0.0353989	0.0439201
3 - 4	40.8 / 37	0.0124357	0.021936
4 - 5	26.6129 / 37	-0.00493414	0.02738
5 - 6	35.8248 / 36	0.0501809	0.0413115
6 - 7	21.0348 / 28	0.0818068	0.0697231

ERT4x4(AC)-BBCLL1, Odd, $x_F < -0.01$, Inclusive pseudorapidity, Eta Signal, lumi, Blue			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	29.7112 / 25	0.0561887	0.0503557
3 - 4	41.106 / 37	-0.00262901	0.021368
4 - 5	41.1778 / 35	0.0154143	0.0273998
5 - 6	32.6802 / 27	0.0279906	0.0449912

ERT4x4(AC)-BBCLL1, Odd, $x_F < -0.01$, Inclusive pseudorapidity, Eta Signal, lumi, Yellow			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	37.2255 / 33	0.0118344	0.0431412
3 - 4	46.7134 / 37	0.0110472	0.0211405
4 - 5	26.1528 / 37	0.000214338	0.0267529

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5 - 6	37.1028 / 32	0.0695439	0.0425839
6 - 7	20.8907 / 19	0.113189	0.0913693

ERT4x4(AC)-BBCLL1, Odd, $x_F < -0.01$, Inclusive pseudorapidity, Eta Background, sqrt, Blue

p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	25.1098 / 33	0.000708002	0.0456416
3 - 4	30.2592 / 37	-0.011998	0.0226417
4 - 5	30.5782 / 36	0.0920099	0.031842
5 - 12	40.7613 / 34	-0.0366726	0.0433419
5 - 12	40.7613 / 34	-0.0366726	0.0433419
5 - 12	40.7613 / 34	-0.0366726	0.0433419
5 - 12	40.7613 / 34	-0.0366726	0.0433419

ERT4x4(AC)-BBCLL1, Odd, $x_F < -0.01$, Inclusive pseudorapidity, Eta Background, sqrt, Yellow

p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	41.736 / 36	0.0991322	0.0429758
3 - 4	40.8884 / 37	-0.0292805	0.0231171
4 - 5	55.0441 / 37	0.00469301	0.0319897
5 - 12	34.7542 / 36	0.078382	0.041703
5 - 12	34.7542 / 36	0.078382	0.041703
5 - 12	34.7542 / 36	0.078382	0.041703
5 - 12	34.7542 / 36	0.078382	0.041703

ERT4x4(AC)-BBCLL1, Odd, $x_F < -0.01$, Inclusive pseudorapidity, Eta Background, lumi, Blue

p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	19.037 / 25	0.026458	0.0493683
3 - 4	30.4351 / 37	-0.0152469	0.0225477
4 - 5	28.86 / 35	0.0813595	0.0318458
5 - 12	23.5627 / 25	-0.0162761	0.0464938
5 - 12	23.5627 / 25	-0.0162761	0.0464938
5 - 12	23.5627 / 25	-0.0162761	0.0464938
5 - 12	23.5627 / 25	-0.0162761	0.0464938

ERT4x4(AC)-BBCLL1, Odd, $x_F < -0.01$, Inclusive pseudorapidity, Eta Background, lumi, Yellow

p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	40.3701 / 34	0.0711767	0.0413079
3 - 4	47.5248 / 37	-0.0158183	0.0223111
4 - 5	41.8934 / 35	-0.00575412	0.0317568
5 - 12	32.8155 / 33	0.0886145	0.0421675
5 - 12	32.8155 / 33	0.0886145	0.0421675
5 - 12	32.8155 / 33	0.0886145	0.0421675

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5 - 12	32.8155 / 33	0.0886145	0.0421675

B.3 Forward x_F

ERT4x4(AC)-BBCLL1, Even, $x_F > 0.01$, Inclusive pseudorapidity, pi0 Signal, sqrt, Blue			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	59.4728 / 37	0.00516998	0.0135732
3 - 4	28.5132 / 37	-0.00872461	0.00699325
4 - 5	33.6619 / 37	0.0108625	0.00972166
5 - 6	68.0126 / 36	-0.0196882	0.0160157
6 - 7	24.7327 / 33	0.00977629	0.026443
7 - 8	20.5591 / 31	-0.0580357	0.0418218
8 - 9	55.2439 / 25	-0.0646359	0.0641225

ERT4x4(AC)-BBCLL1, Even, $x_F > 0.01$, Inclusive pseudorapidity, pi0 Signal, sqrt, Yellow			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	29.9771 / 36	0.0416547	0.0182733
3 - 4	23.0357 / 37	0.01737	0.00917849
4 - 5	35.7109 / 37	0.0152196	0.0131648
5 - 6	44.6608 / 34	0.0395308	0.0223513
6 - 7	26.0251 / 33	0.00161067	0.0370117
7 - 8	25.4827 / 29	-0.0602345	0.0590099
8 - 9	16.8983 / 21	-0.108981	0.0970488

ERT4x4(AC)-BBCLL1, Even, $x_F > 0.01$, Inclusive pseudorapidity, pi0 Signal, lumi, Blue			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	49.4184 / 37	0.00430211	0.0128809
3 - 4	27.6061 / 37	-0.00731653	0.00674109
4 - 5	28.9481 / 37	0.00669449	0.00954718
5 - 6	70.7603 / 34	-0.0182615	0.0158902
6 - 7	23.2862 / 32	0.00872598	0.0262217
7 - 8	20.4509 / 28	-0.0746939	0.042076

ERT4x4(AC)-BBCLL1, Even, $x_F > 0.01$, Inclusive pseudorapidity, pi0 Signal, lumi, Yellow			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	29.5099 / 35	0.0387547	0.0180888
3 - 4	22.0425 / 37	0.0171433	0.00915931
4 - 5	34.8388 / 36	0.0150156	0.0131502
5 - 6	45.5384 / 33	0.0427623	0.02232
6 - 7	26.5904 / 31	0.00217896	0.0371705
7 - 8	27.2594 / 25	-0.0755692	0.0627293

ERT4x4(AC)-BBCLL1, Even, $x_F > 0.01$, Inclusive pseudorapidity, pi0 Background, sqrt, Blue			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	26.0788 / 33	-0.00044188	0.0303052
3 - 4	39.6313 / 35	-0.00196203	0.0199614

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4 - 5	24.2695 / 33	-0.0312148	0.0317673
5 - 6	15.7783 / 29	-0.0249307	0.0569044
6 - 12	36.2917 / 26	-0.0867671	0.0723827
6 - 12	36.2917 / 26	-0.0867671	0.0723827
6 - 12	36.2917 / 26	-0.0867671	0.0723827
6 - 12	36.2917 / 26	-0.0867671	0.0723827
6 - 12	36.2917 / 26	-0.0867671	0.0723827

ERT4x4(AC)-BBCLL1, Even, $x_F > 0.01$, Inclusive pseudorapidity, pi0 Background, sqrt, Yellow

p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	28.997 / 32	0.0440466	0.0433059
3 - 4	26.2732 / 34	-0.014027	0.0271685
4 - 5	20.8397 / 32	0.0647178	0.0453001
5 - 6	19.0366 / 23	-0.0214381	0.0869886

ERT4x4(AC)-BBCLL1, Even, $x_F > 0.01$, Inclusive pseudorapidity, pi0 Background, lumi, Blue

p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	29.5317 / 33	0.00213399	0.0294232
3 - 4	39.663 / 33	-0.00540949	0.0196583
4 - 5	25.9718 / 32	-0.027369	0.031264
5 - 6	22.9798 / 23	-0.0439641	0.0654857
6 - 12	31.2763 / 20	0.0275881	0.0905869
6 - 12	31.2763 / 20	0.0275881	0.0905869
6 - 12	31.2763 / 20	0.0275881	0.0905869
6 - 12	31.2763 / 20	0.0275881	0.0905869
6 - 12	31.2763 / 20	0.0275881	0.0905869

ERT4x4(AC)-BBCLL1, Even, $x_F > 0.01$, Inclusive pseudorapidity, pi0 Background, lumi, Yellow

p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	23.1305 / 31	0.0462834	0.0430347
3 - 4	27.5079 / 33	-0.0184711	0.0270289
4 - 5	26.6298 / 30	0.0738114	0.0458289

ERT4x4(AC)-BBCLL1, Even, $x_F > 0.01$, Inclusive pseudorapidity, Eta Signal, sqrt, Blue

p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	24.1441 / 32	-0.0137786	0.0397858
3 - 4	33.1949 / 34	-0.029591	0.0194404
4 - 5	42.9238 / 34	0.0201307	0.0240533
5 - 6	48.4235 / 32	-0.0135746	0.0372247
6 - 7	33.7366 / 27	-0.0930298	0.0594745

ERT4x4(AC)-BBCLL1, Even, $x_F > 0.01$, Inclusive pseudorapidity, Eta Signal, sqrt, Yellow			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	23.7372 / 31	-0.0112389	0.0550875
3 - 4	35.4741 / 34	-0.0132614	0.0261334
4 - 5	38.1853 / 33	-0.042162	0.032737
5 - 6	45.2197 / 31	0.0306079	0.0512153
6 - 7	16.8256 / 20	0.152219	0.0956613

ERT4x4(AC)-BBCLL1, Even, $x_F > 0.01$, Inclusive pseudorapidity, Eta Signal, lumi, Blue			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	25.1179 / 31	0.0133934	0.0382088
3 - 4	35.6963 / 33	-0.0293748	0.0187709
4 - 5	38.508 / 33	0.0231807	0.0235872
5 - 6	46.0425 / 30	-0.0215263	0.0372373
6 - 7	23.1851 / 17	0.0637645	0.0830972

ERT4x4(AC)-BBCLL1, Even, $x_F > 0.01$, Inclusive pseudorapidity, Eta Signal, lumi, Yellow			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	20.8463 / 23	-0.0322603	0.0601797
3 - 4	34.6122 / 33	-0.0175316	0.0260725
4 - 5	39.8087 / 32	-0.0428449	0.0325967
5 - 6	47.1914 / 26	-0.00548764	0.0526167

ERT4x4(AC)-BBCLL1, Even, $x_F > 0.01$, Inclusive pseudorapidity, Eta Background, sqrt, Blue			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	23.9136 / 32	-0.0125277	0.037935
3 - 4	27.4938 / 35	-0.0262022	0.0204979
4 - 5	23.9596 / 33	-0.00116704	0.0285443
5 - 12	36.9293 / 33	-0.0388555	0.0362756
5 - 12	36.9293 / 33	-0.0388555	0.0362756
5 - 12	36.9293 / 33	-0.0388555	0.0362756
5 - 12	36.9293 / 33	-0.0388555	0.0362756

ERT4x4(AC)-BBCLL1, Even, $x_F > 0.01$, Inclusive pseudorapidity, Eta Background, sqrt, Yellow			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	33.5787 / 31	0.0475004	0.0541912
3 - 4	29.2042 / 33	-0.00289454	0.0277379
4 - 5	30.6169 / 33	0.0317963	0.0391456
5 - 12	25.0157 / 31	-0.0763925	0.0514541
5 - 12	25.0157 / 31	-0.0763925	0.0514541
5 - 12	25.0157 / 31	-0.0763925	0.0514541
5 - 12	25.0157 / 31	-0.0763925	0.0514541

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ERT4x4(AC)-BBCLL1, Even, $x_F > 0.01$, Inclusive pseudorapidity, Eta Background, lumi, Blue			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	16.5446 / 31	-0.0200402	0.0358519
3 - 4	25.4971 / 33	-0.026637	0.0199595
4 - 5	24.993 / 32	0.00643415	0.0280517
5 - 12	34.3085 / 31	-0.0318081	0.0361842
5 - 12	34.3085 / 31	-0.0318081	0.0361842
5 - 12	34.3085 / 31	-0.0318081	0.0361842
5 - 12	34.3085 / 31	-0.0318081	0.0361842

ERT4x4(AC)-BBCLL1, Even, $x_F > 0.01$, Inclusive pseudorapidity, Eta Background, lumi, Yellow			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	30.4416 / 25	0.036642	0.0572811
3 - 4	29.4834 / 33	-0.00317003	0.0276173
4 - 5	29.2904 / 31	0.0339243	0.0391364
5 - 12	21.4962 / 28	-0.0528617	0.0526606
5 - 12	21.4962 / 28	-0.0528617	0.0526606
5 - 12	21.4962 / 28	-0.0528617	0.0526606
5 - 12	21.4962 / 28	-0.0528617	0.0526606

ERT4x4(AC)-BBCLL1, Odd, $x_F > 0.01$, Inclusive pseudorapidity, pi0 Signal, sqrt, Blue			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	37.6651 / 37	-0.00756377	0.0131317
3 - 4	39.9401 / 37	-0.00404695	0.00678889
4 - 5	40.5382 / 37	-0.00276218	0.00942153
5 - 6	32.3072 / 37	0.00933576	0.0156374
6 - 7	37.3319 / 37	-0.0529542	0.0255428
7 - 8	25.017 / 34	-0.046626	0.0413032
8 - 9	18.8218 / 27	0.0294509	0.0629585

ERT4x4(AC)-BBCLL1, Odd, $x_F > 0.01$, Inclusive pseudorapidity, pi0 Signal, sqrt, Yellow			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	43.8394 / 37	0.00654418	0.0175207
3 - 4	26.1912 / 37	0.0135142	0.00882402
4 - 5	37.3169 / 37	0.00734991	0.0126819
5 - 6	26.3605 / 37	0.00841894	0.021618
6 - 7	31.6664 / 36	-0.0313368	0.0356795
7 - 8	35.2466 / 32	-0.0271064	0.0561295
8 - 9	7.04508 / 19	0.0701499	0.102758

ERT4x4(AC)-BBCLL1, Odd, $x_F > 0.01$, Inclusive pseudorapidity, pi0 Signal, lumi, Blue			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	47.4452 / 37	-0.00599716	0.0123963
3 - 4	33.1618 / 37	-0.00365602	0.00654249
4 - 5	43.4349 / 37	-0.00392756	0.00924644
5 - 6	31.6191 / 37	0.0105576	0.0154365
6 - 7	37.8598 / 36	-0.0525579	0.0252202
7 - 8	19.3158 / 28	-0.0578429	0.0424728
8 - 9	6.21869 / 11	-0.0138699	0.103282

ERT4x4(AC)-BBCLL1, Odd, $x_F > 0.01$, Inclusive pseudorapidity, pi0 Signal, lumi, Yellow			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	43.8156 / 37	0.0095028	0.017296
3 - 4	27.4001 / 37	0.0134995	0.00880607
4 - 5	37.7821 / 37	0.00713157	0.0126637
5 - 6	26.5871 / 37	0.00855012	0.0215375
6 - 7	33.587 / 34	-0.0400562	0.035798
7 - 8	19.0239 / 25	-0.0765252	0.0616401

ERT4x4(AC)-BBCLL1, Odd, $x_F > 0.01$, Inclusive pseudorapidity, pi0 Background, sqrt, Blue			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	34.3823 / 37	-0.0394129	0.0291833
3 - 4	35.357 / 37	-0.00691098	0.019299
4 - 5	33.5781 / 37	0.0188988	0.0306316
5 - 6	21.1699 / 29	-0.00737867	0.0559327
6 - 12	11.1548 / 28	0.0521096	0.0725089
6 - 12	11.1548 / 28	0.0521096	0.0725089
6 - 12	11.1548 / 28	0.0521096	0.0725089
6 - 12	11.1548 / 28	0.0521096	0.0725089
6 - 12	11.1548 / 28	0.0521096	0.0725089

ERT4x4(AC)-BBCLL1, Odd, $x_F > 0.01$, Inclusive pseudorapidity, pi0 Background, sqrt, Yellow			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	50.9783 / 37	0.0228734	0.0408269
3 - 4	46.9876 / 37	-0.00445502	0.0261706
4 - 5	60.5502 / 35	0.0188008	0.043111
5 - 6	17.0493 / 24	0.024826	0.0848496

ERT4x4(AC)-BBCLL1, Odd, $x_F > 0.01$, Inclusive pseudorapidity, pi0 Background, lumi, Blue			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	38.4598 / 35	-0.0377492	0.0286146
3 - 4	34.9318 / 37	-0.00604085	0.0188945
4 - 5	34.1006 / 36	0.0136884	0.0305007

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5 - 6	17.7172 / 24	-0.0305406	0.0595182
6 - 12	5.86233 / 14	0.0837283	0.110397
6 - 12	5.86233 / 14	0.0837283	0.110397
6 - 12	5.86233 / 14	0.0837283	0.110397
6 - 12	5.86233 / 14	0.0837283	0.110397
6 - 12	5.86233 / 14	0.0837283	0.110397

ERT4x4(AC)-BBCLL1, Odd, $x_F > 0.01$, Inclusive pseudorapidity, pi0 Background, lumi, Yellow			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	45.6958 / 32	0.0275453	0.0417627
3 - 4	47.9177 / 37	-0.0071283	0.0259909
4 - 5	56.0996 / 30	0.0168768	0.0447365

ERT4x4(AC)-BBCLL1, Odd, $x_F > 0.01$, Inclusive pseudorapidity, Eta Signal, sqrt, Blue			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	39.8297 / 35	-0.0536534	0.0377673
3 - 4	31.3156 / 37	-0.0183686	0.01881
4 - 5	27.1541 / 37	-0.0176756	0.0235593
5 - 6	34.2728 / 36	0.0268477	0.0356099
6 - 7	29.0207 / 28	0.0579098	0.0587331

ERT4x4(AC)-BBCLL1, Odd, $x_F > 0.01$, Inclusive pseudorapidity, Eta Signal, sqrt, Yellow			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	37.0843 / 32	0.0453971	0.054717
3 - 4	41.159 / 37	-0.0492377	0.0249118
4 - 5	52.9172 / 36	0.025673	0.0318696
5 - 6	37.7387 / 35	0.0089673	0.0490016
6 - 7	23.2319 / 24	-0.157914	0.0879174

ERT4x4(AC)-BBCLL1, Odd, $x_F > 0.01$, Inclusive pseudorapidity, Eta Signal, lumi, Blue			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	35.0049 / 33	-0.0738352	0.0368219
3 - 4	29.5436 / 37	-0.0205515	0.0181712
4 - 5	28.0634 / 37	-0.0263757	0.0230171
5 - 6	26.4549 / 32	0.0430701	0.036458
6 - 7	18.3475 / 19	0.069648	0.0777082

ERT4x4(AC)-BBCLL1, Odd, $x_F > 0.01$, Inclusive pseudorapidity, Eta Signal, lumi, Yellow			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	21.1803 / 25	0.0460074	0.0595691
3 - 4	42.5597 / 37	-0.051548	0.0248052
4 - 5	54.2543 / 35	0.0235936	0.031666

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5 - 6	31.8941 / 27	0.00900225	0.0530857

ERT4x4(AC)-BBCLL1, Odd, $x_F > 0.01$, Inclusive pseudorapidity, Eta Background, sqrt, Blue

p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	30.9507 / 36	0.0566441	0.0368541
3 - 4	43.3677 / 37	0.00424336	0.0198352
4 - 5	32.0446 / 37	-0.0309061	0.0274986
5 - 12	38.817 / 36	-0.0197072	0.035867
5 - 12	38.817 / 36	-0.0197072	0.035867
5 - 12	38.817 / 36	-0.0197072	0.035867
5 - 12	38.817 / 36	-0.0197072	0.035867

ERT4x4(AC)-BBCLL1, Odd, $x_F > 0.01$, Inclusive pseudorapidity, Eta Background, sqrt, Yellow

p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	36.3016 / 33	-0.0166741	0.0531323
3 - 4	45.222 / 37	0.0133776	0.0262265
4 - 5	41.4914 / 36	0.0107881	0.0370642
5 - 12	32.0147 / 34	0.0647861	0.0503516
5 - 12	32.0147 / 34	0.0647861	0.0503516
5 - 12	32.0147 / 34	0.0647861	0.0503516
5 - 12	32.0147 / 34	0.0647861	0.0503516

ERT4x4(AC)-BBCLL1, Odd, $x_F > 0.01$, Inclusive pseudorapidity, Eta Background, lumi, Blue

p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	32.3035 / 34	0.0643446	0.0354325
3 - 4	47.4911 / 37	0.00779359	0.0191877
4 - 5	31.3125 / 35	-0.0324602	0.0271964
5 - 12	29.4615 / 33	-0.0428633	0.0361416
5 - 12	29.4615 / 33	-0.0428633	0.0361416
5 - 12	29.4615 / 33	-0.0428633	0.0361416
5 - 12	29.4615 / 33	-0.0428633	0.0361416

ERT4x4(AC)-BBCLL1, Odd, $x_F > 0.01$, Inclusive pseudorapidity, Eta Background, lumi, Yellow

p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	23.6979 / 25	-0.0407873	0.0576398
3 - 4	43.7025 / 37	0.0111756	0.0261342
4 - 5	40.3082 / 35	0.00882773	0.0369633
5 - 12	26.1122 / 25	0.0480017	0.0547514
5 - 12	26.1122 / 25	0.0480017	0.0547514
5 - 12	26.1122 / 25	0.0480017	0.0547514
5 - 12	26.1122 / 25	0.0480017	0.0547514

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B.4 Backward η

ERT4x4(AC)-BBCLL1, Even, Inclusive x_F, $\eta < -0.2$, pi0 Signal, sqrt, Blue			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
1 - 2	29.3609 / 37	0.00273968	0.00178135
2 - 3	30.1801 / 37	0.00219217	0.00216248
3 - 4	43.5495 / 37	-4.37225e-05	0.00459235
4 - 5	28.9721 / 37	-0.0108036	0.0100754
5 - 6	29.2137 / 34	0.0300773	0.0202853
6 - 7	18.6009 / 32	-0.00508092	0.0371958
7 - 8	27.9482 / 26	0.0952797	0.0634617

ERT4x4(AC)-BBCLL1, Even, Inclusive x_F, $\eta < -0.2$, pi0 Signal, sqrt, Yellow			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
1 - 2	45.8736 / 37	0.00097471	0.00177441
2 - 3	26.2995 / 37	0.00293864	0.00222375
3 - 4	34.9538 / 37	-0.00218009	0.00466737
4 - 5	58.3316 / 37	0.005683	0.0100188
5 - 6	31.9697 / 36	-0.0468226	0.0198556
6 - 7	34.1614 / 33	-0.0445015	0.0362149
7 - 8	43.5783 / 30	-0.0463252	0.0605416
8 - 9	12.4856 / 13	0.0146142	0.129

ERT4x4(AC)-BBCLL1, Even, Inclusive x_F, $\eta < -0.2$, pi0 Signal, lumi, Blue			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
1 - 2	27.1919 / 37	0.002833	0.0017683
2 - 3	31.117 / 37	0.00235882	0.00215844
3 - 4	43.7017 / 37	1.47878e-07	0.0045904
4 - 5	29.3355 / 37	-0.01069	0.0100643
5 - 6	28.6166 / 33	0.0308236	0.020233
6 - 7	16.976 / 29	-0.0138526	0.0375033
7 - 8	23.471 / 10	0.0113025	0.10321

ERT4x4(AC)-BBCLL1, Even, Inclusive x_F, $\eta < -0.2$, pi0 Signal, lumi, Yellow			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
1 - 2	44.2495 / 37	0.00103446	0.00171315
2 - 3	22.1953 / 37	0.002798	0.00215996
3 - 4	33.1642 / 37	-0.00181424	0.00457281
4 - 5	51.7768 / 37	0.0051513	0.00987452
5 - 6	27.0212 / 33	-0.0472073	0.0197014
6 - 7	34.3193 / 32	-0.042234	0.035961
7 - 8	32.2493 / 22	0.0490756	0.0691192

ERT4x4(AC)-BBCLL1, Even, Inclusive x_F, $\eta < -0.2$, pi0 Background, sqrt, Blue			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N

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1 - 2	30.2865 / 37	0.000906916	0.00232374
2 - 3	27.8307 / 37	0.00662628	0.0044347
3 - 4	35.2101 / 37	-0.00684606	0.0137463
4 - 5	22.961 / 33	-0.0190067	0.0345895
5 - 6	16.5866 / 21	-0.0342913	0.0817866

ERT4x4(AC)-BBCLL1, Even, Inclusive x_F, $\eta < -0.2$, pi0 Background, sqrt, Yellow			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
1 - 2	28.8209 / 37	-0.00161704	0.00232654
2 - 3	24.1437 / 37	0.00197444	0.00444866
3 - 4	43.8959 / 37	0.0127519	0.0133261
4 - 5	34.0631 / 33	0.000964831	0.0327832
5 - 6	35.7851 / 27	0.0617386	0.0717055
6 - 12	19.0839 / 16	0.181006	0.121347
6 - 12	19.0839 / 16	0.181006	0.121347
6 - 12	19.0839 / 16	0.181006	0.121347
6 - 12	19.0839 / 16	0.181006	0.121347
6 - 12	19.0839 / 16	0.181006	0.121347

ERT4x4(AC)-BBCLL1, Even, Inclusive x_F, $\eta < -0.2$, pi0 Background, lumi, Blue			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
1 - 2	30.3837 / 37	0.000790347	0.00231507
2 - 3	28.1339 / 37	0.00660618	0.00442744
3 - 4	38.7952 / 35	-0.0063307	0.0137546
4 - 5	22.6469 / 31	-0.0279572	0.0349006

ERT4x4(AC)-BBCLL1, Even, Inclusive x_F, $\eta < -0.2$, pi0 Background, lumi, Yellow			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
1 - 2	27.2747 / 37	-0.00266585	0.00226237
2 - 3	25.3168 / 37	0.00131984	0.00438284
3 - 4	45.0659 / 37	0.0116975	0.013244
4 - 5	36.4801 / 32	0.00229367	0.0324288
5 - 6	24.0799 / 20	0.0684235	0.0925087

ERT4x4(AC)-BBCLL1, Even, Inclusive x_F, $\eta < -0.2$, Eta Signal, sqrt, Blue			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	42.0871 / 37	0.0023396	0.00476001
3 - 4	33.2714 / 37	0.00290535	0.0110807
4 - 5	19.2703 / 33	-0.0254509	0.0243235
5 - 6	23.9534 / 29	-0.0530507	0.0480155

ERT4x4(AC)-BBCLL1, Even, Inclusive x_F, $\eta < -0.2$, Eta Signal, sqrt, Yellow			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	43.0777 / 37	0.00140587	0.00479859
3 - 4	22.5541 / 37	0.00204058	0.0113328
4 - 5	39.6366 / 35	-0.0267749	0.0241179
5 - 6	56.7989 / 32	-0.0305473	0.0468975
6 - 7	28.1605 / 22	-0.0159091	0.0897587

ERT4x4(AC)-BBCLL1, Even, Inclusive x_F, $\eta < -0.2$, Eta Signal, lumi, Blue			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	44.9152 / 37	0.00223822	0.00474596
3 - 4	31.4167 / 36	0.00226548	0.0110672
4 - 5	17.1058 / 33	-0.0287645	0.0242571
5 - 6	25.9969 / 25	-0.064562	0.0486849

ERT4x4(AC)-BBCLL1, Even, Inclusive x_F, $\eta < -0.2$, Eta Signal, lumi, Yellow			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	45.59 / 37	-0.000842957	0.00465262
3 - 4	24.6666 / 37	0.00775791	0.0110787
4 - 5	43.3216 / 33	-0.024336	0.0236964
5 - 6	59.7531 / 29	-0.0185134	0.0475243

ERT4x4(AC)-BBCLL1, Even, Inclusive x_F, $\eta < -0.2$, Eta Background, sqrt, Blue			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	28.7367 / 37	-0.00961083	0.00452208
3 - 4	35.6956 / 37	-0.00974728	0.0120029
4 - 5	37.161 / 33	0.00698687	0.0290847
5 - 12	26.0843 / 28	0.0553021	0.0500942
5 - 12	26.0843 / 28	0.0553021	0.0500942
5 - 12	26.0843 / 28	0.0553021	0.0500942
5 - 12	26.0843 / 28	0.0553021	0.0500942

ERT4x4(AC)-BBCLL1, Even, Inclusive x_F, $\eta < -0.2$, Eta Background, sqrt, Yellow			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	41.7837 / 37	0.00107353	0.00458369
3 - 4	55.9349 / 37	0.0172356	0.0122063
4 - 5	33.9973 / 33	-0.0154462	0.028714
5 - 12	17.4982 / 31	0.0185873	0.0486819
5 - 12	17.4982 / 31	0.0185873	0.0486819
5 - 12	17.4982 / 31	0.0185873	0.0486819
5 - 12	17.4982 / 31	0.0185873	0.0486819

ERT4x4(AC)-BBCLL1, Even, Inclusive x_F, $\eta < -0.2$, Eta Background, lumi, Blue			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	28.8418 / 37	-0.00986258	0.00451586
3 - 4	37.3953 / 36	-0.0101816	0.0119971
4 - 5	36.5861 / 32	0.00696289	0.0289819
5 - 12	17.5637 / 24	0.100288	0.0530792
5 - 12	17.5637 / 24	0.100288	0.0530792
5 - 12	17.5637 / 24	0.100288	0.0530792
5 - 12	17.5637 / 24	0.100288	0.0530792

ERT4x4(AC)-BBCLL1, Even, Inclusive x_F, $\eta < -0.2$, Eta Background, lumi, Yellow			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	43.8526 / 37	0.000719005	0.00442464
3 - 4	56.4349 / 37	0.0158423	0.0119674
4 - 5	36.4821 / 32	-0.0159515	0.028305
5 - 12	13.4519 / 30	0.0214477	0.0485294
5 - 12	13.4519 / 30	0.0214477	0.0485294
5 - 12	13.4519 / 30	0.0214477	0.0485294
5 - 12	13.4519 / 30	0.0214477	0.0485294

ERT4x4(AC)-BBCLL1, Odd, Inclusive x_F, $\eta < -0.2$, pi0 Signal, sqrt, Blue			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
1 - 2	39.8679 / 37	3.5028e-06	0.00169515
2 - 3	43.0809 / 37	-0.000828398	0.00207697
3 - 4	56.0401 / 37	0.000727088	0.00444198
4 - 5	36.0035 / 37	0.00140528	0.00974593
5 - 6	21.5577 / 37	0.0106464	0.0196283
6 - 7	46.4175 / 35	0.0101383	0.0356695
7 - 8	27.3014 / 26	0.186053	0.0633655

ERT4x4(AC)-BBCLL1, Odd, Inclusive x_F, $\eta < -0.2$, pi0 Signal, sqrt, Yellow			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
1 - 2	32.4529 / 37	-1.95e-05	0.00167781
2 - 3	45.5002 / 37	0.000642642	0.00212914
3 - 4	30.733 / 37	-0.00141677	0.0044984
4 - 5	38.4109 / 37	-0.00533906	0.00967658
5 - 6	40.5934 / 37	-0.0101776	0.0192975
6 - 7	61.8356 / 37	0.00801395	0.0345623
7 - 8	19.1839 / 29	0.017899	0.0616837
8 - 9	22.7359 / 17	-0.0226616	0.11232

ERT4x4(AC)-BBCLL1, Odd, Inclusive x_F, $\eta < -0.2$, pi0 Signal, lumi, Blue			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N

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1 - 2	41.1433 / 37	1.73781e-05	0.00168372
2 - 3	43.1133 / 37	-0.000933258	0.00207251
3 - 4	56.2092 / 37	0.000752534	0.00443996
4 - 5	36.1232 / 37	0.000981355	0.00973462
5 - 6	23.4979 / 37	0.0100828	0.0195813
6 - 7	45.9012 / 31	0.00196227	0.0363419

ERT4x4(AC)-BBCLL1, Odd, Inclusive x_F, $\eta < -0.2$, pi0 Signal, lumi, Yellow

p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
1 - 2	32.6539 / 37	0.00088938	0.00162711
2 - 3	44.5003 / 37	0.000402252	0.0020697
3 - 4	27.6214 / 37	-0.00114872	0.00440433
4 - 5	39.4263 / 37	-0.00658862	0.00953022
5 - 6	41.7381 / 37	-0.00960762	0.018998
6 - 7	49.978 / 34	0.0095004	0.03457
7 - 8	21.6617 / 25	0.0701771	0.0664858

ERT4x4(AC)-BBCLL1, Odd, Inclusive x_F, $\eta < -0.2$, pi0 Background, sqrt, Blue

p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
1 - 2	19.6534 / 37	-0.00321404	0.0022146
2 - 3	42.6783 / 37	0.00178716	0.00426525
3 - 4	35.6685 / 37	0.00694709	0.0133358
4 - 5	30.9695 / 36	-0.00648057	0.0331823
5 - 6	24.1503 / 22	0.0251063	0.0782043

ERT4x4(AC)-BBCLL1, Odd, Inclusive x_F, $\eta < -0.2$, pi0 Background, sqrt, Yellow

p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
1 - 2	32.2145 / 37	-0.00032184	0.0022025
2 - 3	44.6991 / 37	-0.00322233	0.00426803
3 - 4	39.4352 / 37	-0.000512977	0.0128396
4 - 5	38.9473 / 37	-0.0125216	0.0313964
5 - 6	20.8375 / 26	0.0827815	0.0712151
6 - 12	8.56972 / 14	0.0501546	0.135958
6 - 12	8.56972 / 14	0.0501546	0.135958
6 - 12	8.56972 / 14	0.0501546	0.135958
6 - 12	8.56972 / 14	0.0501546	0.135958
6 - 12	8.56972 / 14	0.0501546	0.135958

ERT4x4(AC)-BBCLL1, Odd, Inclusive x_F, $\eta < -0.2$, pi0 Background, lumi, Blue

p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
1 - 2	19.4077 / 37	-0.00329229	0.0022067
2 - 3	42.9344 / 37	0.0017158	0.00425817

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3 - 4	35.301 / 37	0.00697292	0.0133072
4 - 5	27.6523 / 33	-0.0164097	0.0333861

ERT4x4(AC)-BBCLL1, Odd, Inclusive x_F, $\eta < -0.2$, pi0 Background, lumi, Yellow

p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
1 - 2	30.4209 / 37	-0.00034947	0.00215007
2 - 3	44.7328 / 37	-0.00324605	0.00420892
3 - 4	40.3195 / 37	0.00115527	0.0127583
4 - 5	36.4743 / 36	-0.014941	0.031096
5 - 6	10.4078 / 20	-0.0260072	0.0876214

ERT4x4(AC)-BBCLL1, Odd, Inclusive x_F, $\eta < -0.2$, Eta Signal, sqrt, Blue

p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	34.9426 / 37	9.442e-05	0.00458288
3 - 4	48.9839 / 37	-0.0113411	0.0106897
4 - 5	40.4112 / 37	0.0141952	0.0235692
5 - 6	34.7547 / 33	0.0266076	0.0462225

ERT4x4(AC)-BBCLL1, Odd, Inclusive x_F, $\eta < -0.2$, Eta Signal, sqrt, Yellow

p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	36.4579 / 37	-0.00352115	0.00460818
3 - 4	28.602 / 37	0.00966756	0.0109364
4 - 5	30.0418 / 37	-0.00241335	0.0235019
5 - 6	35.7956 / 35	0.0415767	0.0449881
6 - 7	18.799 / 22	0.135713	0.0893386

ERT4x4(AC)-BBCLL1, Odd, Inclusive x_F, $\eta < -0.2$, Eta Signal, lumi, Blue

p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	35.693 / 37	-9.38936e-05	0.00457066
3 - 4	48.4594 / 37	-0.0108995	0.0106751
4 - 5	41.3258 / 35	0.0143643	0.0235761
5 - 6	29.8838 / 25	0.0386105	0.0493678

ERT4x4(AC)-BBCLL1, Odd, Inclusive x_F, $\eta < -0.2$, Eta Signal, lumi, Yellow

p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	41.4982 / 37	-0.00262799	0.00446362
3 - 4	28.724 / 37	0.00935887	0.0106797
4 - 5	30.6438 / 37	-0.000898301	0.0229932
5 - 6	33.2802 / 29	0.0536738	0.0470166

ERT4x4(AC)-BBCLL1, Odd, Inclusive x_F, $\eta < -0.2$, Eta Background, sqrt, Blue

p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N

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2 - 3	29.5981 / 37	0.00327668	0.00434146
3 - 4	38.5453 / 37	-0.0129542	0.0116511
4 - 5	26.7554 / 37	0.0576296	0.0276292
5 - 12	37.1853 / 32	-0.0481844	0.0491165
5 - 12	37.1853 / 32	-0.0481844	0.0491165
5 - 12	37.1853 / 32	-0.0481844	0.0491165
5 - 12	37.1853 / 32	-0.0481844	0.0491165

ERT4x4(AC)-BBCLL1, Odd, Inclusive x_F, $\eta < -0.2$, Eta Background, sqrt, Yellow			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	33.8048 / 37	-0.00273798	0.00439181
3 - 4	41.0239 / 37	0.000761209	0.0117823
4 - 5	43.4744 / 37	0.0221624	0.0277114
5 - 12	33.9353 / 34	0.0885815	0.0475039
5 - 12	33.9353 / 34	0.0885815	0.0475039
5 - 12	33.9353 / 34	0.0885815	0.0475039
5 - 12	33.9353 / 34	0.0885815	0.0475039

ERT4x4(AC)-BBCLL1, Odd, Inclusive x_F, $\eta < -0.2$, Eta Background, lumi, Blue			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	30.9928 / 37	0.0035093	0.00433669
3 - 4	38.6746 / 37	-0.0125867	0.0116323
4 - 5	28.9117 / 36	0.0549822	0.0274957
5 - 12	30.3933 / 25	-0.0383784	0.0531052
5 - 12	30.3933 / 25	-0.0383784	0.0531052
5 - 12	30.3933 / 25	-0.0383784	0.0531052
5 - 12	30.3933 / 25	-0.0383784	0.0531052

ERT4x4(AC)-BBCLL1, Odd, Inclusive x_F, $\eta < -0.2$, Eta Background, lumi, Yellow			
p_T bin (GeV/c)	χ^2/NDF	A_N	δA_N
2 - 3	34.5353 / 37	-0.00463788	0.0042439
3 - 4	43.0211 / 37	0.00394728	0.0115388
4 - 5	36.724 / 37	0.0204266	0.0273076
5 - 12	26.6101 / 27	0.105048	0.0498177
5 - 12	26.6101 / 27	0.105048	0.0498177
5 - 12	26.6101 / 27	0.105048	0.0498177
5 - 12	26.6101 / 27	0.105048	0.0498177

B.5 Forward η

C Comparison of raw A_N values

C.1 Inclusive

C.1.1 $A_N^{\pi^0 signal+background}$

C.1.2 $A_N^{\pi^0 background}$

C.1.3 $A_N^{\eta signal+background}$

C.1.4 $A_N^{\eta background}$

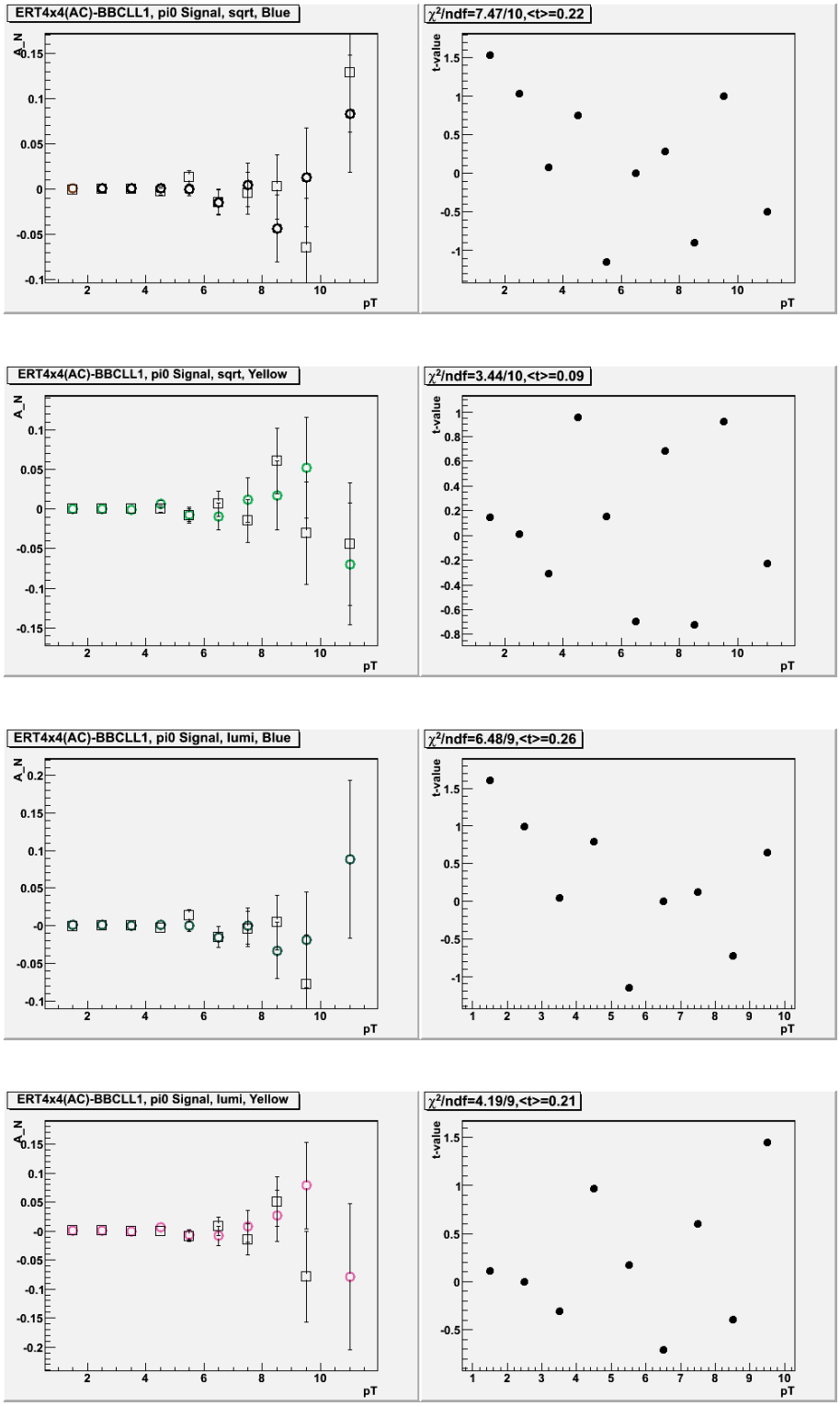

Figure 39: Inclusive selection, Even odd comparison of asymmetries for π^0 mass window. Top to bottom: sqrt formula+blue beam, sqrt formula+yellow beam, lumi formula+blue beam, lumi formula+yellow beam

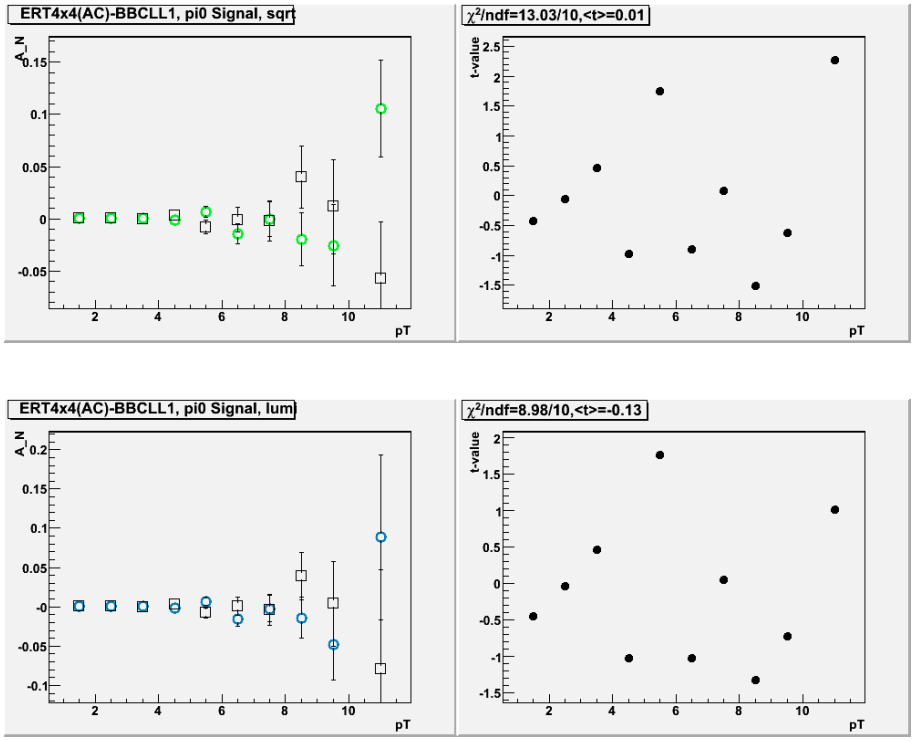

Figure 40: Inclusive selection, Blue yellow comparison of even/odd combined asymmetries for π^0 mass window. Top to bottom: sqrt, lumi

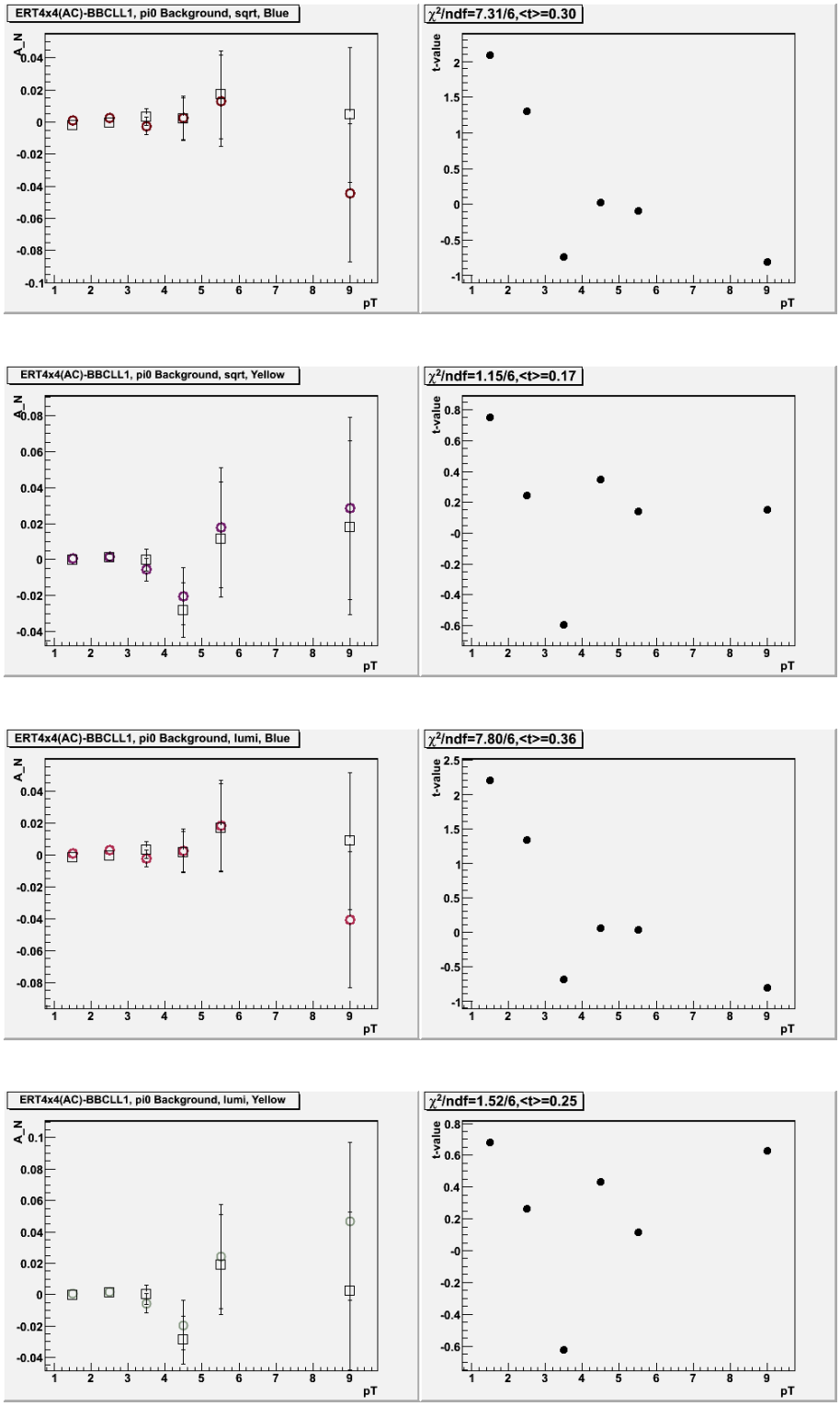

Figure 41: Inclusive selection, Even odd comparison of asymmetries for π^0 background mass window. Top to bottom: sqrt formula+blue beam, sqrt formula+yellow beam, lumi formula+blue beam, lumi formula+yellow beam

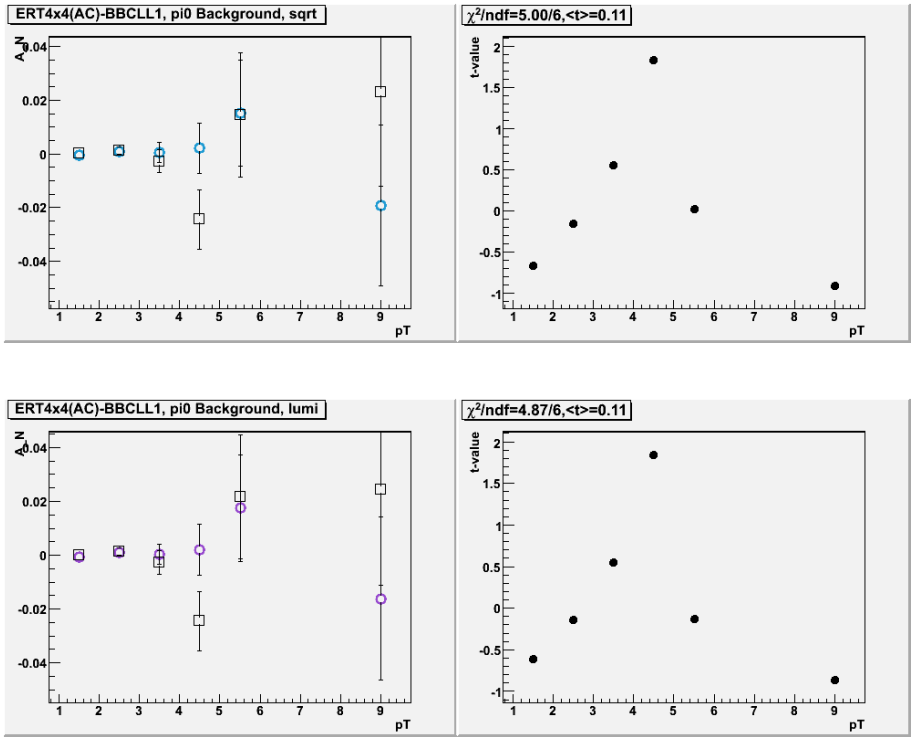

Figure 42: Inclusive selection, Blue yellow comparison of even/odd combined asymmetries for π^0 background mass window. Top to bottom: sqrt, lumi

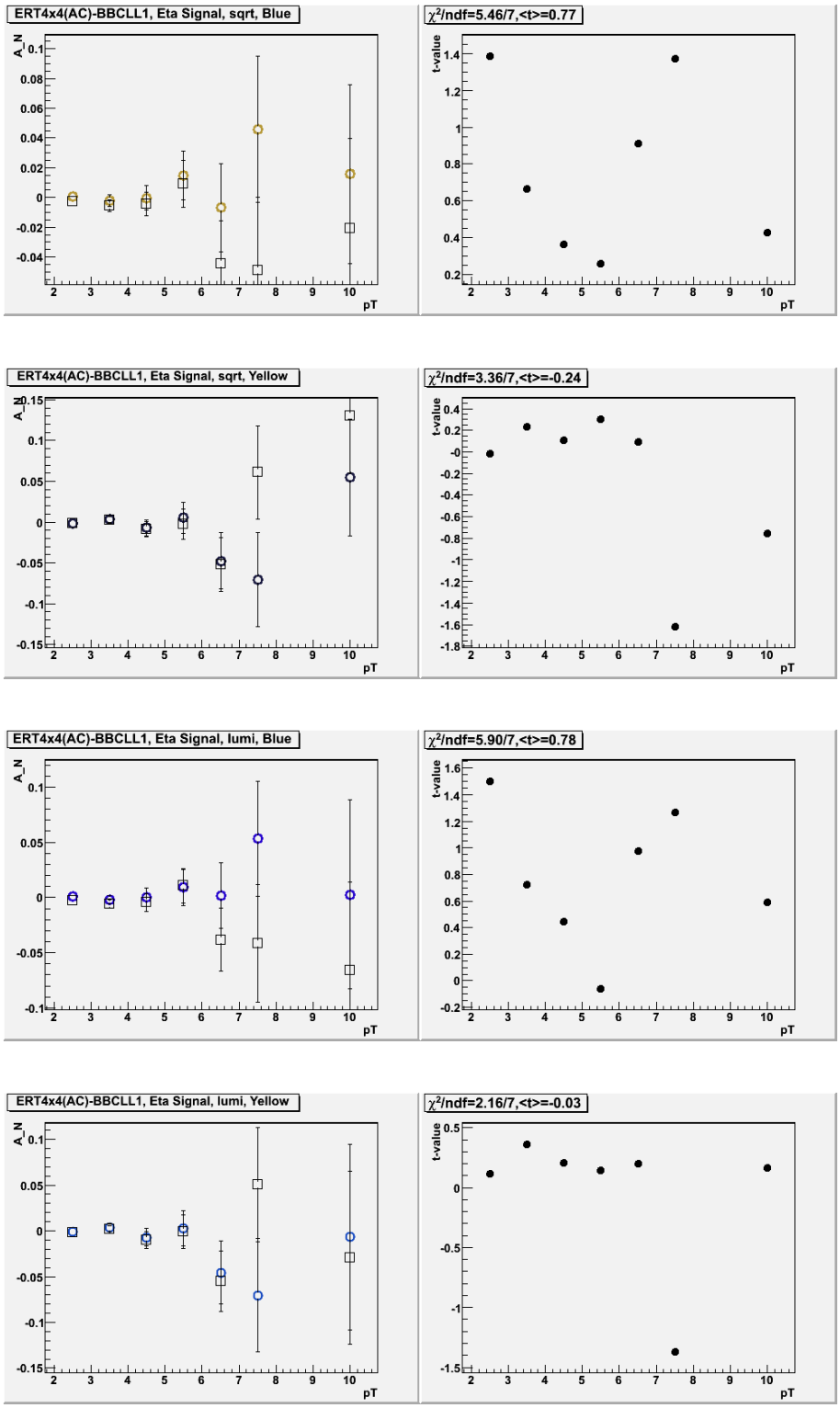

Figure 43: Inclusive selection, Even odd comparison of asymmetries for η mass window. Top to bottom: sqrt formula+blue beam, sqrt formula+yellow beam, lumi formula+blue beam, lumi formula+yellow beam

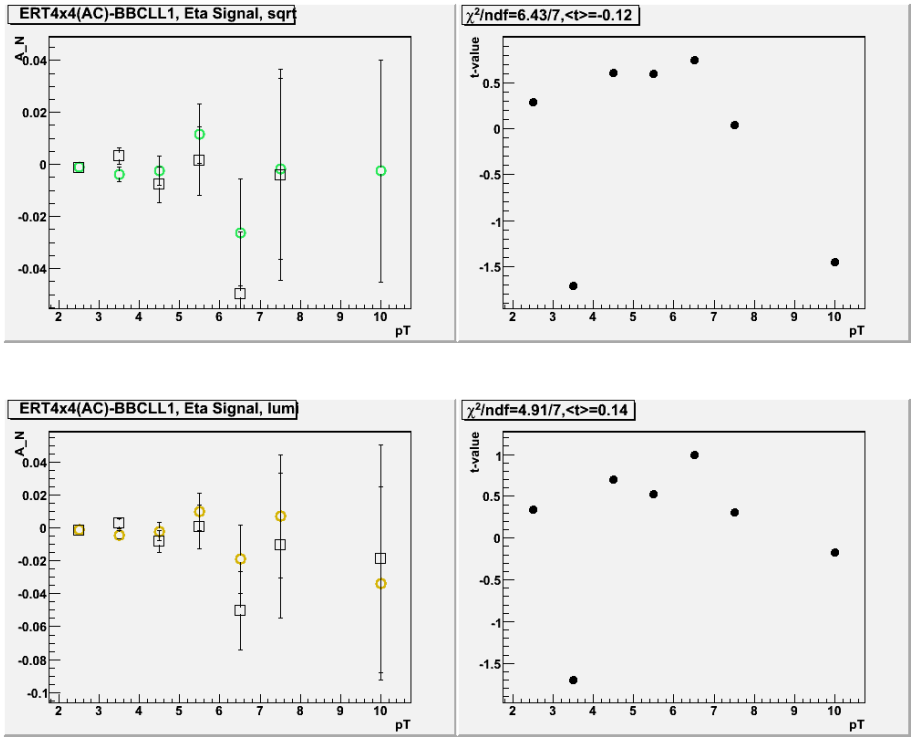

Figure 44: Inclusive selection, Blue yellow comparison of even/odd combined asymmetries for η mass window. Top to bottom: sqrt, lumi

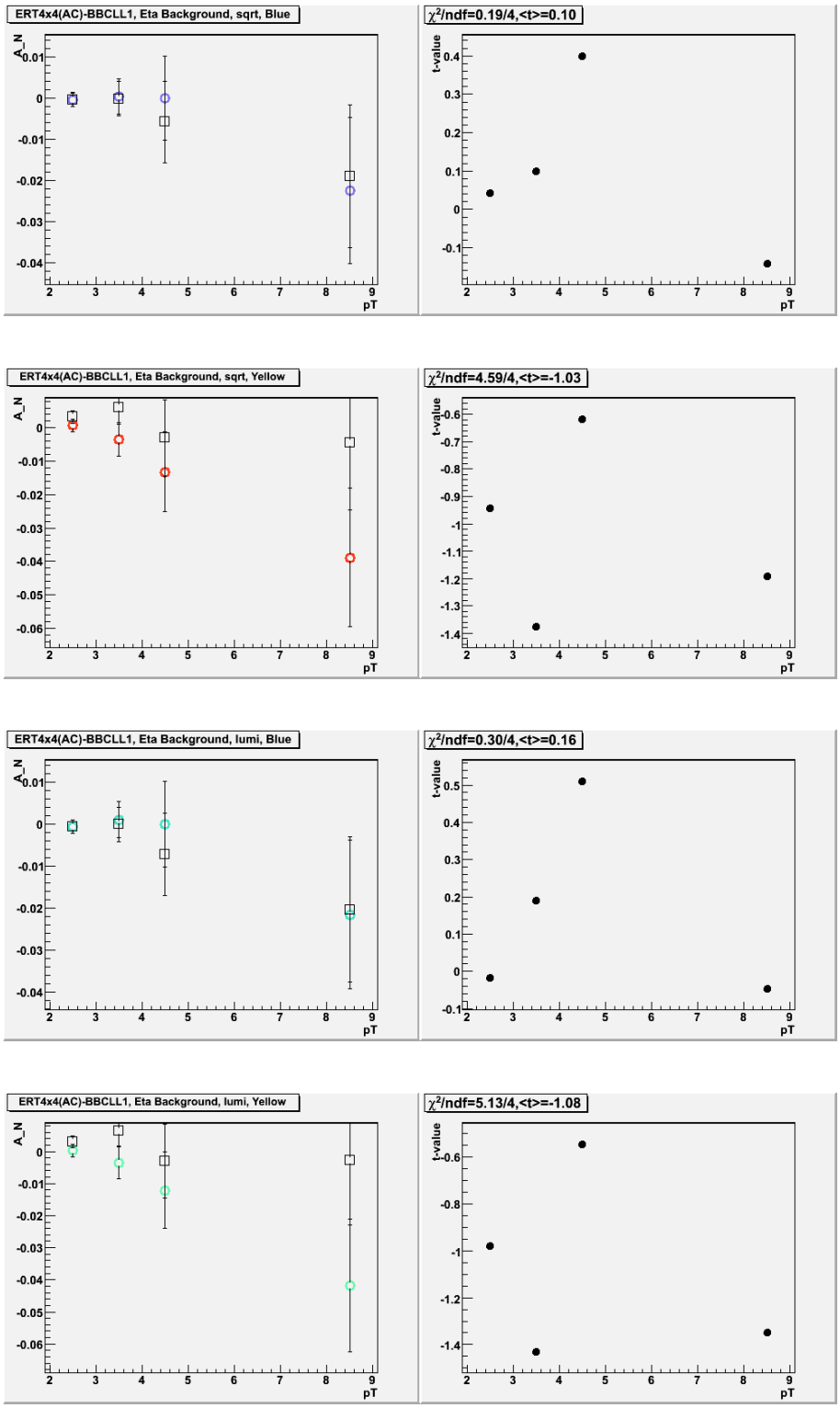

Figure 45: Inclusive selection, Even odd comparison of asymmetries for η background mass window. Top to bottom: sqrt formula+blue beam, sqrt formula+yellow beam, lumi formula+blue beam, lumi formula+yellow beam

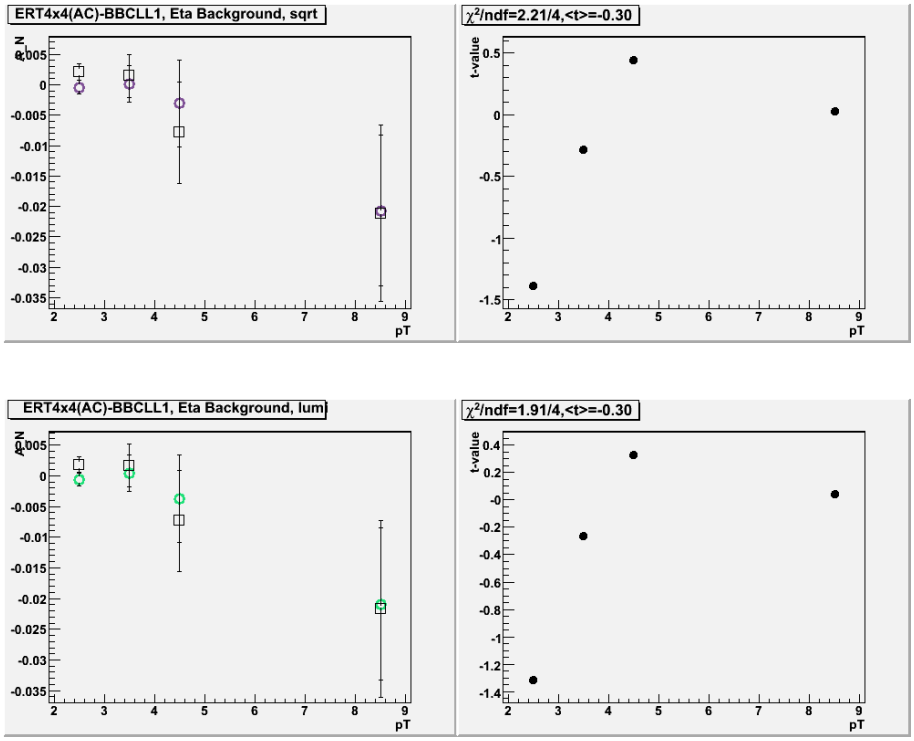

Figure 46: Inclusive selection, Blue yellow comparison of even/odd combined asymmetries for η background mass window. Top to bottom: sqrt, lumi

C.2 Backward x_F

C.2.1 $A_N^{\pi^0 signal+background}$

C.2.2 $A_N^{\pi^0 background}$

C.2.3 $A_N^{\eta signal+background}$

C.2.4 $A_N^{\eta background}$

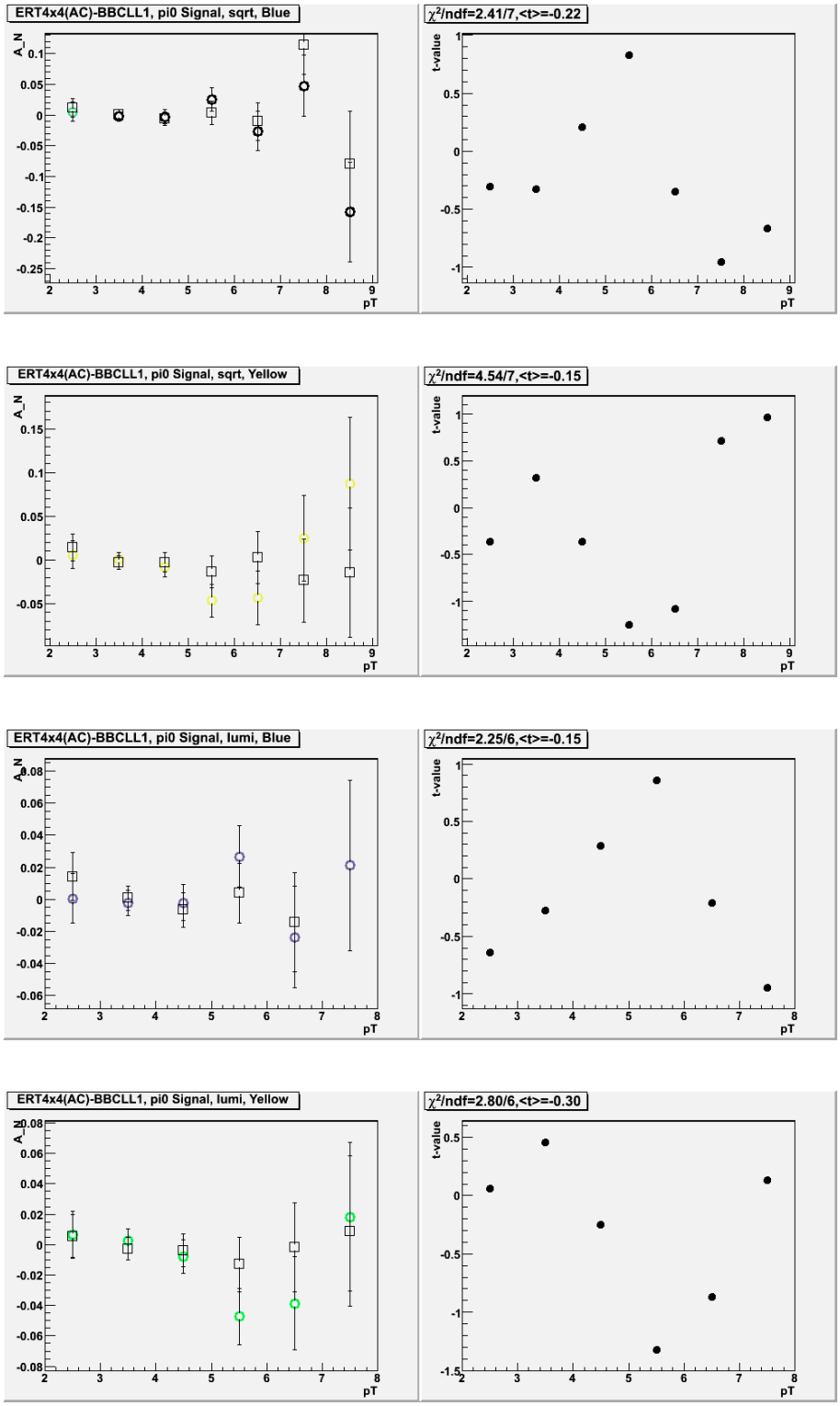

Figure 47: x_F <-0.01, Even odd comparison of asymmetries for π^0 mass window. Top to bottom: sqrt formula+blue beam, sqrt formula+yellow beam, lumi formula+blue beam, lumi formula+yellow beam

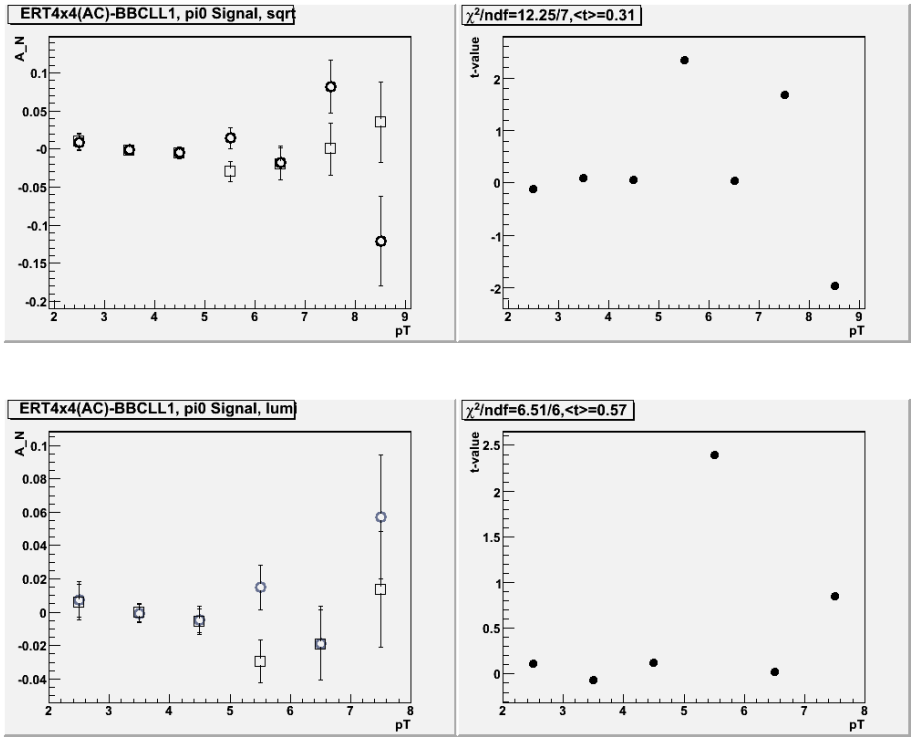

Figure 48: x_F <-0.01 selection, Blue yellow comparison of even/odd combined asymmetries for π^0 mass window. Top to bottom: sqrt, lumi

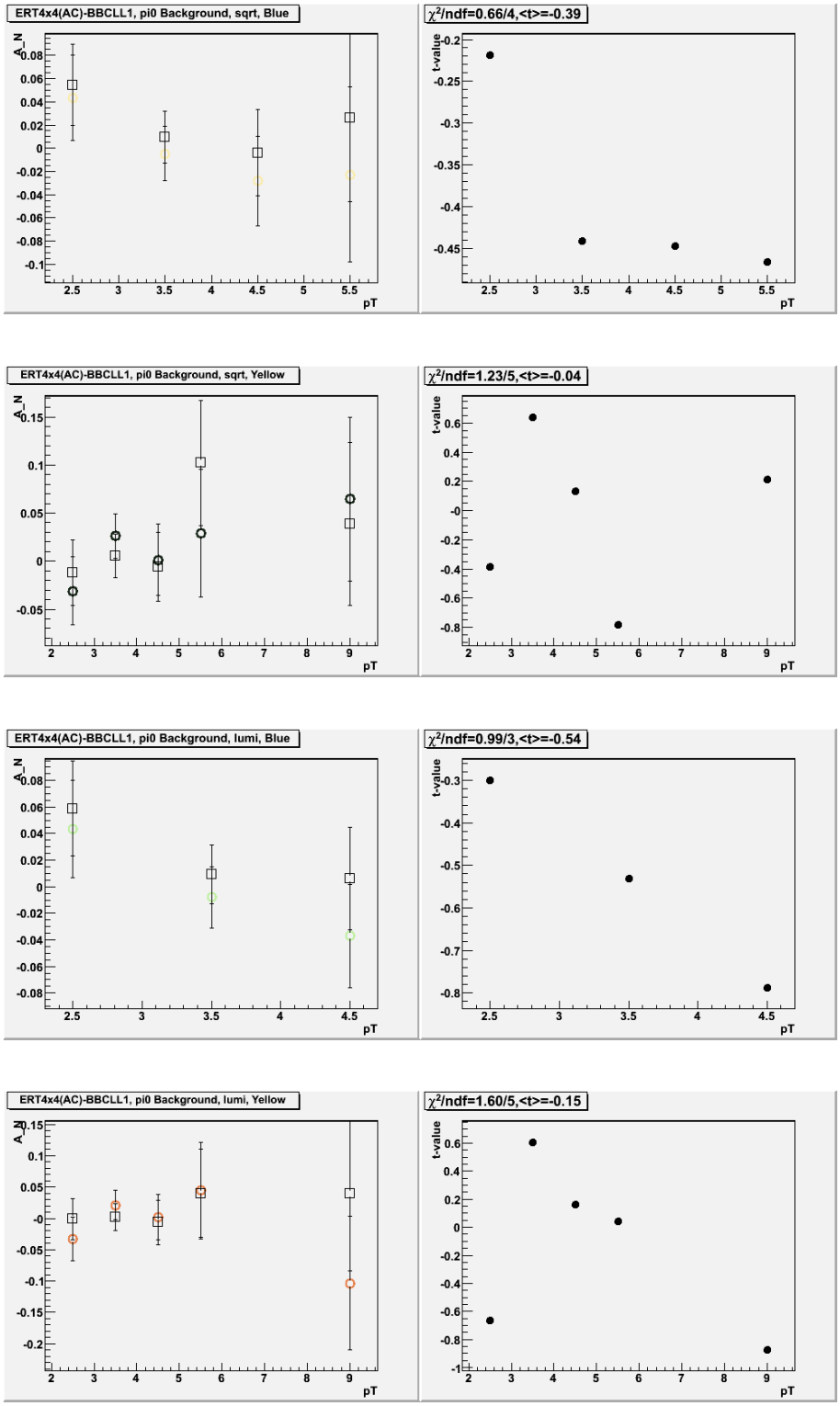

Figure 49: x_F <-0.01 selection, Even odd comparison of asymmetries for π^0 background mass window. Top to bottom: sqrt formula+blue beam, sqrt formula+yellow beam, lumi formula+blue beam, lumi formula+yellow beam

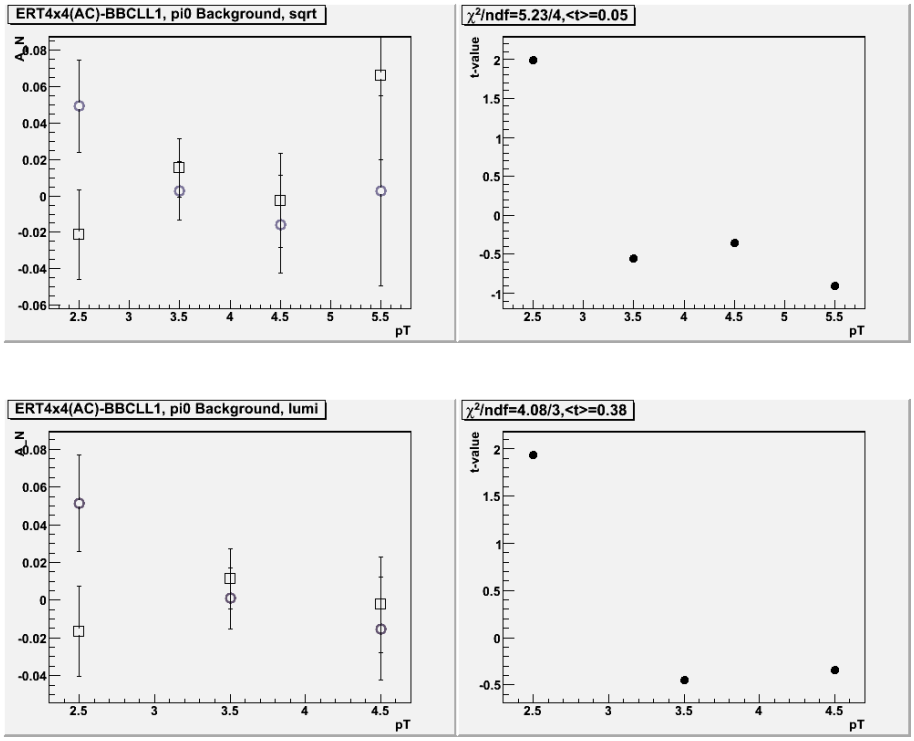

Figure 50: x_F <-0.01 selection, Blue yellow comparison of even/odd combined asymmetries for π^0 background mass window. Top to bottom: sqrt, lumi

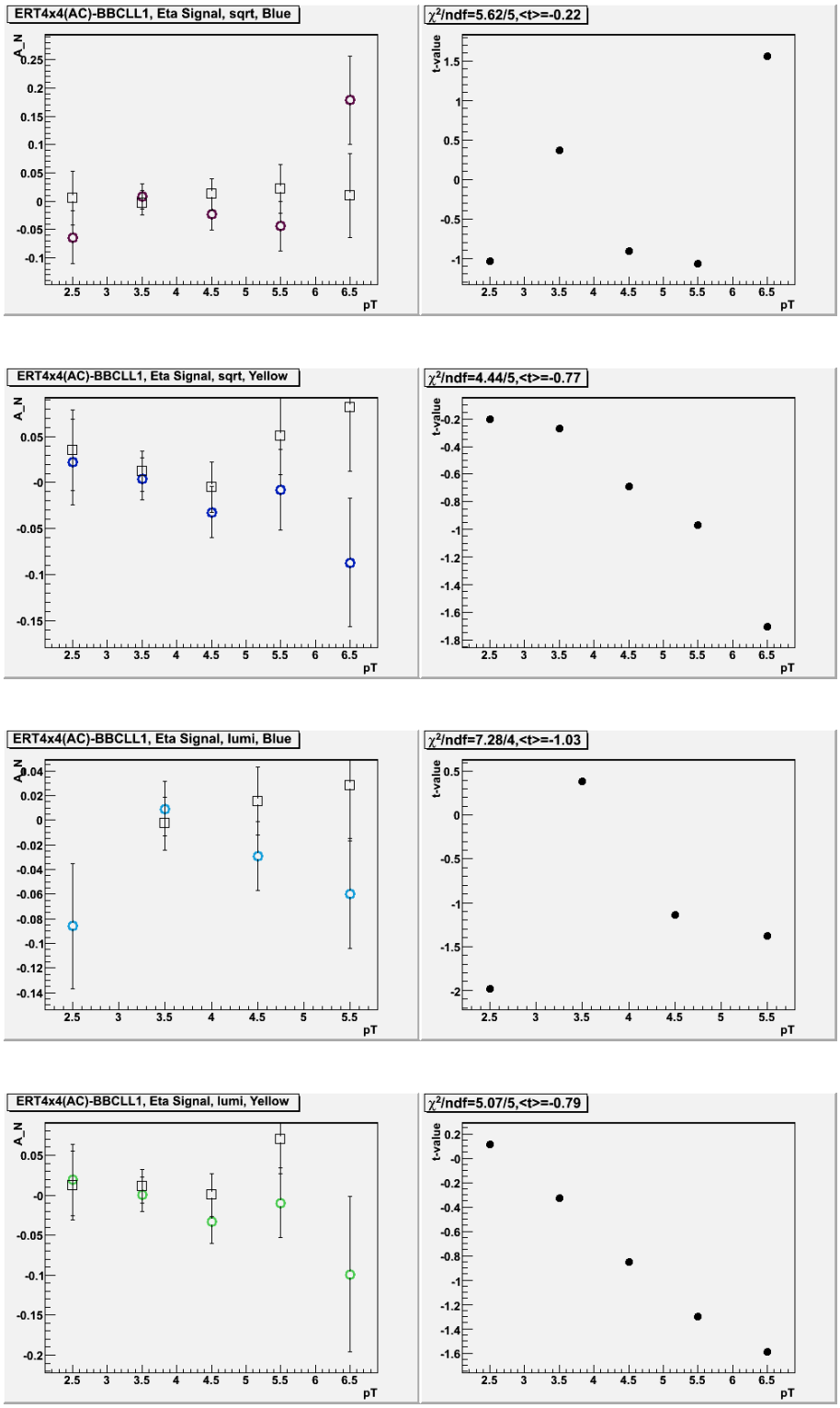

Figure 51: x_F <-0.01 selection, Even odd comparison of asymmetries for η mass window. Top to bottom: sqrt formula+blue beam, sqrt formula+yellow beam, lumi formula+blue beam, lumi formula+yellow beam

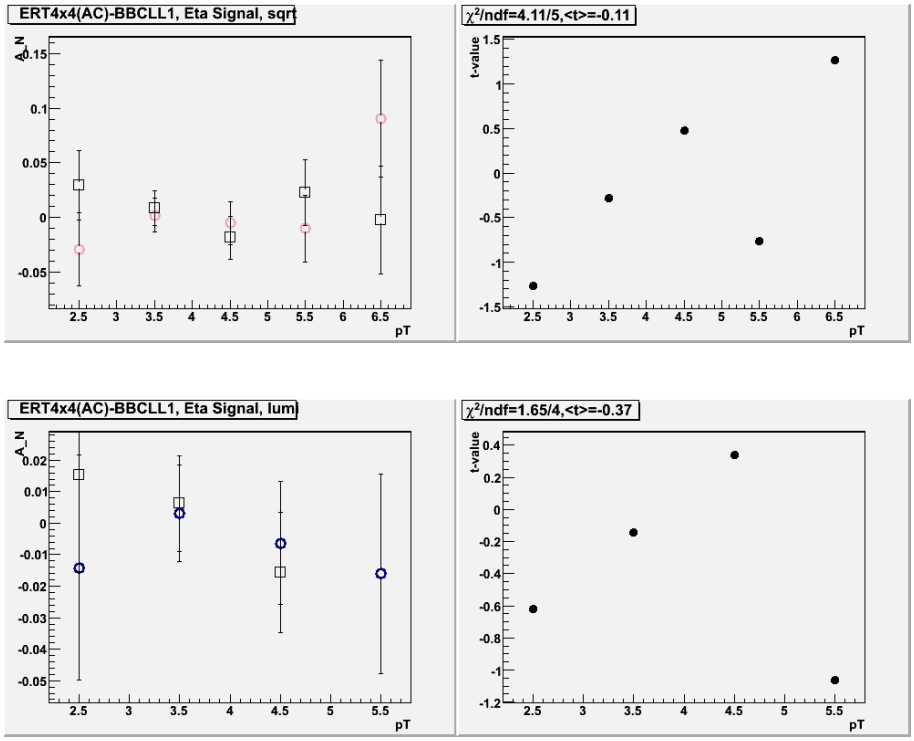

Figure 52: x_F <-0.01 selection, Blue yellow comparison of even/odd combined asymmetries for η mass window. Top to bottom: sqrt, lumi

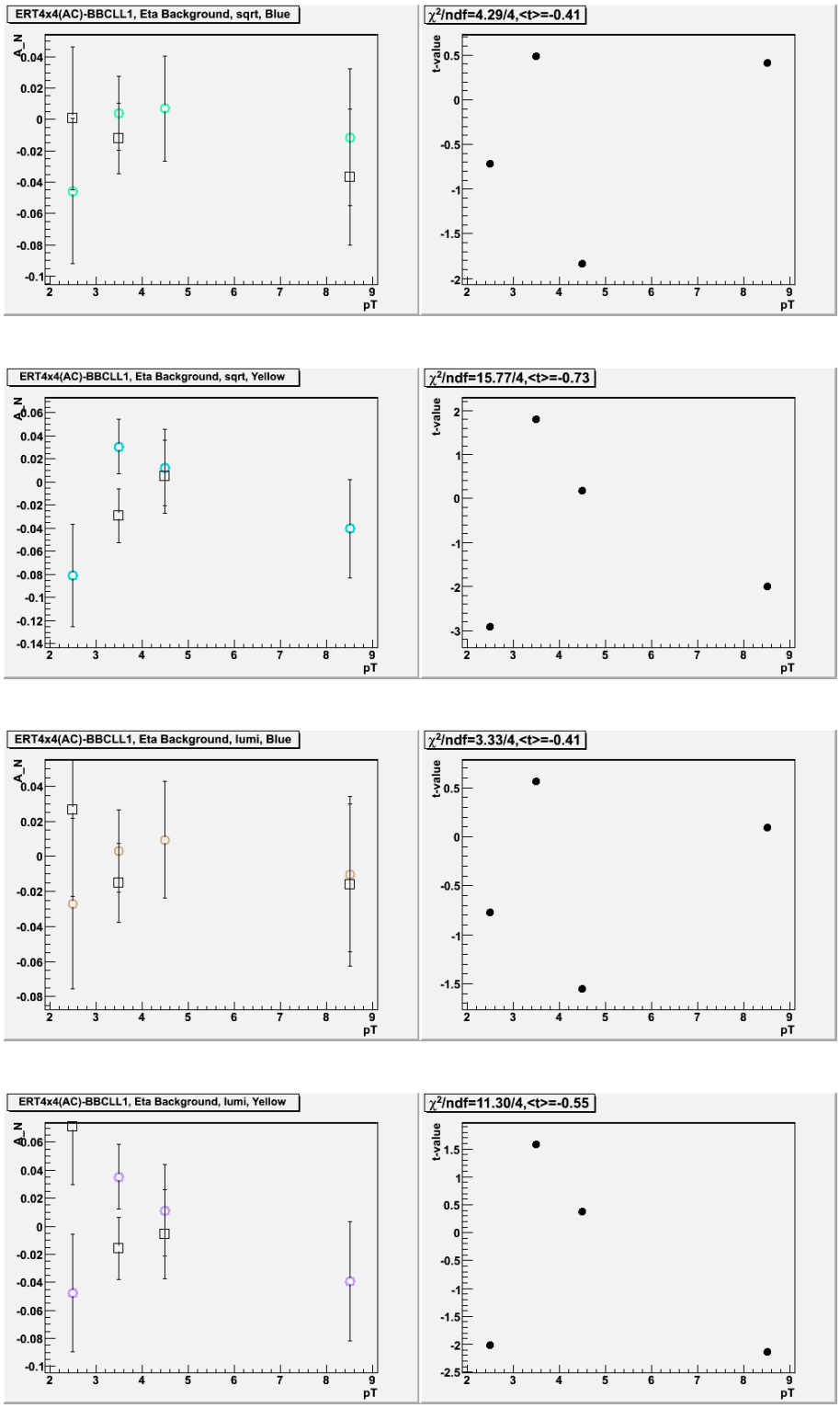

Figure 53: x_F <-0.01 selection, Even odd comparison of asymmetries for η background mass window. Top to bottom: sqrt formula+blue beam, sqrt formula+yellow beam, lumi formula+blue beam, lumi formula+yellow beam

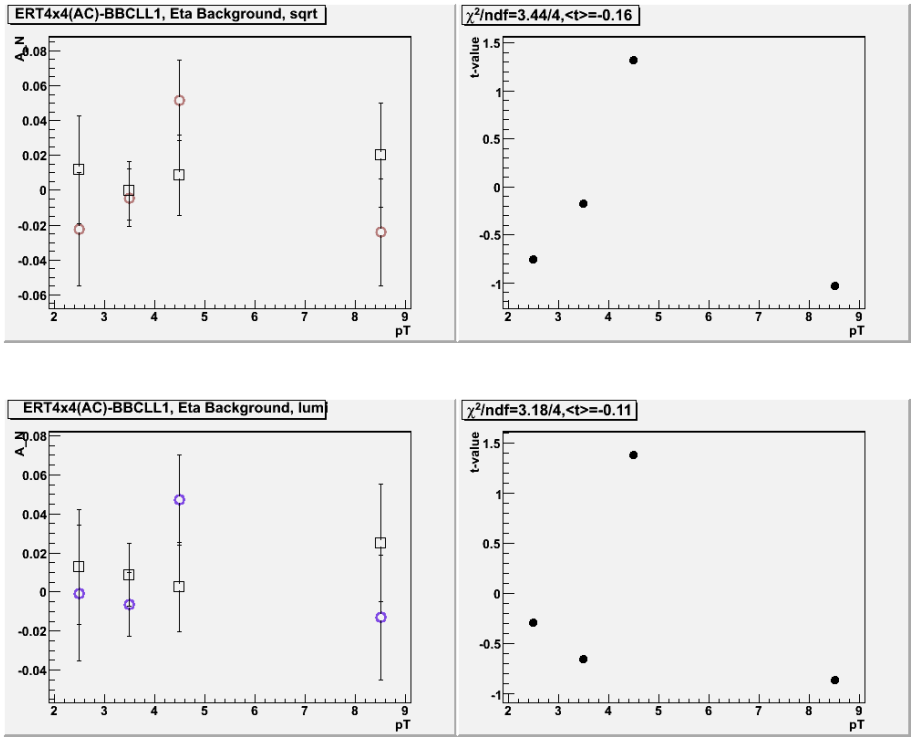

Figure 54: x_F <-0.01 selection, Blue yellow comparison of even/odd combined asymmetries for η background mass window. Top to bottom: sqrt, lumi

C.3 Forward x_F

C.3.1 $A_N^{\pi^0 signal+background}$

C.3.2 $A_N^{\pi^0 background}$

C.3.3 $A_N^{\eta signal+background}$

C.3.4 $A_N^{\eta background}$

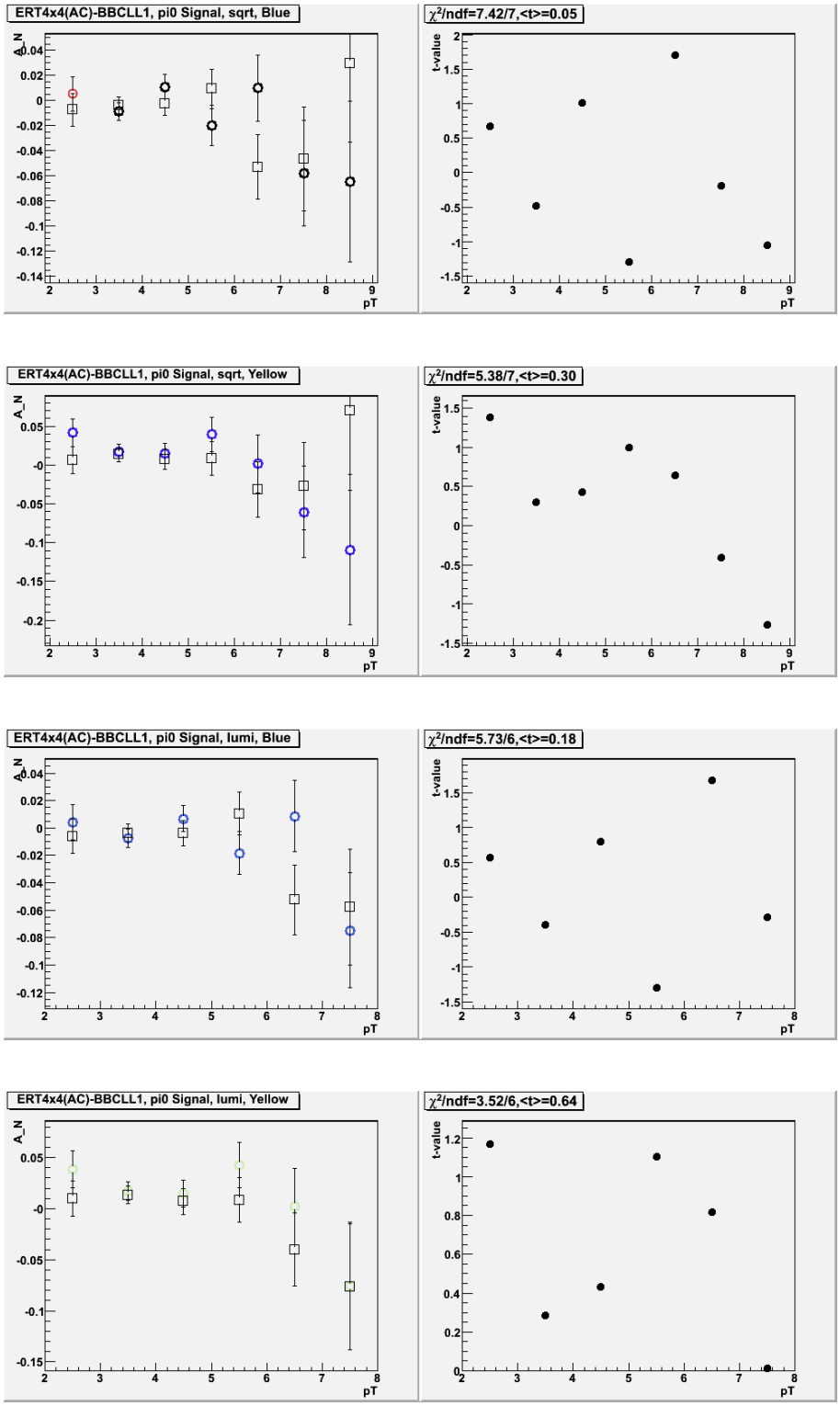

Figure 55: x_F >0.02, Even odd comparison of asymmetries for π^0 mass window. Top to bottom: sqrt formula+blue beam, sqrt formula+yellow beam, lumi formula+blue beam, lumi formula+yellow beam

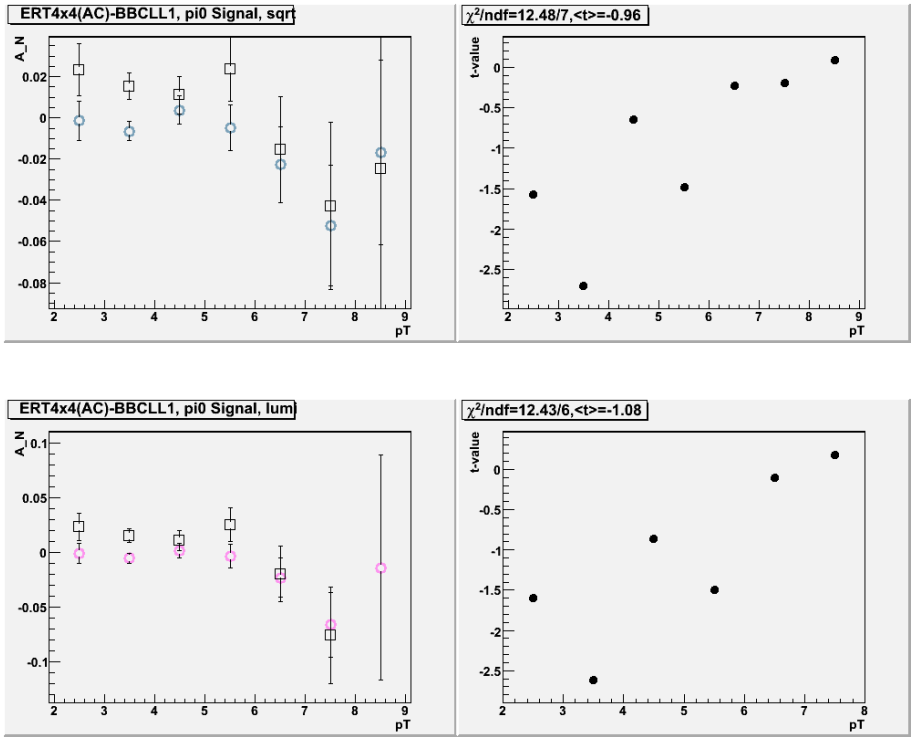

Figure 56: x_F >0.01 selection, Blue yellow comparison of even/odd combined asymmetries for π^0 mass window. Top to bottom: sqrt, lumi

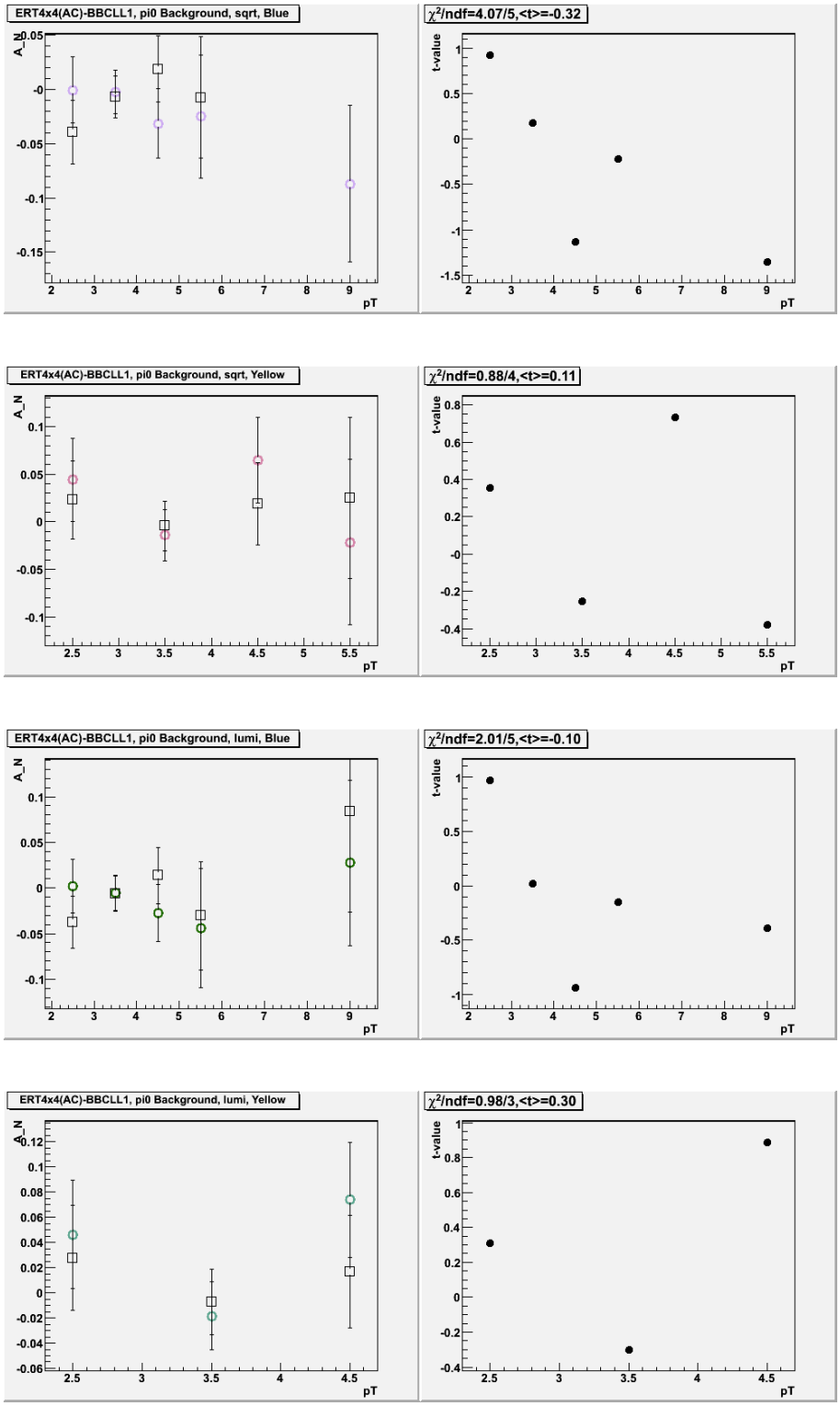

Figure 57: x_F >0.01 selection, Even odd comparison of asymmetries for π^0 background mass window. Top to bottom: sqrt formula+blue beam, sqrt formula+yellow beam, lumi formula+blue beam, lumi formula+yellow beam

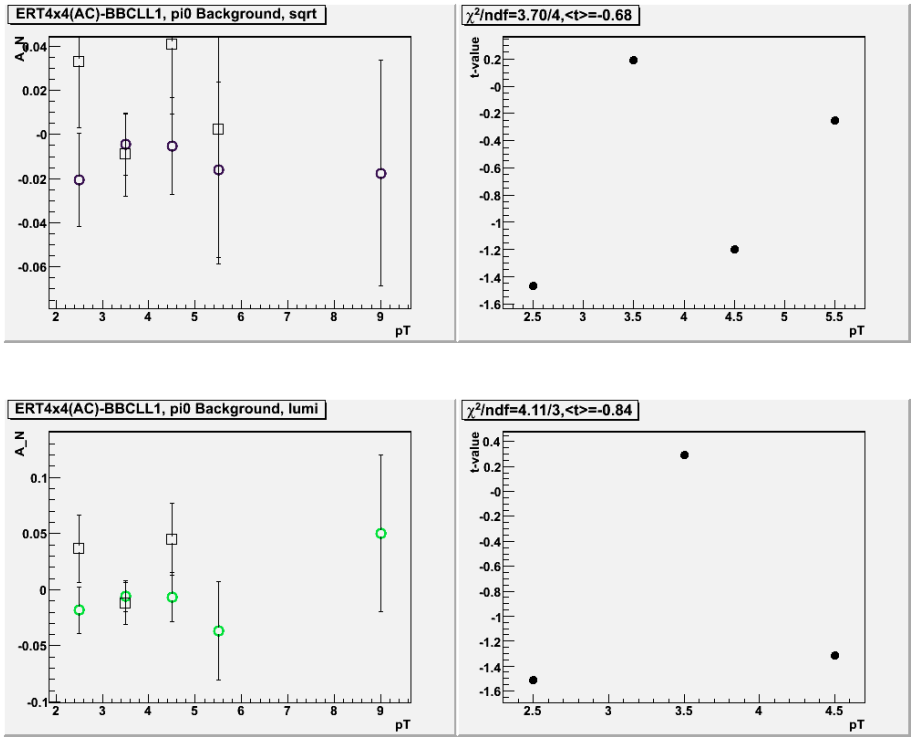

Figure 58: x_F >0.01 selection, Blue yellow comparison of even/odd combined asymmetries for π^0 background mass window. Top to bottom: sqrt, lumi

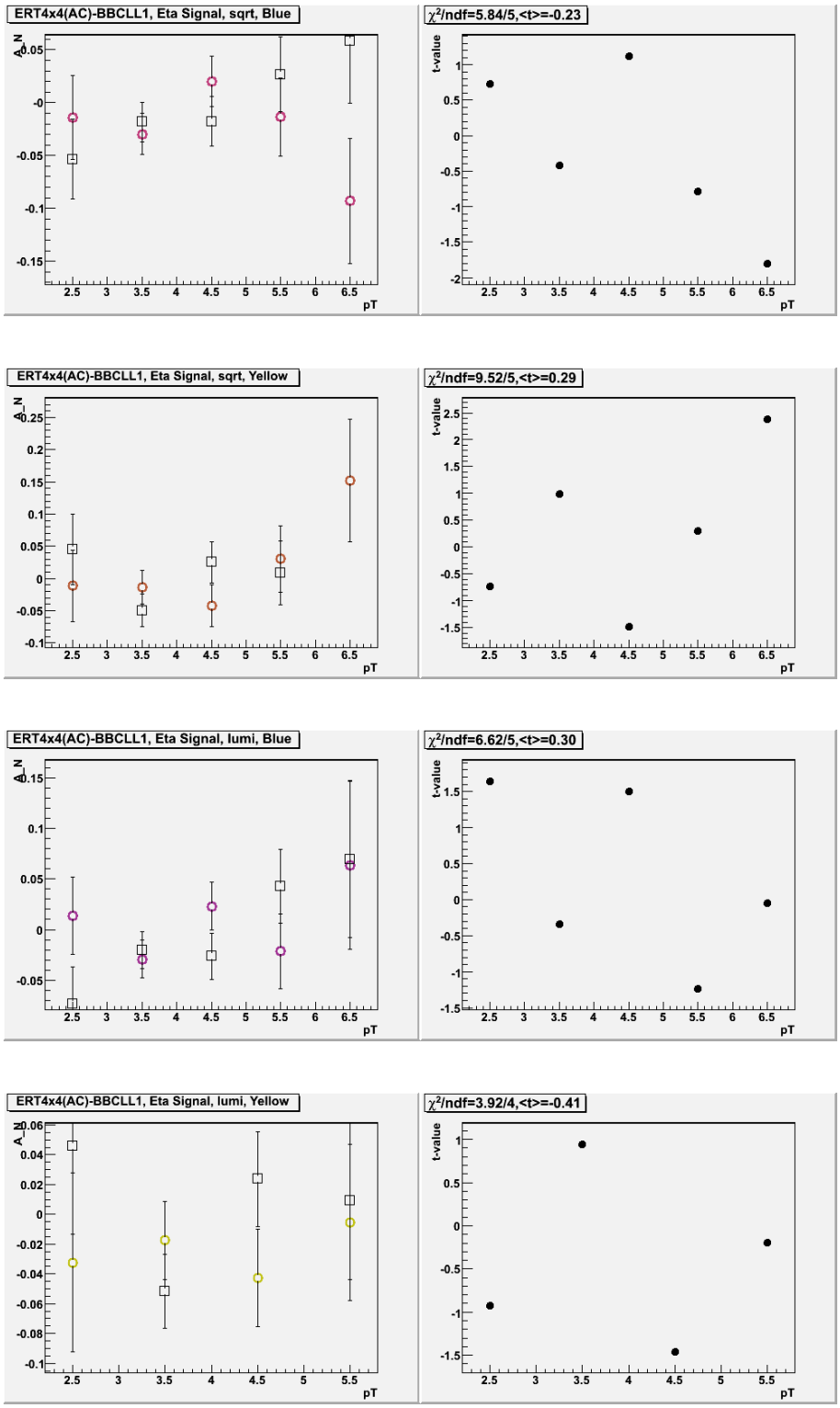

Figure 59: x_F >0.01 selection, Even odd comparison of asymmetries for η mass window. Top to bottom: sqrt formula+blue beam, sqrt formula+yellow beam, lumi formula+blue beam, lumi formula+yellow beam

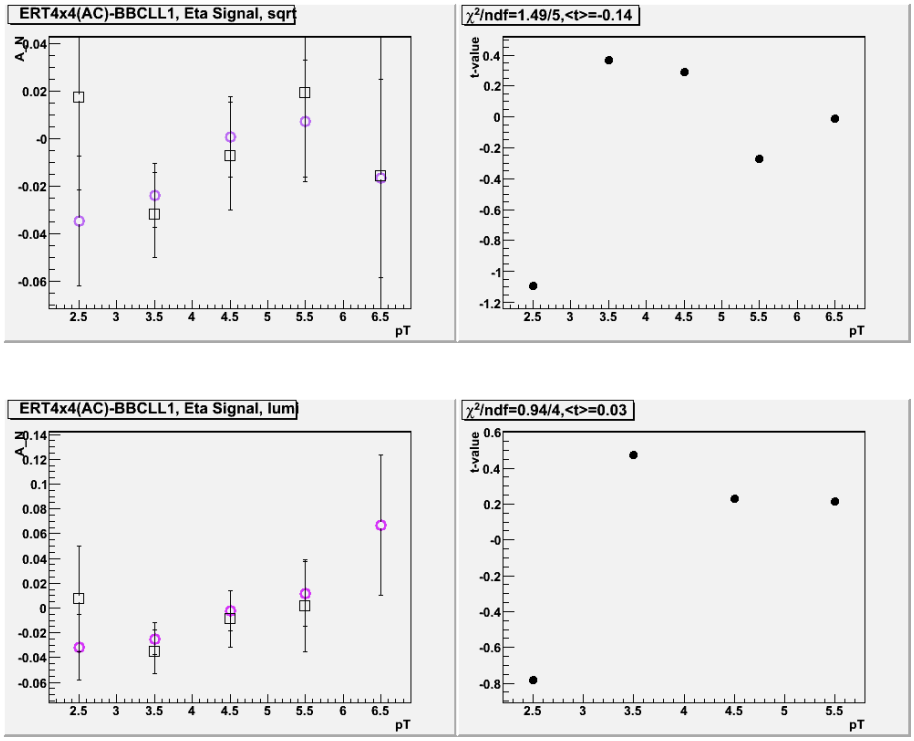

Figure 60: x_F >0.01 selection, Blue yellow comparison of even/odd combined asymmetries for η mass window. Top to bottom: sqrt, lumi

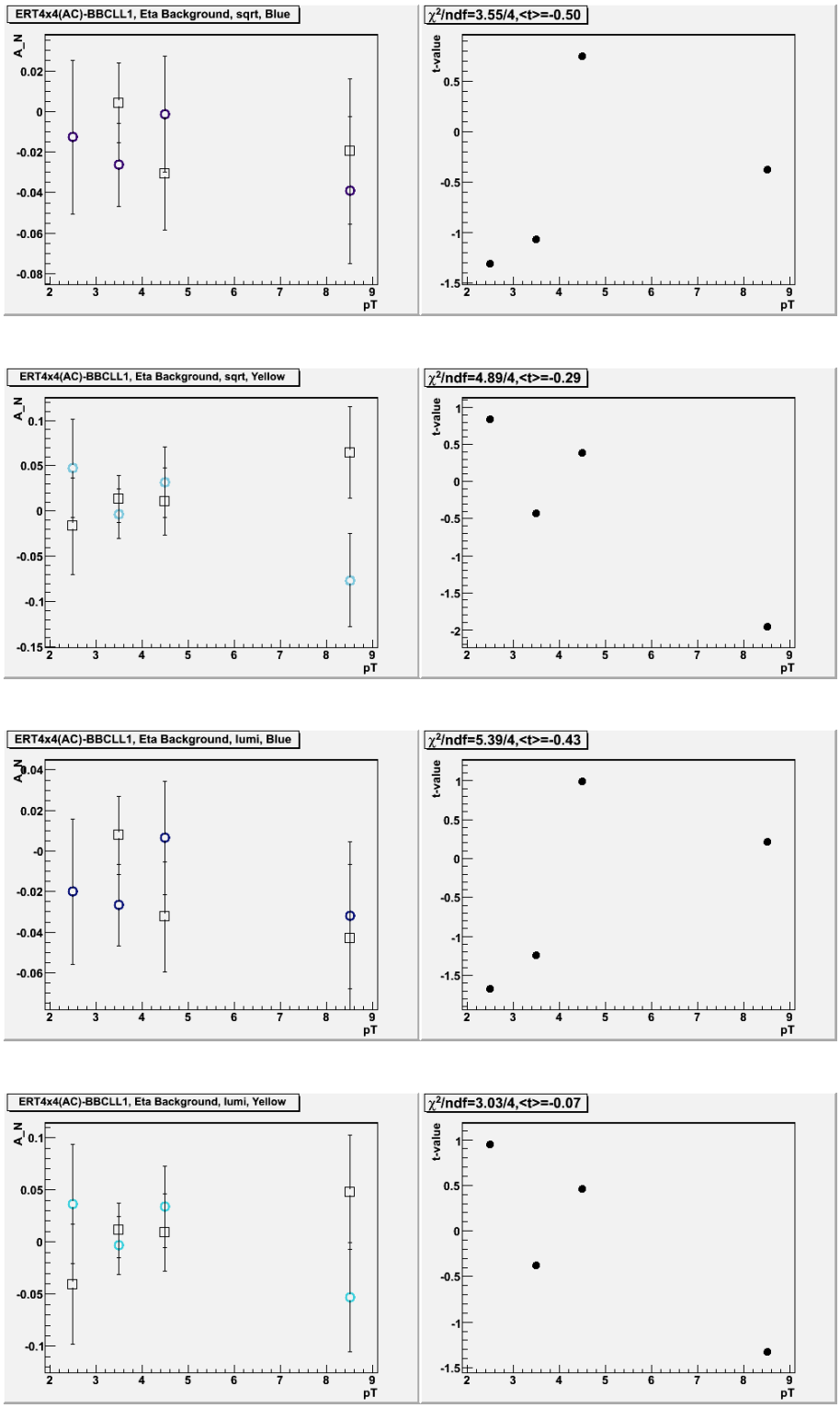

Figure 61: x_F >0.01 selection, Even odd comparison of asymmetries for η background mass window. Top to bottom: sqrt formula+blue beam, sqrt formula+yellow beam, lumi formula+blue beam, lumi formula+yellow beam

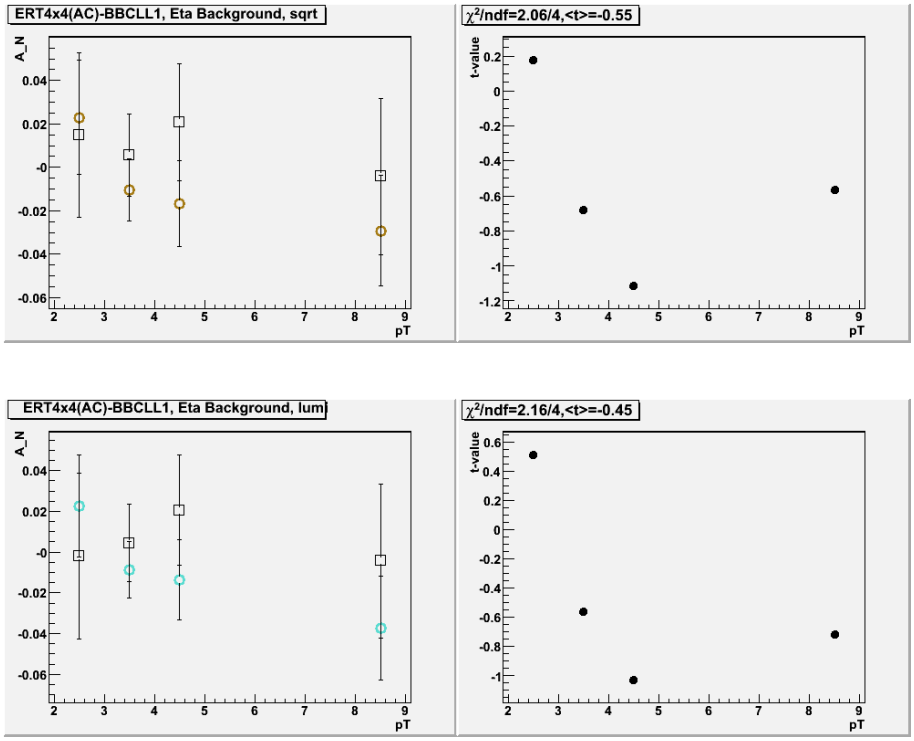

Figure 62: x_F >0.01 selection, Blue yellow comparison of even/odd combined asymmetries for η background mass window. Top to bottom: sqrt, lumi

C.4 Backward η

C.4.1 $A_N^{\pi^0 signal+background}$

C.4.2 $A_N^{\pi^0 background}$

C.4.3 $A_N^{\eta signal+background}$

C.4.4 $A_N^{\eta background}$

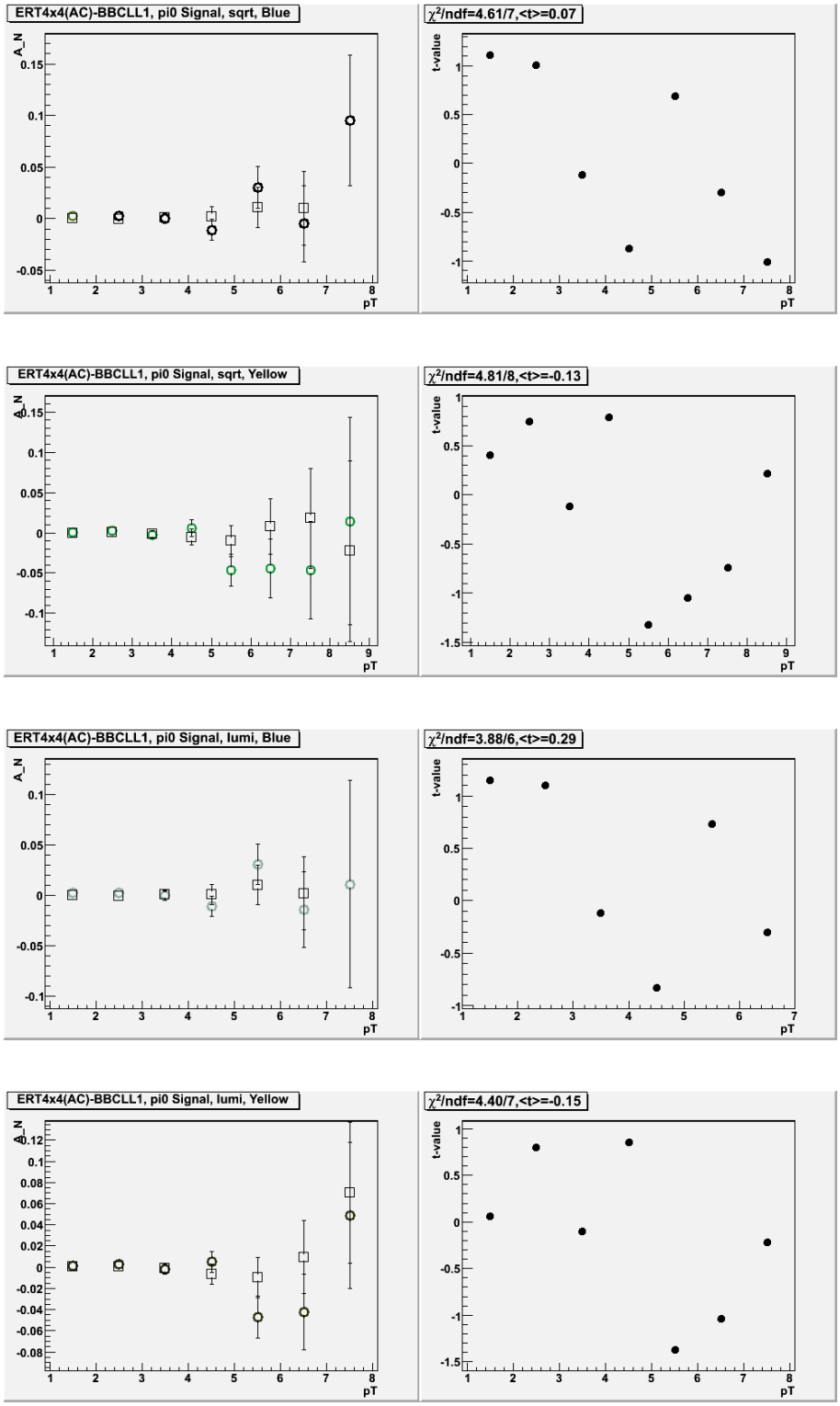

Figure 63: $\eta < -0.2$, Even odd comparison of asymmetries for π^0 mass window. Top to bottom: sqrt formula+blue beam, sqrt formula+yellow beam, lumi formula+blue beam, lumi formula+yellow beam

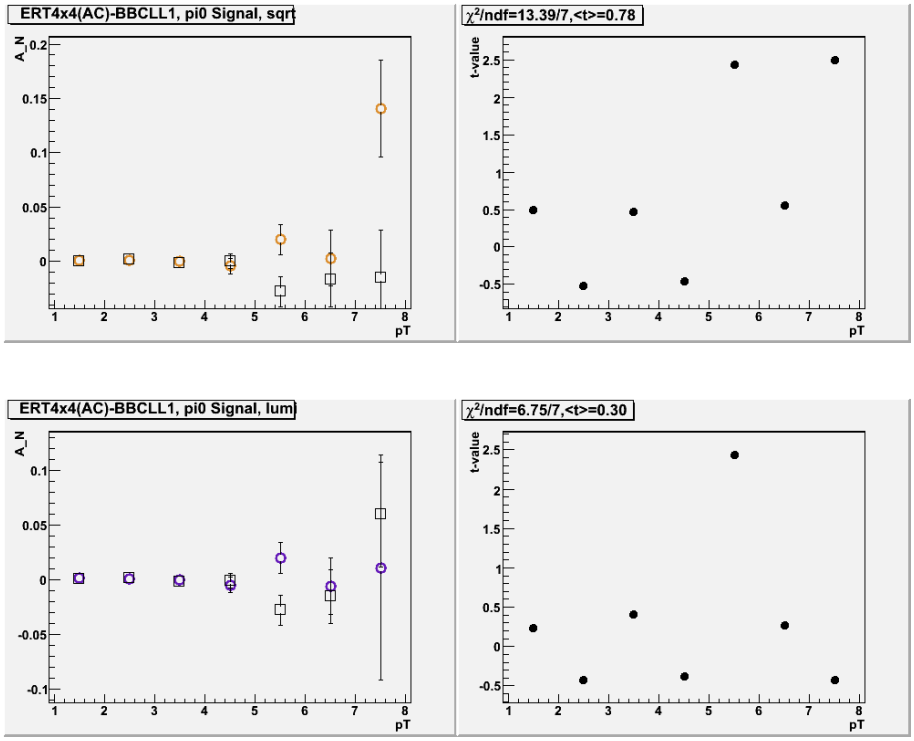

Figure 64: $\eta < -0.2$ selection, Blue yellow comparison of even/odd combined asymmetries for π^0 mass window. Top to bottom: sqrt, lumi

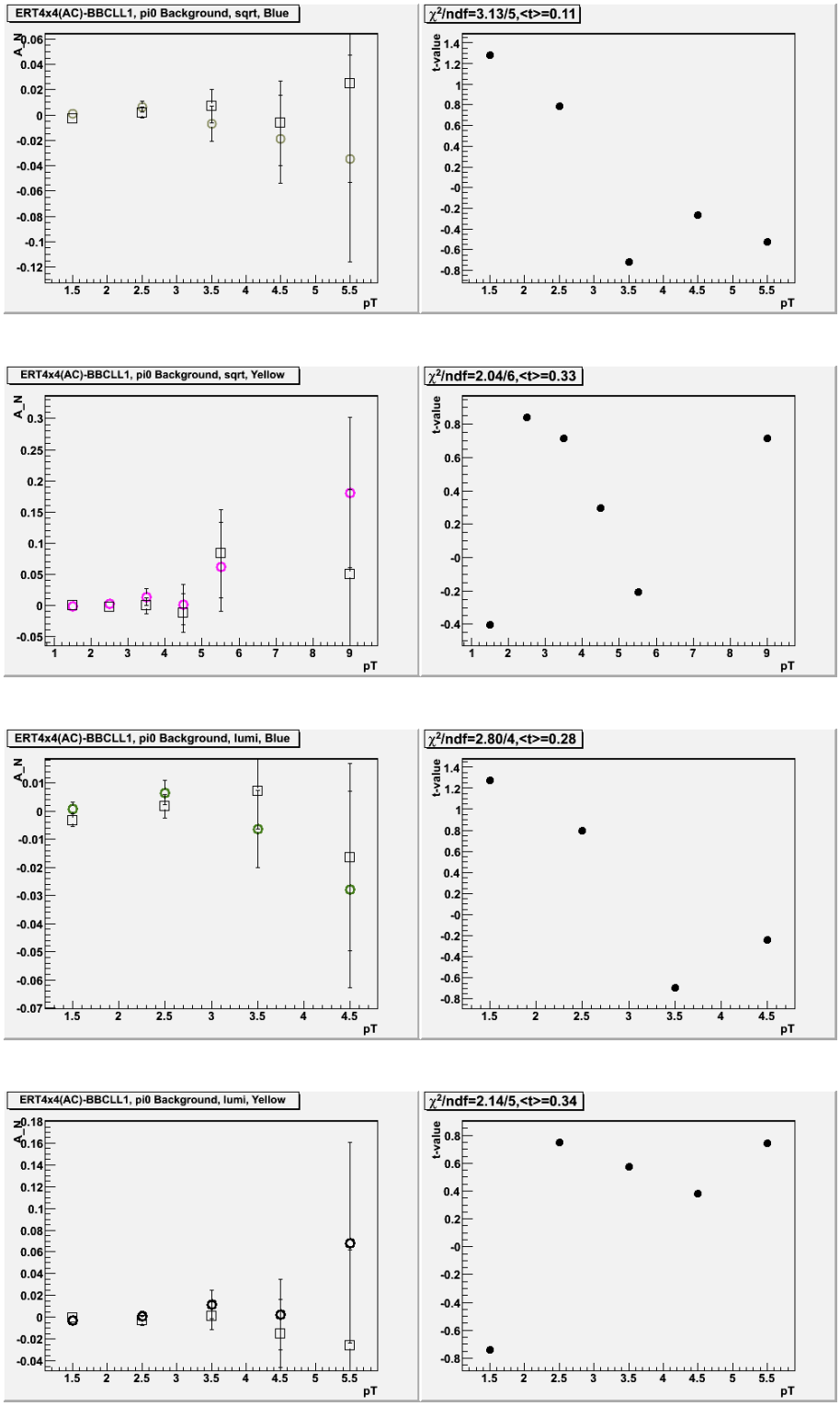

Figure 65: $\eta < -0.2$ selection, Even odd comparison of asymmetries for π^0 background mass window. Top to bottom: sqrt formula+blue beam, sqrt formula+yellow beam, lumi formula+blue beam, lumi formula+yellow beam

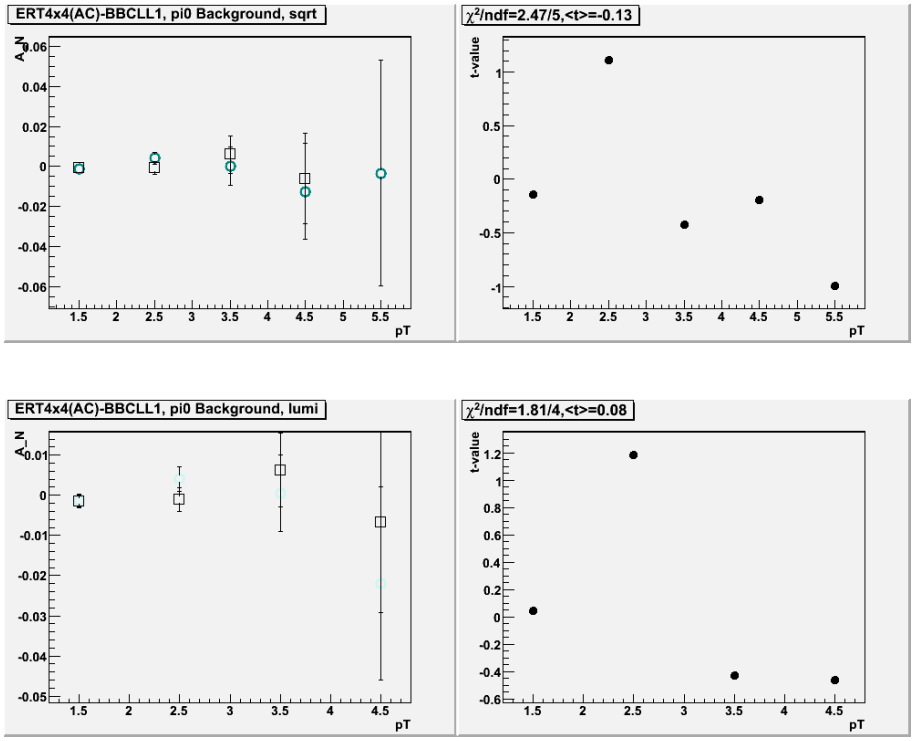

Figure 66: $\eta < -0.2$ selection, Blue yellow comparison of even/odd combined asymmetries for π^0 background mass window. Top to bottom: sqrt, lumi

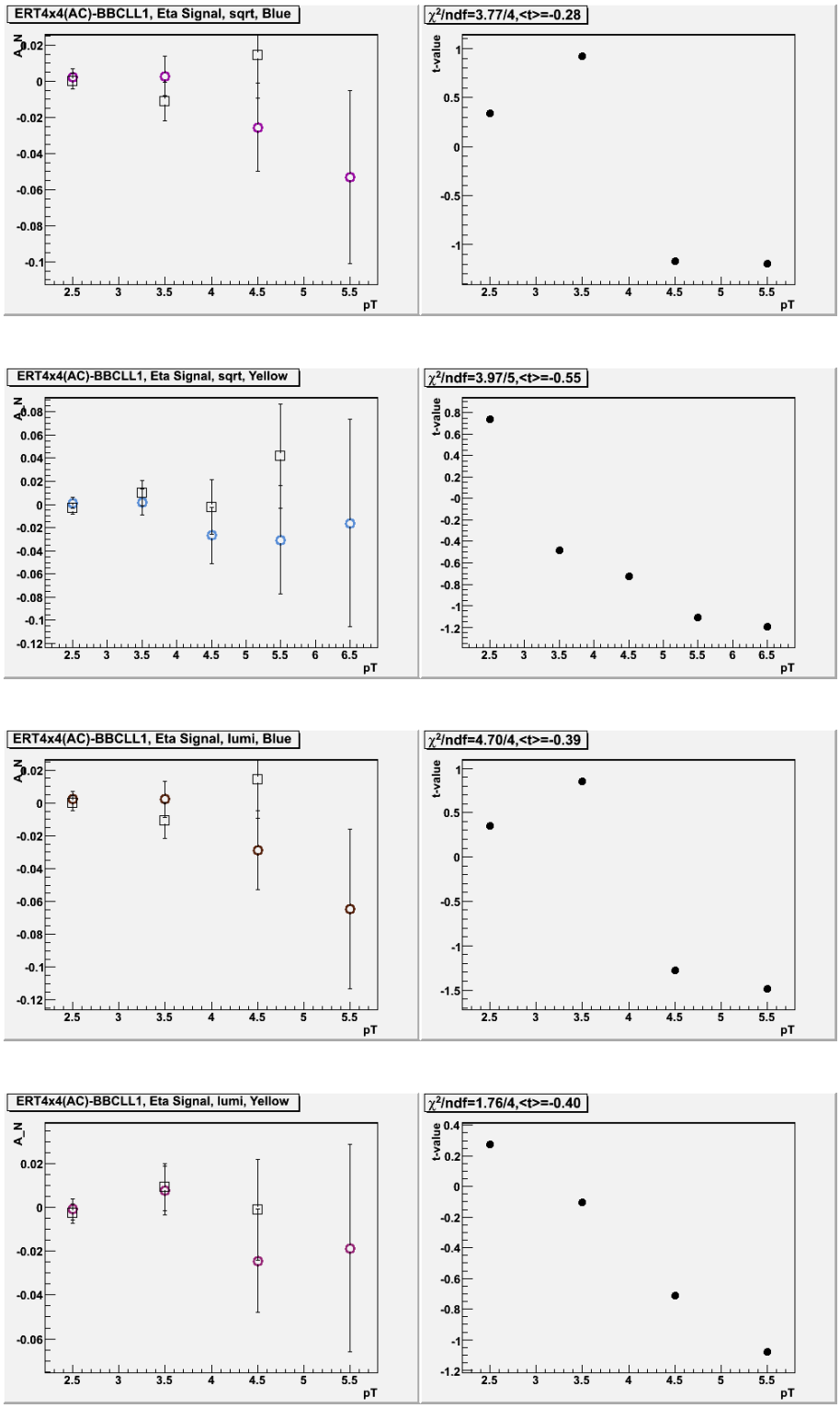

Figure 67: $\eta < -0.2$ selection, Even odd comparison of asymmetries for η mass window. Top to bottom: sqrt formula+blue beam, sqrt formula+yellow beam, lumi formula+blue beam, lumi formula+yellow beam

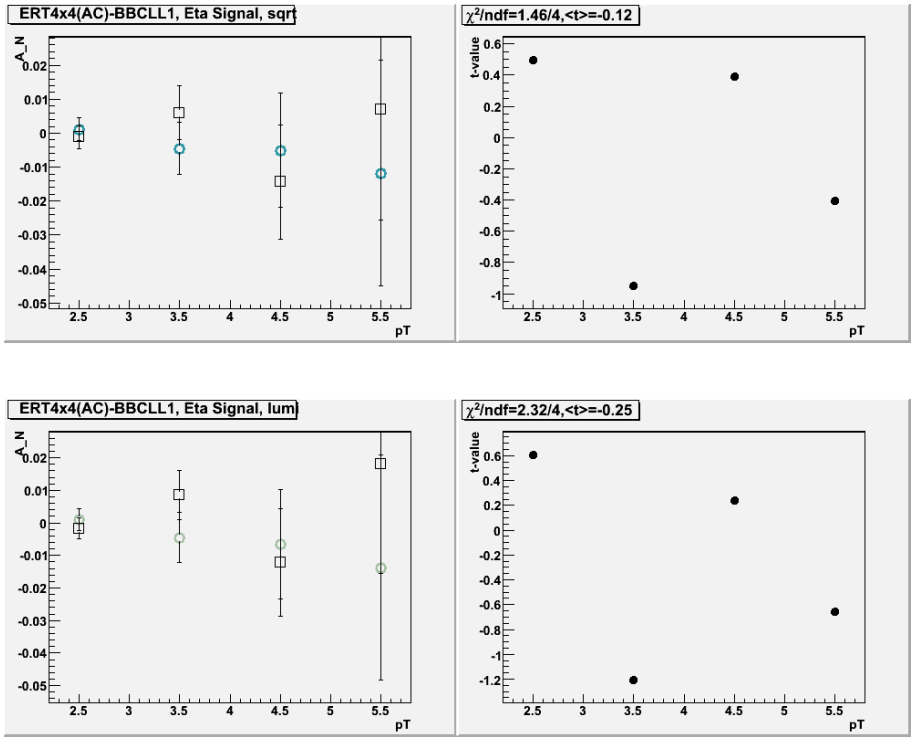

Figure 68: $\eta < -0.2$ selection, Blue yellow comparison of even/odd combined asymmetries for η mass window. Top to bottom: sqrt, lumi

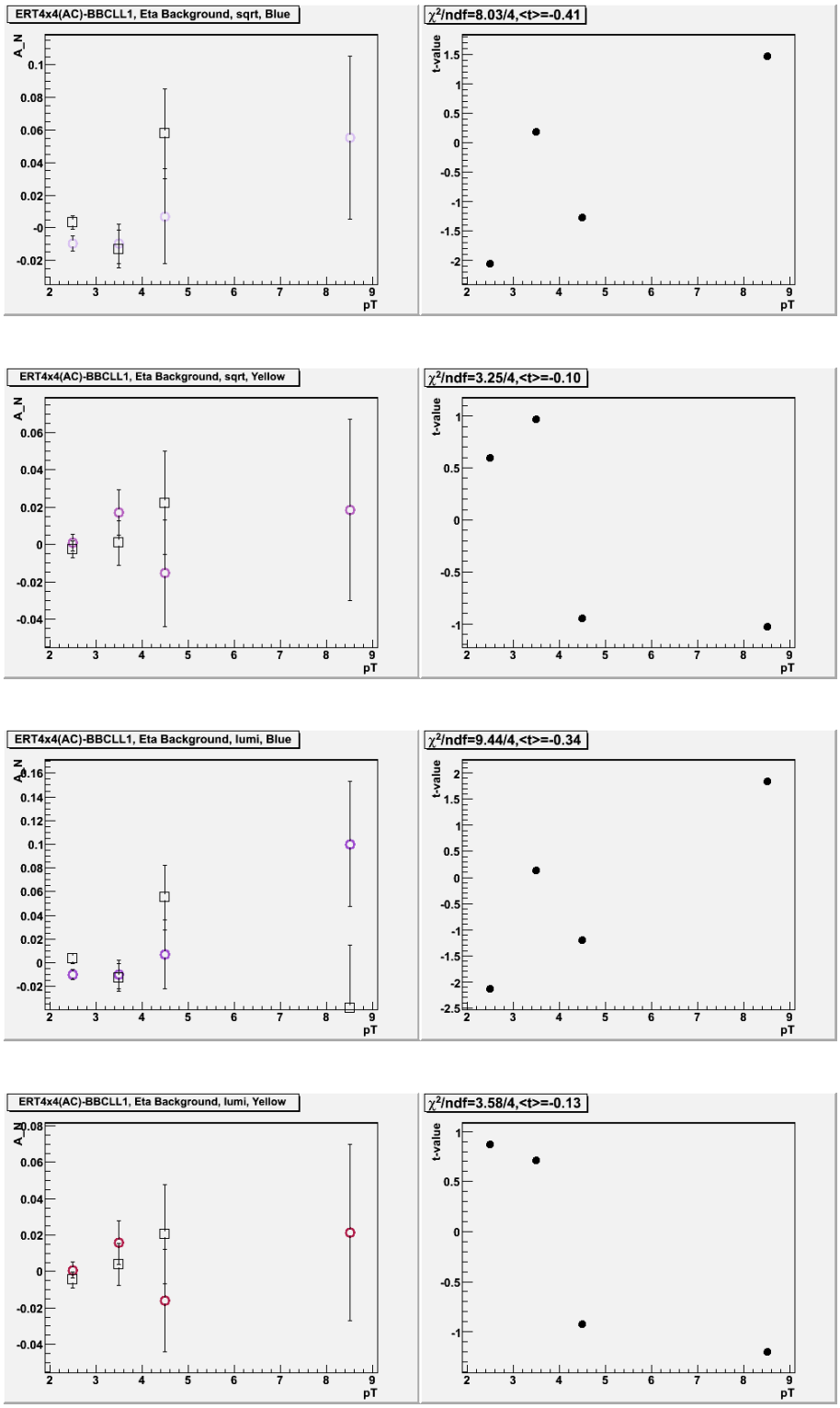

Figure 69: $\eta < -0.2$ selection, Even odd comparison of asymmetries for η background mass window. Top to bottom: sqrt formula+blue beam, sqrt formula+yellow beam, lumi formula+blue beam, lumi formula+yellow beam

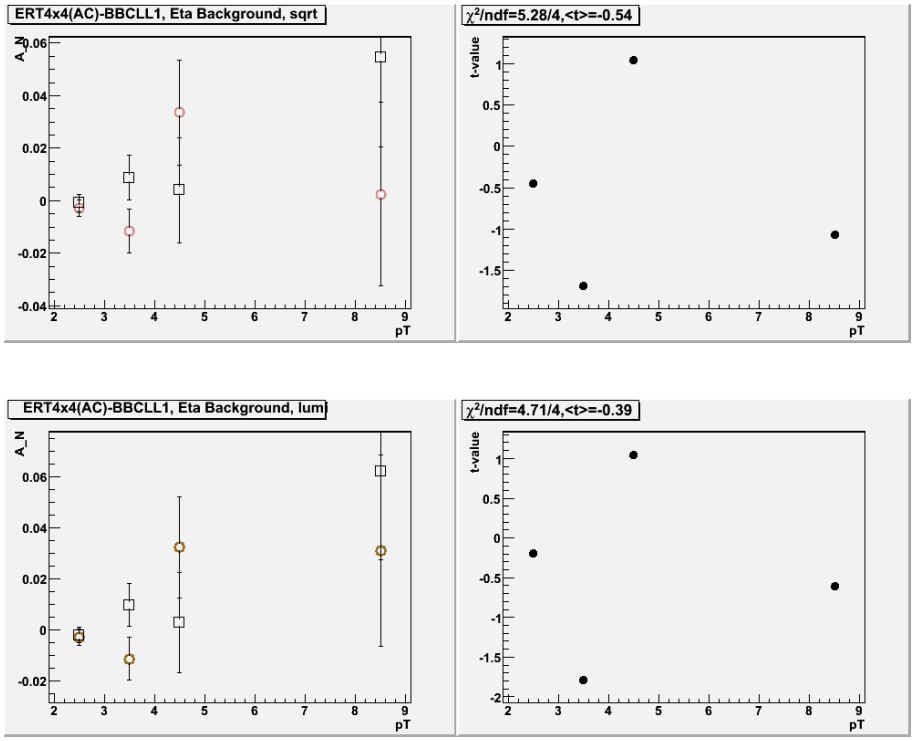

Figure 70: $\eta < -0.2$ selection, Blue yellow comparison of even/odd combined asymmetries for η background mass window. Top to bottom: sqrt, lumi

C.5 Forward η

C.5.1 $A_N^{\pi^0 signal+background}$

C.5.2 $A_N^{\pi^0 background}$

C.5.3 $A_N^{\eta signal+background}$

C.5.4 $A_N^{\eta background}$

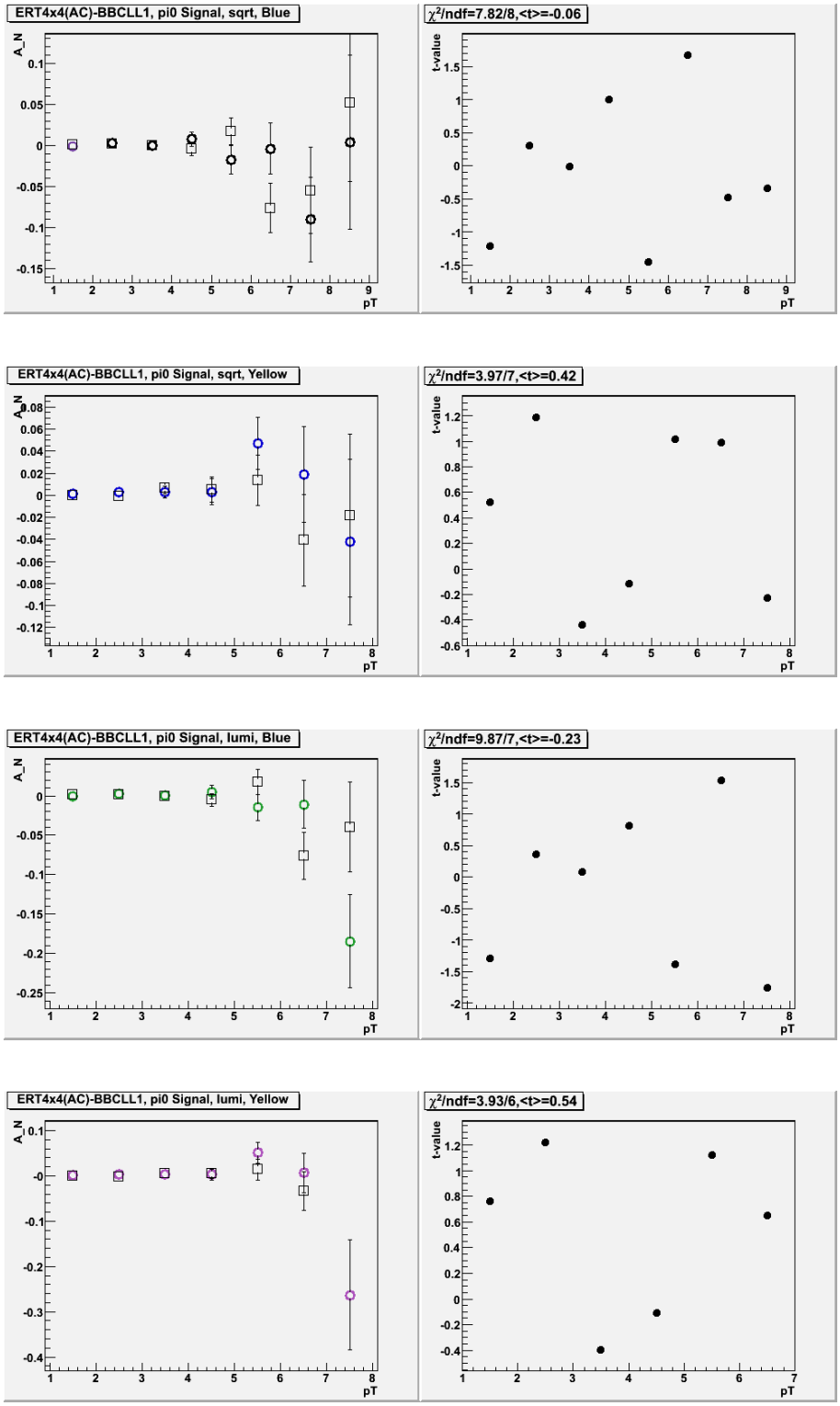

Figure 71: $\eta < -0.2$, Even odd comparison of asymmetries for π^0 mass window. Top to bottom: sqrt formula+blue beam, sqrt formula+yellow beam, lumi formula+blue beam, lumi formula+yellow beam

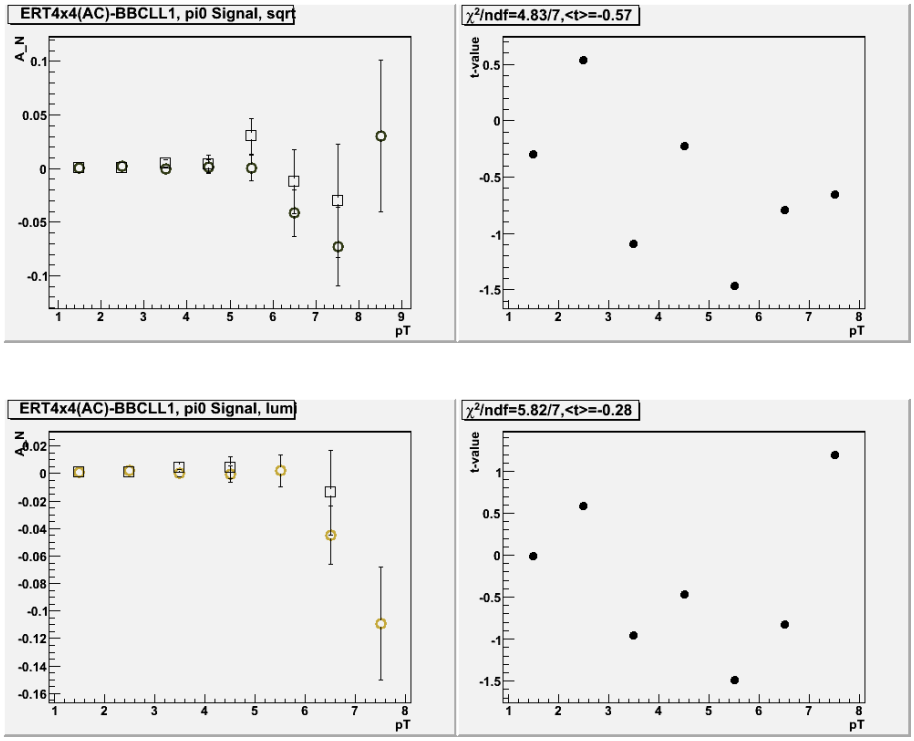

Figure 72: $\eta < -0.2$ selection, Blue yellow comparison of even/odd combined asymmetries for π^0 mass window. Top to bottom: sqrt, lumi

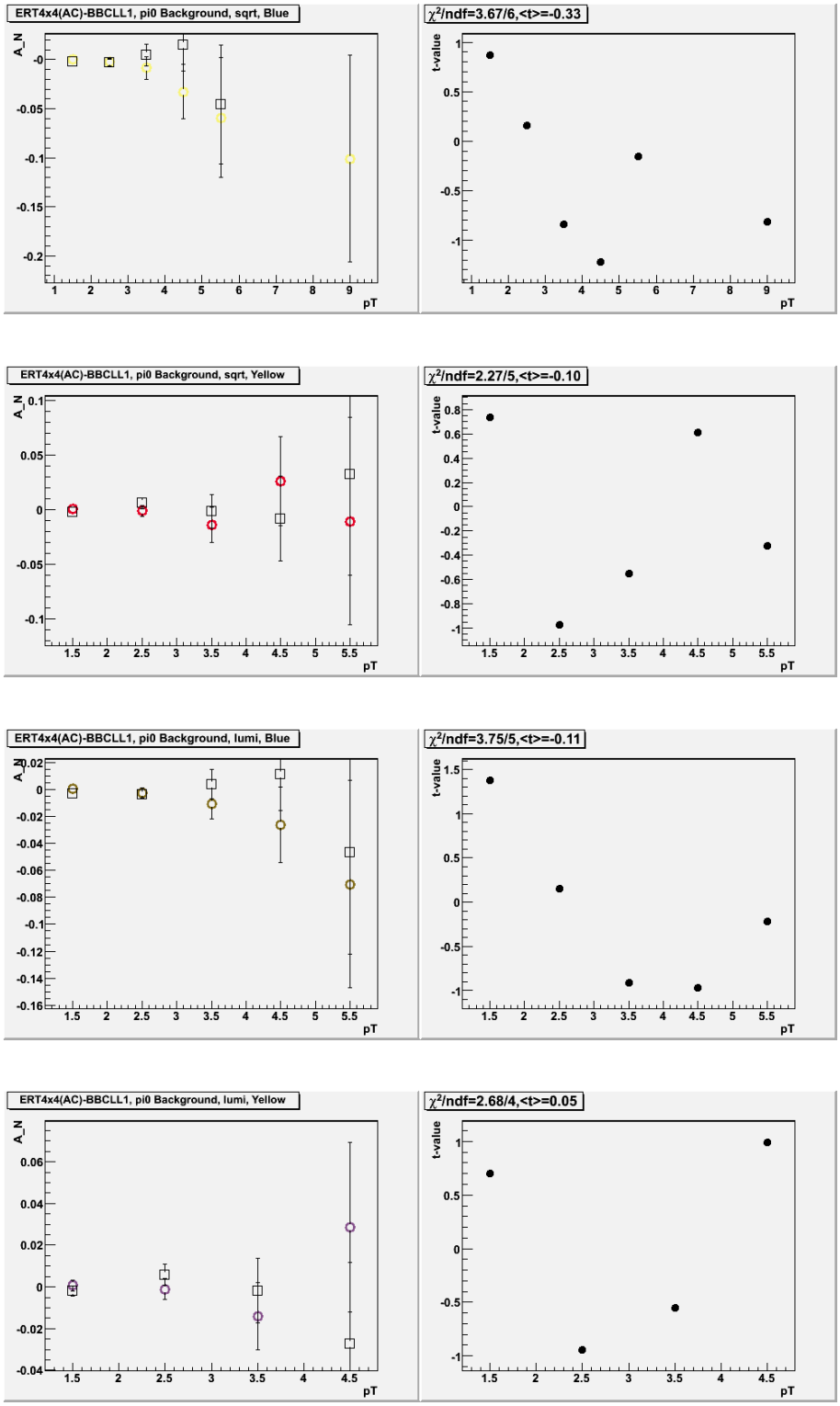

Figure 73: $\eta < -0.2$ selection, Even odd comparison of asymmetries for π^0 background mass window. Top to bottom: sqrt formula+blue beam, sqrt formula+yellow beam, lumi formula+blue beam, lumi formula+yellow beam

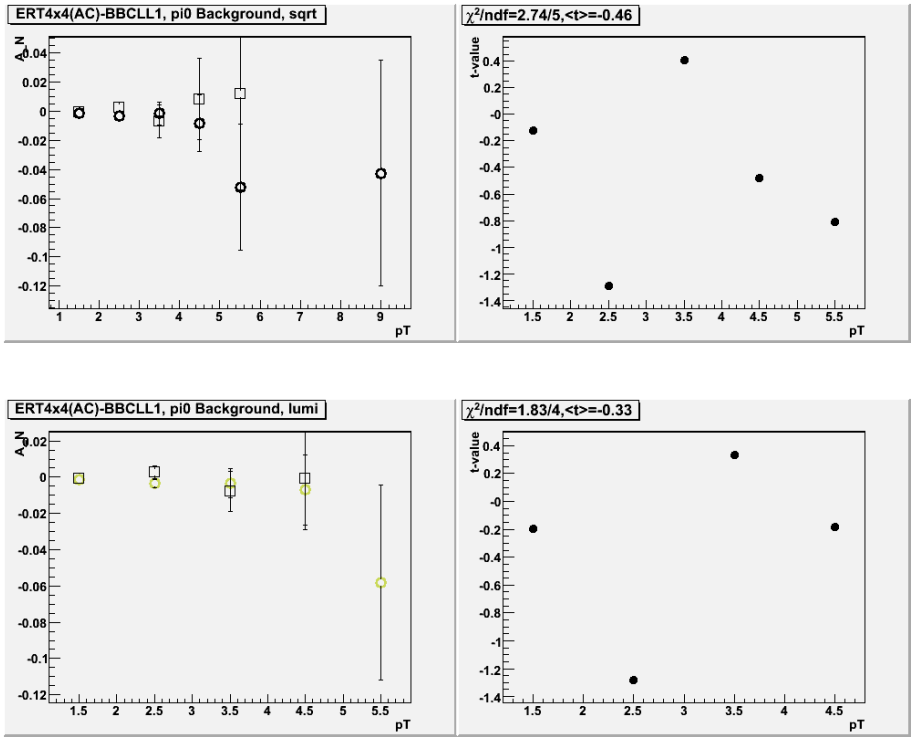

Figure 74: $\eta < -0.2$ selection, Blue yellow comparison of even/odd combined asymmetries for π^0 background mass window. Top to bottom: sqrt, lumi

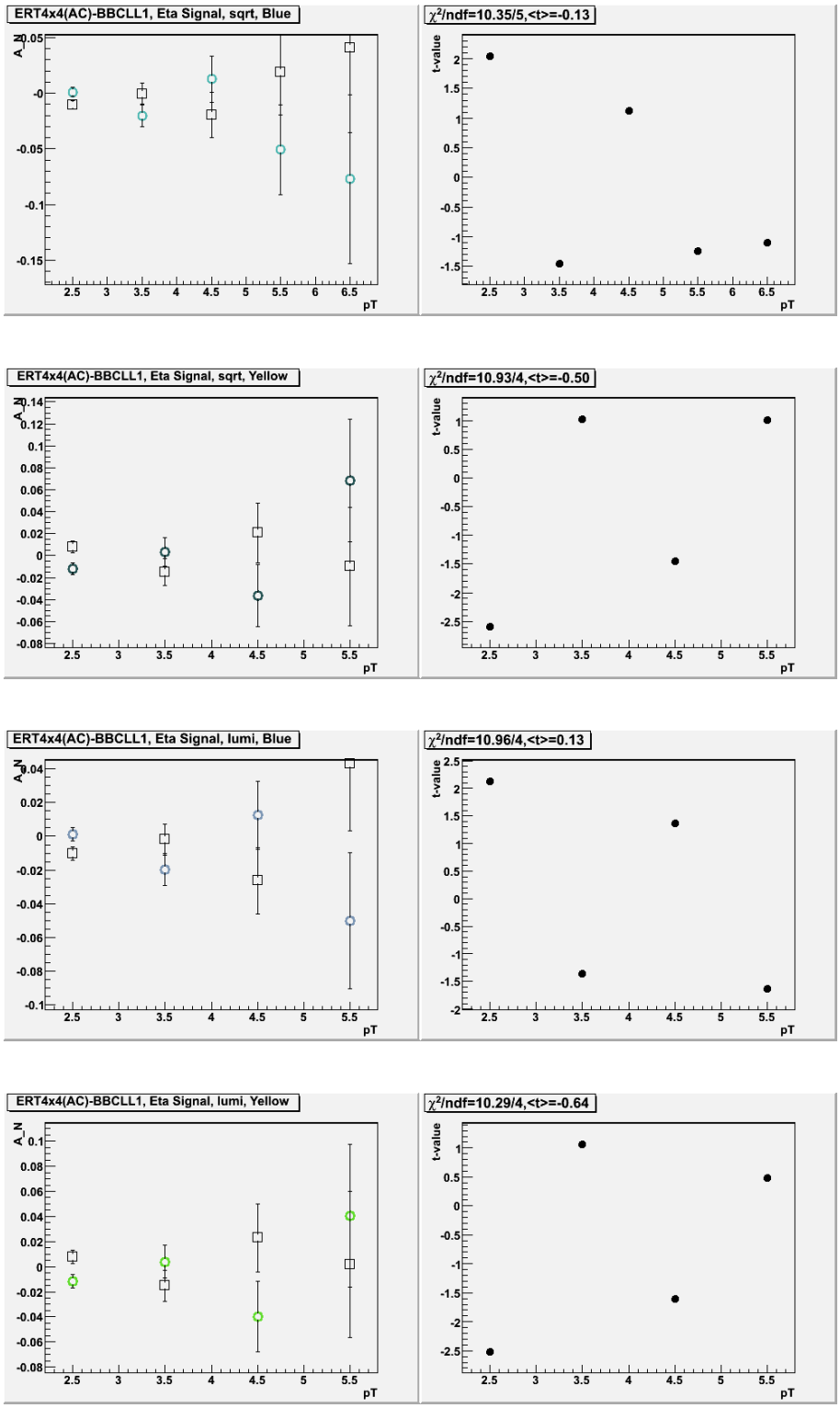

Figure 75: $\eta < -0.2$ selection, Even odd comparison of asymmetries for η mass window. Top to bottom: sqrt formula+blue beam, sqrt formula+yellow beam, lumi formula+blue beam, lumi formula+yellow beam

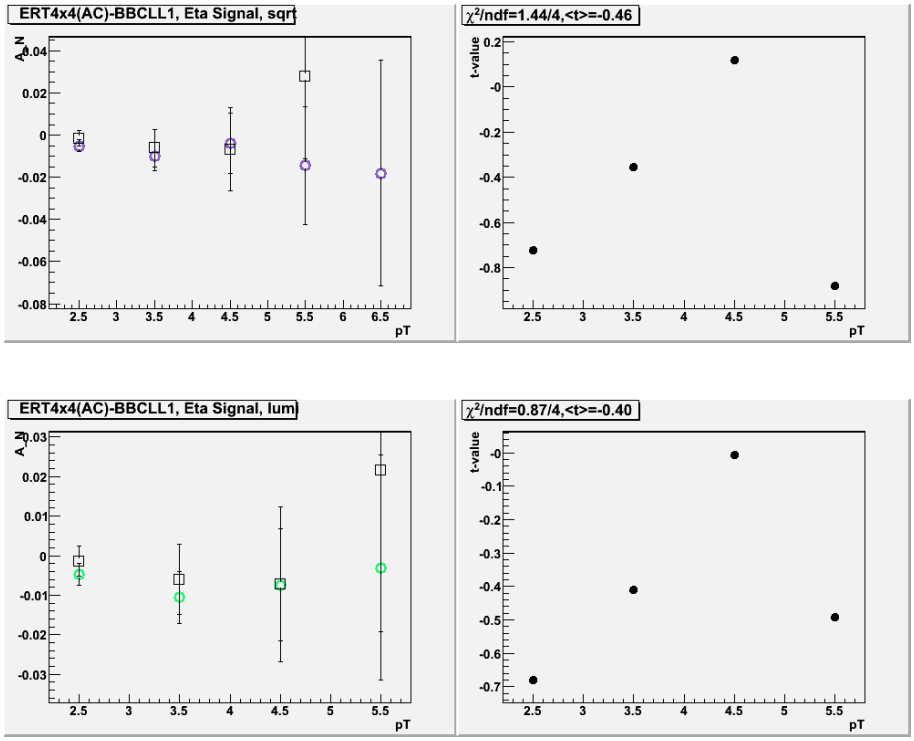

Figure 76: $\eta < -0.2$ selection, Blue yellow comparison of even/odd combined asymmetries for η mass window. Top to bottom: sqrt, lumi

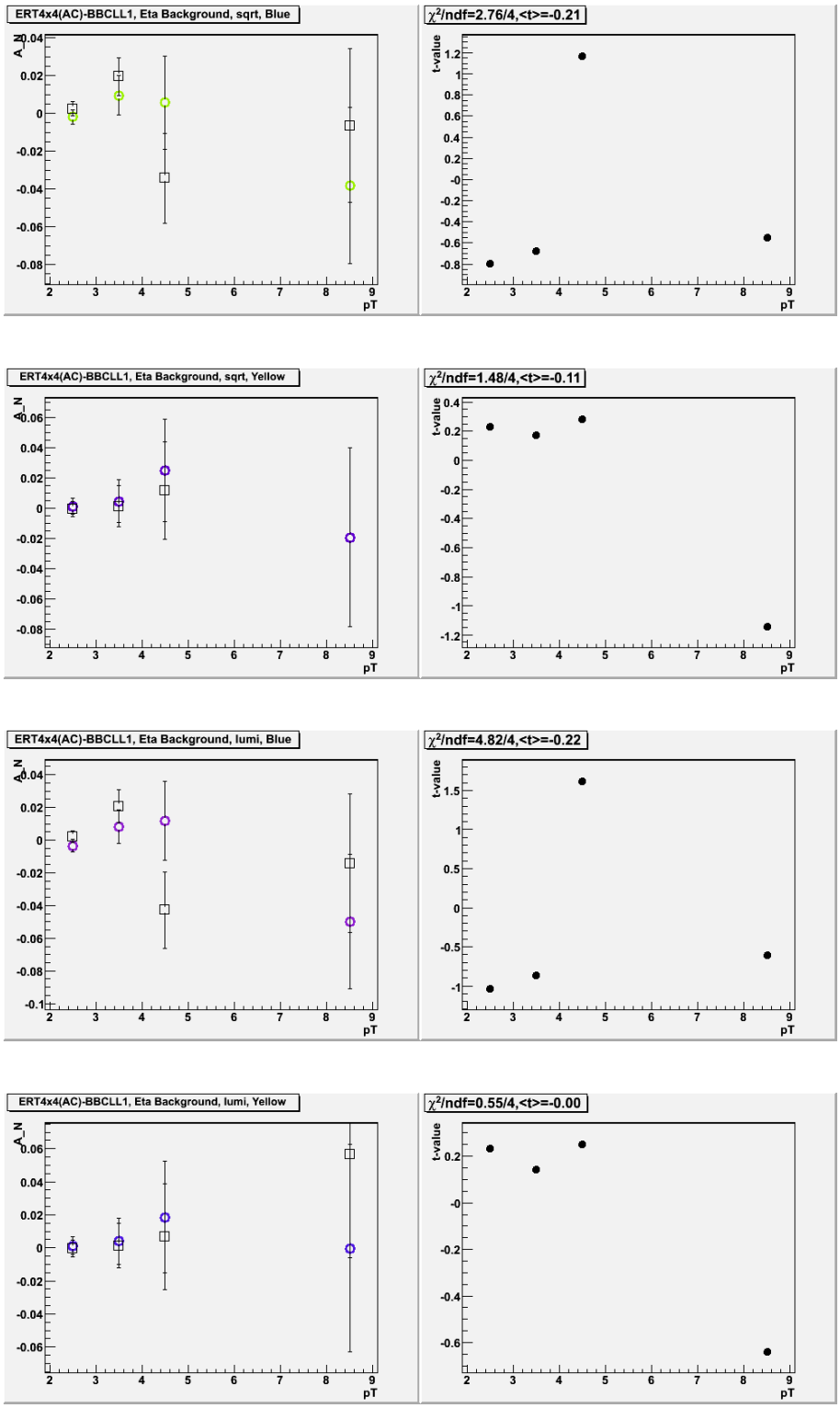

Figure 77: $\eta < -0.2$ selection, Even odd comparison of asymmetries for η background mass window. Top to bottom: sqrt formula+blue beam, sqrt formula+yellow beam, lumi formula+blue beam, lumi formula+yellow beam

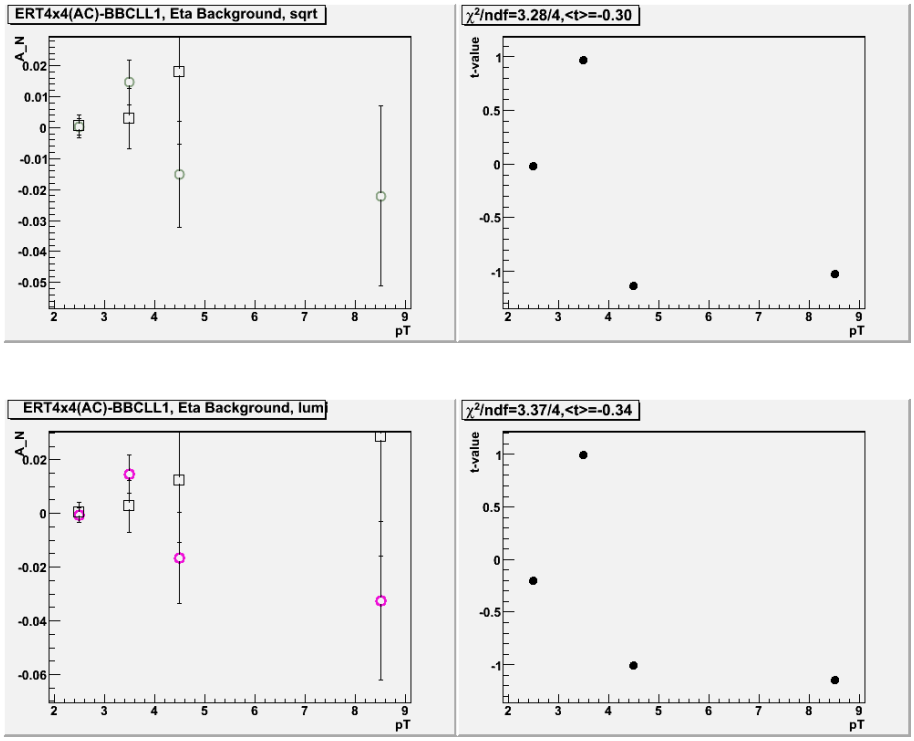

Figure 78: $\eta < -0.2$ selection, Blue yellow comparison of even/odd combined asymmetries for η background mass window. Top to bottom: sqrt, lumi

D Statistical subtraction

I define a variable $\tau = \frac{(1-r)\delta A^S}{\delta A^{SB}}$ to verify that the error bars of the statistically subtracted asymmetry, A^S, are dominated by the statistical error of the Signal+Background rather than the Background. When the background asymmetry does nothing to increase the size of the error bar, τ=1.

D.1 Inclusive

ERT4x4(AC)-BBCLL1, pi0 Signal, sqrt Formula, Inclusive x_F, Inclusive pseudorapidity					
p_T Bin	A_N^{peak}	$A_N^{background}$	r	A_N^{signal}	τ
1.0-2.0	4.40e-04±3.83e-04	-2.82e-04±5.18e-04	3.32e-01	8.00e-04±6.29e-04	1.10e+00
2.0-3.0	6.94e-04±4.57e-04	1.12e-03±9.37e-04	1.51e-01	6.19e-04±5.63e-04	1.05e+00
3.0-4.0	1.39e-04±9.51e-04	-8.82e-04±2.84e-03	7.34e-02	2.20e-04±1.05e-03	1.02e+00
4.0-5.0	7.59e-04±2.07e-03	-9.16e-03±7.14e-03	5.58e-02	1.35e-03±2.23e-03	1.02e+00
5.0-6.0	7.80e-04±4.15e-03	1.49e-02±1.50e-02	5.13e-02	1.68e-05±4.45e-03	1.02e+00
6.0-7.0	-8.47e-03±7.53e-03	-1.37e-03±2.28e-02	5.55e-02	-8.89e-03±8.09e-03	1.01e+00
7.0-8.0	-8.86e-04±1.26e-02	-1.37e-03±2.28e-02	5.78e-02	-8.57e-04±1.34e-02	1.01e+00
8.0-9.0	5.79e-03±1.95e-02	-1.37e-03±2.28e-02	5.82e-02	6.23e-03±2.07e-02	1.00e+00
9.0-10.0	-9.68e-03±2.95e-02	-1.37e-03±2.28e-02	5.38e-02	-1.02e-02±3.12e-02	1.00e+00
10.0-12.0	3.73e-02±3.53e-02	-1.37e-03±2.28e-02	5.13e-02	3.94e-02±3.73e-02	1.00e+00

ERT4x4(AC)-BBCLL1, pi0 Signal, lumi Formula, Inclusive x_F, Inclusive pseudorapidity					
p_T Bin	A_N^{peak}	$A_N^{background}$	r	A_N^{signal}	τ
1.0-2.0	4.41e-04±3.83e-04	-3.47e-04±5.17e-04	3.32e-01	8.33e-04±6.28e-04	1.10e+00
2.0-3.0	7.02e-04±4.56e-04	1.15e-03±9.36e-04	1.51e-01	6.24e-04±5.62e-04	1.05e+00
3.0-4.0	2.18e-04±9.49e-04	-9.30e-04±2.84e-03	7.34e-02	3.08e-04±1.05e-03	1.02e+00
4.0-5.0	6.67e-04±2.07e-03	-9.21e-03±7.13e-03	5.58e-02	1.25e-03±2.23e-03	1.02e+00
5.0-6.0	8.29e-04±4.14e-03	1.92e-02±1.50e-02	5.13e-02	-1.66e-04±4.44e-03	1.02e+00
6.0-7.0	-8.42e-03±7.51e-03	9.18e-04±2.31e-02	5.55e-02	-8.96e-03±8.07e-03	1.01e+00
7.0-8.0	-2.86e-03±1.26e-02	9.18e-04±2.31e-02	5.78e-02	-3.09e-03±1.34e-02	1.01e+00
8.0-9.0	8.62e-03±1.98e-02	9.18e-04±2.31e-02	5.82e-02	9.09e-03±2.11e-02	1.00e+00
9.0-10.0	-2.58e-02±3.50e-02	9.18e-04±2.31e-02	5.38e-02	-2.74e-02±3.70e-02	1.00e+00
10.0-12.0	2.02e-02±8.08e-02	9.18e-04±2.31e-02	5.13e-02	2.12e-02±8.51e-02	1.00e+00

ERT4x4(AC)-BBCLL1, Eta Signal, sqrt Formula, Inclusive x_F, Inclusive pseudorapidity					
p_T Bin	A_N^{peak}	$A_N^{background}$	r	A_N^{signal}	τ
2.0-3.0	-1.10e-03±8.98e-04	6.34e-04±8.75e-04	7.70e-01	-6.92e-03±4.88e-03	1.25e+00
3.0-4.0	-8.29e-04±2.01e-03	6.85e-04±2.27e-03	5.80e-01	-2.92e-03±5.71e-03	1.20e+00
4.0-5.0	-4.69e-03±4.38e-03	-5.09e-03±5.40e-03	4.82e-01	-4.32e-03±9.82e-03	1.16e+00
5.0-6.0	7.35e-03±8.62e-03	-2.09e-02±9.42e-03	4.35e-01	2.91e-02±1.69e-02	1.11e+00
6.0-7.0	-3.62e-02±1.56e-02	-2.09e-02±9.42e-03	4.28e-01	-4.77e-02±2.81e-02	1.03e+00
7.0-8.0	-2.69e-03±2.63e-02	-2.09e-02±9.42e-03	3.74e-01	8.16e-03±4.24e-02	1.01e+00
8.0-12.0	3.76e-02±3.25e-02	-2.09e-02±9.42e-03	3.99e-01	7.64e-02±5.45e-02	1.01e+00

ERT4x4(AC)-BBCLL1, Eta Signal, lumi Formula, Inclusive x_F, Inclusive pseudorapidity					
p_T Bin	A_N^{peak}	$A_N^{background}$	r	A_N^{signal}	τ
2.0-3.0	-1.07e-03±8.90e-04	3.99e-04±8.69e-04	7.70e-01	-6.01e-03±4.84e-03	1.25e+00
3.0-4.0	-1.22e-03±2.00e-03	9.57e-04±2.26e-03	5.80e-01	-4.23e-03±5.69e-03	1.20e+00
4.0-5.0	-4.78e-03±4.36e-03	-5.29e-03±5.38e-03	4.82e-01	-4.31e-03±9.79e-03	1.16e+00
5.0-6.0	6.05e-03±8.61e-03	-2.12e-02±9.40e-03	4.35e-01	2.71e-02±1.69e-02	1.11e+00
6.0-7.0	-3.24e-02±1.56e-02	-2.12e-02±9.40e-03	4.28e-01	-4.07e-02±2.81e-02	1.03e+00
7.0-8.0	-2.37e-04±2.85e-02	-2.12e-02±9.40e-03	3.74e-01	1.23e-02±4.58e-02	1.01e+00
8.0-12.0	-2.74e-02±4.48e-02	-2.12e-02±9.40e-03	3.99e-01	-3.16e-02±7.48e-02	1.00e+00

D.2 Backward x_F

ERT4x4(AC)-BBCLL1, pi0 Signal, sqrt Formula, $x_F < -0.01$, Inclusive pseudorapidity					
p_T Bin	A_N^{peak}	$A_N^{background}$	r	A_N^{signal}	τ
2.0-3.0	9.26e-03±7.73e-03	1.28e-02±1.77e-02	1.51e-01	8.62e-03±9.62e-03	1.06e+00
3.0-4.0	-1.01e-03±3.94e-03	9.02e-03±1.14e-02	7.34e-02	-1.80e-03±4.34e-03	1.02e+00
4.0-5.0	-4.95e-03±5.56e-03	-8.76e-03±1.85e-02	5.58e-02	-4.72e-03±5.99e-03	1.02e+00
5.0-6.0	-8.22e-03±9.32e-03	3.81e-02±3.47e-02	5.13e-02	-1.07e-02±1.00e-02	1.02e+00
6.0-7.0	-1.87e-02±1.53e-02	5.16e-02±6.01e-02	5.55e-02	-2.29e-02±1.66e-02	1.02e+00
7.0-8.0	4.08e-02±2.44e-02	5.16e-02±6.01e-02	5.78e-02	4.01e-02±2.61e-02	1.01e+00
8.0-9.0	-3.42e-02±3.94e-02	5.16e-02±6.01e-02	5.82e-02	-3.95e-02±4.20e-02	1.00e+00

ERT4x4(AC)-BBCLL1, pi0 Signal, lumi Formula, $x_F < -0.01$, Inclusive pseudorapidity					
p_T Bin	A_N^{peak}	$A_N^{background}$	r	A_N^{signal}	τ
2.0-3.0	6.85e-03±7.48e-03	1.50e-02±1.75e-02	1.51e-01	5.39e-03±9.33e-03	1.06e+00
3.0-4.0	-4.44e-04±3.86e-03	6.15e-03±1.13e-02	7.34e-02	-9.66e-04±4.26e-03	1.02e+00
4.0-5.0	-5.09e-03±5.50e-03	-8.21e-03±1.86e-02	5.58e-02	-4.91e-03±5.93e-03	1.02e+00
5.0-6.0	-8.01e-03±9.26e-03	4.20e-02±5.19e-02	5.13e-02	-1.07e-02±1.02e-02	1.04e+00
6.0-7.0	-1.91e-02±1.53e-02	-4.22e-02±8.10e-02	5.55e-02	-1.77e-02±1.69e-02	1.04e+00
7.0-8.0	3.40e-02±2.55e-02	-4.22e-02±8.10e-02	5.78e-02	3.87e-02±2.75e-02	1.02e+00
8.0-9.0	5.30e-02±1.22e-01	-4.22e-02±8.10e-02	5.82e-02	5.89e-02±1.29e-01	1.00e+00

ERT4x4(AC)-BBCLL1, Eta Signal, sqrt Formula, $x_F < -0.01$, Inclusive pseudorapidity					
p_T Bin	A_N^{peak}	$A_N^{background}$	r	A_N^{signal}	τ
2.0-3.0	1.41e-03±2.31e-02	-4.23e-03±2.24e-02	7.70e-01	2.03e-02±1.25e-01	1.25e+00
3.0-4.0	5.19e-03±1.11e-02	-2.32e-03±1.17e-02	5.80e-01	1.56e-02±3.08e-02	1.17e+00
4.0-5.0	-1.15e-02±1.39e-02	3.01e-02±1.63e-02	4.82e-01	-5.01e-02±3.08e-02	1.15e+00
5.0-6.0	6.59e-03±2.14e-02	-1.18e-03±2.14e-02	4.35e-01	1.26e-02±4.12e-02	1.09e+00
6.0-7.0	4.03e-02±3.63e-02	-1.18e-03±2.14e-02	4.28e-01	7.12e-02±6.55e-02	1.03e+00

ERT4x4(AC)-BBCLL1, Eta Signal, lumi Formula, $x_F < -0.01$, Inclusive pseudorapidity					
p_T Bin	A_N^{peak}	$A_N^{background}$	r	A_N^{signal}	τ
2.0-3.0	2.69e-03±2.35e-02	7.19e-03±2.25e-02	7.70e-01	-1.24e-02±1.27e-01	1.24e+00
3.0-4.0	4.72e-03±1.08e-02	1.23e-03±1.15e-02	5.80e-01	9.55e-03±3.03e-02	1.17e+00
4.0-5.0	-1.11e-02±1.37e-02	2.46e-02±1.62e-02	4.82e-01	-4.42e-02±3.04e-02	1.15e+00
5.0-6.0	8.38e-03±2.20e-02	7.39e-03±2.19e-02	4.35e-01	9.14e-03±4.24e-02	1.09e+00
6.0-7.0	1.35e-02±6.65e-02	7.39e-03±2.19e-02	4.28e-01	1.81e-02±1.17e-01	1.01e+00

D.3 Forward x_F

ERT4x4(AC)-BBCLL1, pi0 Signal, sqrt Formula, $x_F > 0.01$, Inclusive pseudorapidity					
p_T Bin	A_N^{peak}	$A_N^{background}$	r	A_N^{signal}	τ
2.0-3.0	7.45e-03±7.56e-03	-2.81e-03±1.72e-02	1.51e-01	9.27e-03±9.41e-03	1.06e+00
3.0-4.0	1.70e-03±3.87e-03	-6.12e-03±1.12e-02	7.34e-02	2.32e-03±4.27e-03	1.02e+00
4.0-5.0	6.42e-03±5.44e-03	1.00e-02±1.80e-02	5.58e-02	6.21e-03±5.86e-03	1.02e+00
5.0-6.0	4.83e-03±9.08e-03	-1.05e-02±3.33e-02	5.13e-02	5.66e-03±9.74e-03	1.02e+00
6.0-7.0	-2.02e-02±1.49e-02	-1.74e-02±5.12e-02	5.55e-02	-2.04e-02±1.61e-02	1.02e+00
7.0-8.0	-4.90e-02±2.38e-02	-1.74e-02±5.12e-02	5.78e-02	-5.10e-02±2.55e-02	1.01e+00
8.0-9.0	-1.90e-02±3.79e-02	-1.74e-02±5.12e-02	5.82e-02	-1.91e-02±4.04e-02	1.00e+00

ERT4x4(AC)-BBCLL1, pi0 Signal, lumi Formula, $x_F > 0.01$, Inclusive pseudorapidity					
p_T Bin	A_N^{peak}	$A_N^{background}$	r	A_N^{signal}	τ
2.0-3.0	7.24e-03±7.27e-03	-8.18e-04±1.69e-02	1.51e-01	8.67e-03±9.07e-03	1.06e+00
3.0-4.0	1.88e-03±3.77e-03	-8.10e-03±1.10e-02	7.34e-02	2.67e-03±4.17e-03	1.02e+00
4.0-5.0	4.58e-03±5.37e-03	9.85e-03±1.80e-02	5.58e-02	4.27e-03±5.79e-03	1.02e+00
5.0-6.0	6.19e-03±9.01e-03	-3.66e-02±4.40e-02	5.13e-02	8.50e-03±9.79e-03	1.03e+00
6.0-7.0	-2.20e-02±1.49e-02	5.02e-02±7.00e-02	5.55e-02	-2.62e-02±1.63e-02	1.03e+00
7.0-8.0	-6.94e-02±2.47e-02	5.02e-02±7.00e-02	5.78e-02	-7.68e-02±2.66e-02	1.01e+00
8.0-9.0	-1.39e-02±1.03e-01	5.02e-02±7.00e-02	5.82e-02	-1.78e-02±1.10e-01	1.00e+00

ERT4x4(AC)-BBCLL1, Eta Signal, sqrt Formula, $x_F > 0.01$, Inclusive pseudorapidity					
p_T Bin	A_N^{peak}	$A_N^{background}$	r	A_N^{signal}	τ
2.0-3.0	-1.75e-02±2.24e-02	2.04e-02±2.17e-02	7.70e-01	-1.44e-01±1.21e-01	1.25e+00
3.0-4.0	-2.68e-02±1.08e-02	-4.68e-03±1.14e-02	5.80e-01	-5.73e-02±3.02e-02	1.17e+00
4.0-5.0	-2.04e-03±1.35e-02	-3.49e-03±1.60e-02	4.82e-01	-6.96e-04±3.01e-02	1.15e+00
5.0-6.0	1.16e-02±2.08e-02	-2.08e-02±2.08e-02	4.35e-01	3.66e-02±4.02e-02	1.09e+00
6.0-7.0	-1.64e-02±3.51e-02	-2.08e-02±2.08e-02	4.28e-01	-1.31e-02±6.33e-02	1.03e+00

ERT4x4(AC)-BBCLL1, Eta Signal, lumi Formula, $x_F > 0.01$, Inclusive pseudorapidity					
p_T Bin	A_N^{peak}	$A_N^{background}$	r	A_N^{signal}	τ
2.0-3.0	-2.08e-02±2.25e-02	1.58e-02±2.14e-02	7.70e-01	-1.44e-01±1.21e-01	1.24e+00
3.0-4.0	-2.85e-02±1.06e-02	-4.19e-03±1.12e-02	5.80e-01	-6.20e-02±2.95e-02	1.17e+00
4.0-5.0	-4.43e-03±1.33e-02	-1.77e-03±1.58e-02	4.82e-01	-6.90e-03±2.96e-02	1.15e+00
5.0-6.0	8.26e-03±2.14e-02	-2.71e-02±2.12e-02	4.35e-01	3.55e-02±4.12e-02	1.09e+00
6.0-7.0	6.69e-02±5.68e-02	-2.71e-02±2.12e-02	4.28e-01	1.37e-01±1.00e-01	1.01e+00

D.4 Backward η

ERT4x4(AC)-BBCLL1, pi0 Signal, sqrt Formula, Inclusive x_F, $\eta < -0.2$					
p_T Bin	A_N^{peak}	$A_N^{background}$	r	A_N^{signal}	τ
1.0-2.0	8.74e-04±8.65e-04	-1.09e-03±1.13e-03	3.32e-01	1.85e-03±1.41e-03	1.09e+00
2.0-3.0	1.17e-03±1.07e-03	1.69e-03±2.18e-03	1.51e-01	1.07e-03±1.32e-03	1.05e+00
3.0-4.0	-7.00e-04±2.27e-03	3.16e-03±6.65e-03	7.34e-02	-1.01e-03±2.51e-03	1.02e+00
4.0-5.0	-2.24e-03±4.94e-03	-9.10e-03±1.65e-02	5.58e-02	-1.84e-03±5.32e-03	1.02e+00
5.0-6.0	-4.43e-03±9.88e-03	3.88e-02±3.77e-02	5.13e-02	-6.76e-03±1.06e-02	1.02e+00
6.0-7.0	-7.38e-03±1.79e-02	1.23e-01±9.05e-02	5.55e-02	-1.50e-02±1.97e-02	1.04e+00
7.0-8.0	6.01e-02±3.11e-02	1.23e-01±9.05e-02	5.78e-02	5.62e-02±3.35e-02	1.01e+00
8.0-9.0	-6.59e-03±8.47e-02	1.23e-01±9.05e-02	5.82e-02	-1.46e-02±9.01e-02	1.00e+00

ERT4x4(AC)-BBCLL1, pi0 Signal, lumi Formula, Inclusive x_F, $\eta < -0.2$					
p_T Bin	A_N^{peak}	$A_N^{background}$	r	A_N^{signal}	τ
1.0-2.0	1.15e-03±8.48e-04	-1.40e-03±1.12e-03	3.32e-01	2.42e-03±1.39e-03	1.09e+00
2.0-3.0	1.10e-03±1.06e-03	1.48e-03±2.16e-03	1.51e-01	1.03e-03±1.30e-03	1.05e+00
3.0-4.0	-5.46e-04±2.25e-03	3.50e-03±6.63e-03	7.34e-02	-8.66e-04±2.48e-03	1.02e+00
4.0-5.0	-2.76e-03±4.90e-03	-1.38e-02±1.64e-02	5.58e-02	-2.11e-03±5.28e-03	1.02e+00
5.0-6.0	-4.49e-03±9.81e-03	1.86e-02±6.36e-02	5.13e-02	-5.74e-03±1.09e-02	1.05e+00

ERT4x4(AC)-BBCLL1, Eta Signal, sqrt Formula, Inclusive x_F, $\eta < -0.2$					
p_T Bin	A_N^{peak}	$A_N^{background}$	r	A_N^{signal}	τ
2.0-3.0	1.64e-05±2.34e-03	-1.92e-03±2.23e-03	7.70e-01	6.50e-03±1.26e-02	1.24e+00
3.0-4.0	6.40e-04±5.50e-03	-1.49e-03±5.95e-03	5.80e-01	3.57e-03±1.55e-02	1.18e+00
4.0-5.0	-9.67e-03±1.19e-02	1.87e-02±1.41e-02	4.82e-01	-3.61e-02±2.65e-02	1.15e+00
5.0-6.0	-2.11e-03±2.32e-02	2.93e-02±2.44e-02	4.35e-01	-2.63e-02±4.52e-02	1.10e+00
6.0-7.0	6.03e-02±6.33e-02	2.93e-02±2.44e-02	4.28e-01	8.34e-02±1.12e-01	1.01e+00

ERT4x4(AC)-BBCLL1, Eta Signal, lumi Formula, Inclusive x_F, $\eta < -0.2$					
p_T Bin	A_N^{peak}	$A_N^{background}$	r	A_N^{signal}	τ
2.0-3.0	-4.03e-04±2.30e-03	-2.48e-03±2.19e-03	7.70e-01	6.55e-03±1.24e-02	1.24e+00
3.0-4.0	2.01e-03±5.43e-03	-8.15e-04±5.89e-03	5.80e-01	5.92e-03±1.53e-02	1.18e+00
4.0-5.0	-9.49e-03±1.18e-02	1.73e-02±1.40e-02	4.82e-01	-3.44e-02±2.62e-02	1.15e+00
5.0-6.0	2.71e-03±2.41e-02	4.78e-02±2.55e-02	4.35e-01	-3.20e-02±4.69e-02	1.10e+00

D.5 Forward η

ERT4x4(AC)-BBCLL1, pi0 Signal, sqrt Formula, Inclusive x_F, $\eta > 0.2$					
p_T Bin	A_N^{peak}	$A_N^{background}$	r	A_N^{signal}	τ
1.0-2.0	4.88e-04±8.44e-04	-1.11e-03±1.10e-03	3.32e-01	1.28e-03±1.38e-03	1.09e+00
2.0-3.0	1.76e-03±1.05e-03	-1.07e-03±2.13e-03	1.51e-01	2.26e-03±1.29e-03	1.05e+00
3.0-4.0	1.61e-03±2.23e-03	-3.42e-03±6.47e-03	7.34e-02	2.01e-03±2.46e-03	1.02e+00
4.0-5.0	2.70e-03±4.82e-03	-2.65e-03±1.60e-02	5.58e-02	3.02e-03±5.19e-03	1.02e+00
5.0-6.0	1.06e-02±9.62e-03	-3.31e-02±3.61e-02	5.13e-02	1.30e-02±1.03e-02	1.02e+00
6.0-7.0	-3.15e-02±1.75e-02	-4.24e-02±7.76e-02	5.55e-02	-3.09e-02±1.90e-02	1.03e+00
7.0-8.0	-5.88e-02±3.02e-02	-4.24e-02±7.76e-02	5.78e-02	-5.98e-02±3.25e-02	1.01e+00
8.0-9.0	3.05e-02±7.10e-02	-4.24e-02±7.76e-02	5.82e-02	3.50e-02±7.56e-02	1.00e+00

ERT4x4(AC)-BBCLL1, pi0 Signal, lumi Formula, Inclusive x_F, $\eta > 0.2$					
p_T Bin	A_N^{peak}	$A_N^{background}$	r	A_N^{signal}	τ
1.0-2.0	6.98e-04±8.23e-04	-1.03e-03±1.08e-03	3.32e-01	1.56e-03±1.35e-03	1.09e+00
2.0-3.0	1.69e-03±1.03e-03	-1.17e-03±2.10e-03	1.51e-01	2.20e-03±1.27e-03	1.05e+00
3.0-4.0	1.71e-03±2.20e-03	-4.73e-03±6.44e-03	7.34e-02	2.22e-03±2.42e-03	1.02e+00
4.0-5.0	1.24e-03±4.77e-03	-4.89e-03±1.59e-02	5.58e-02	1.60e-03±5.14e-03	1.02e+00
5.0-6.0	1.22e-02±9.55e-03	-5.81e-02±5.38e-02	5.13e-02	1.60e-02±1.05e-02	1.04e+00

ERT4x4(AC)-BBCLL1, Eta Signal, sqrt Formula, Inclusive x_F, $\eta > 0.2$					
p_T Bin	A_N^{peak}	$A_N^{background}$	r	A_N^{signal}	τ
2.0-3.0	-3.79e-03±2.29e-03	3.67e-04±2.18e-03	7.70e-01	-1.77e-02±1.23e-02	1.24e+00
3.0-4.0	-8.72e-03±5.39e-03	1.04e-02±5.83e-03	5.80e-01	-3.51e-02±1.51e-02	1.18e+00
4.0-5.0	-4.89e-03±1.16e-02	-3.48e-03±1.38e-02	4.82e-01	-6.20e-03±2.59e-02	1.15e+00
5.0-6.0	-9.79e-05±2.27e-02	-5.04e-03±2.37e-02	4.35e-01	3.71e-03±4.41e-02	1.10e+00
6.0-7.0	-1.80e-02±5.37e-02	-5.04e-03±2.37e-02	4.28e-01	-2.77e-02±9.54e-02	1.02e+00

ERT4x4(AC)-BBCLL1, Eta Signal, lumi Formula, Inclusive x_F, $\eta > 0.2$					
p_T Bin	A_N^{peak}	$A_N^{background}$	r	A_N^{signal}	τ
2.0-3.0	-3.54e-03±2.24e-03	-2.24e-04±2.13e-03	7.70e-01	-1.47e-02±1.21e-02	1.24e+00
3.0-4.0	-8.96e-03±5.31e-03	1.06e-02±5.75e-03	5.80e-01	-3.59e-02±1.49e-02	1.18e+00
4.0-5.0	-7.39e-03±1.15e-02	-6.53e-03±1.36e-02	4.82e-01	-8.19e-03±2.55e-02	1.15e+00
5.0-6.0	5.08e-03±2.34e-02	-1.37e-02±2.46e-02	4.35e-01	1.96e-02±4.55e-02	1.10e+00

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