Update
Gap-X-Gap studies
for √s = 1960GeV, 900GeV
X = 2 hadrons

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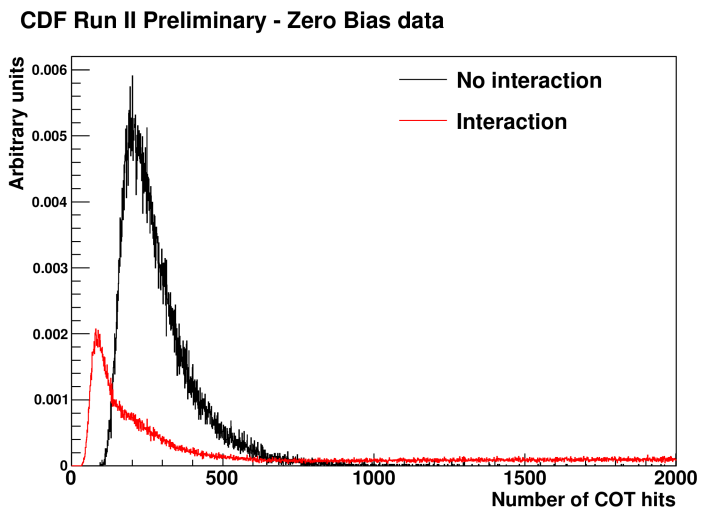
Contents

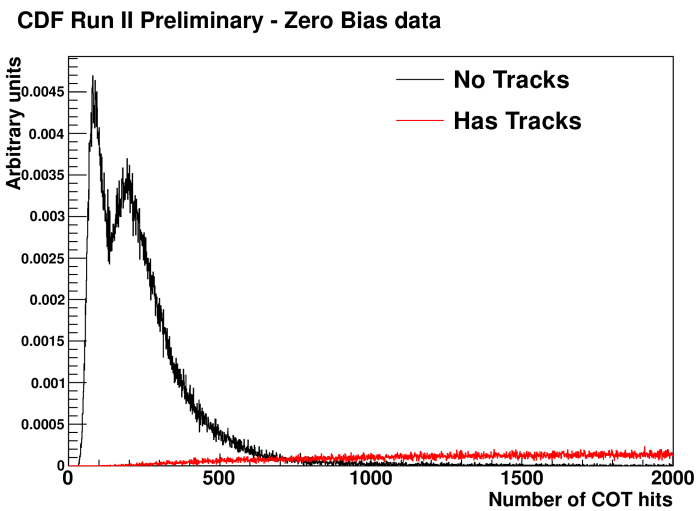
- COT information
- Gap + exclusivity cuts - update
- Trigger efficiency
- Invariant mass
- Systematics
- Tail fitting
- Mean Pt
- Chi_c

Cot information

1'st attempt – final 2 track sample, same/opposite charge events – no visible separation or cut in many checked variables.

2'nd attempt – Interaction - non interaction samples from ZB





Cot – summary and plan

No simple cuts, no visible separation.

Next idea:

Find consecutive hits in layers-cells space, apart from reconstructed tracks.

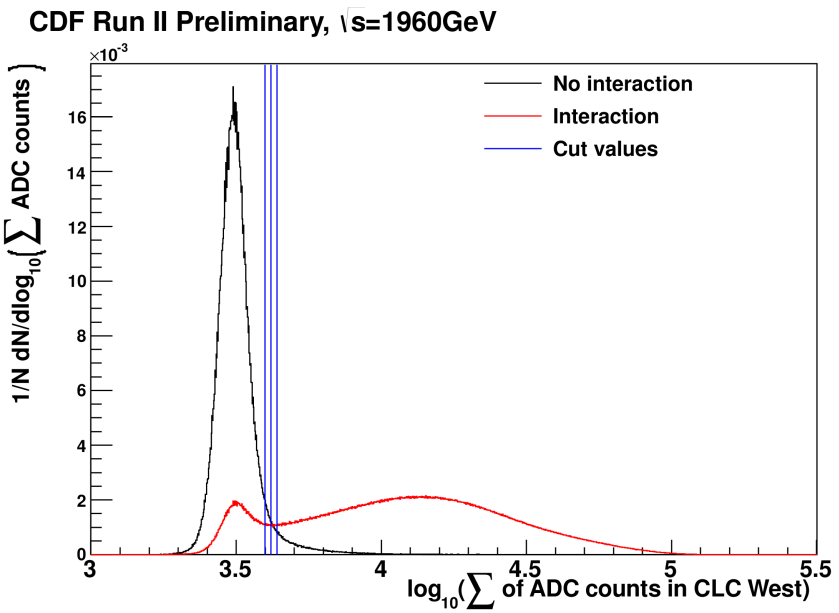
Gap + exclusivity cuts – update:

Included possible assymetry

Defined separately for 1960/900

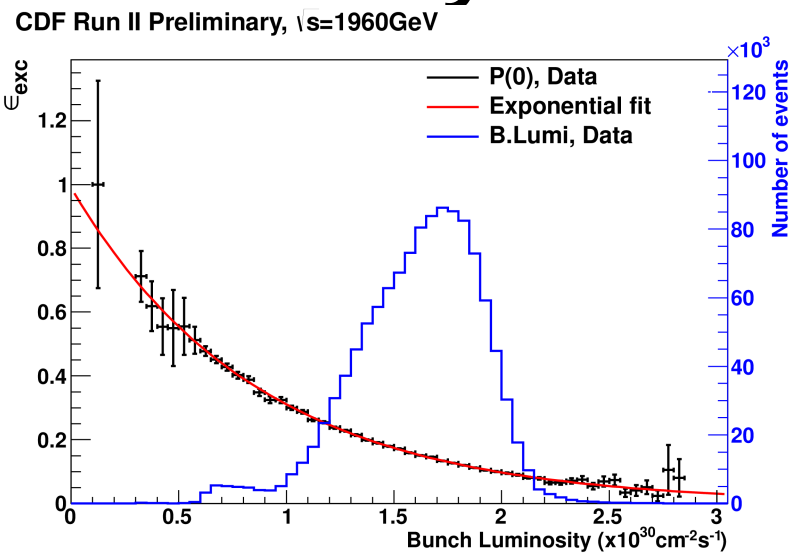
Loose/Tight cuts for systematics

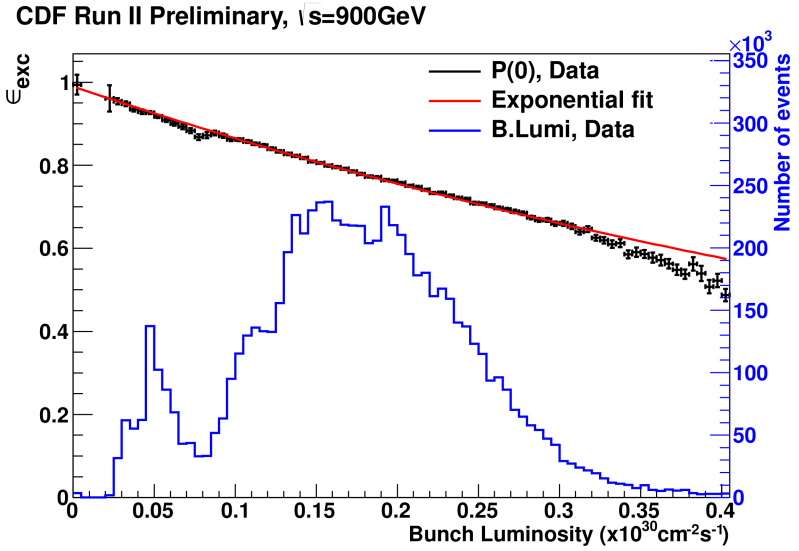
All plots are in backup



Effective exclusive luminosity

- We determine efficiency of having no-pileup using zero-bias sample. We measure ratio of empty events (all detectors on noise level) to all events.
- Should drop exponentially with bunch luminosity and be equal 1 at L=0. Slope corresponds to total visible inelastic cross section:
  - 53.88 mb – 1960 GeV
  - 62.76 mb – 900 GeV
- Effective luminosities:
  - 1.18/pb – 1960 GeV
  - 0.059/pb – 900 GeV



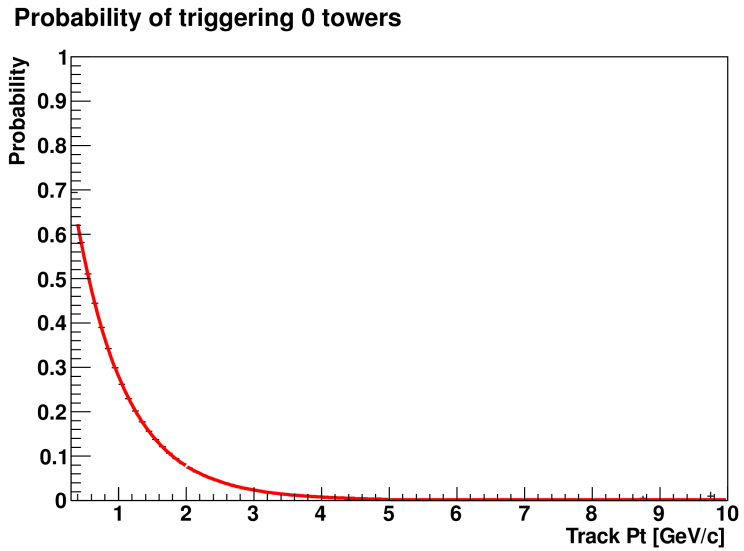


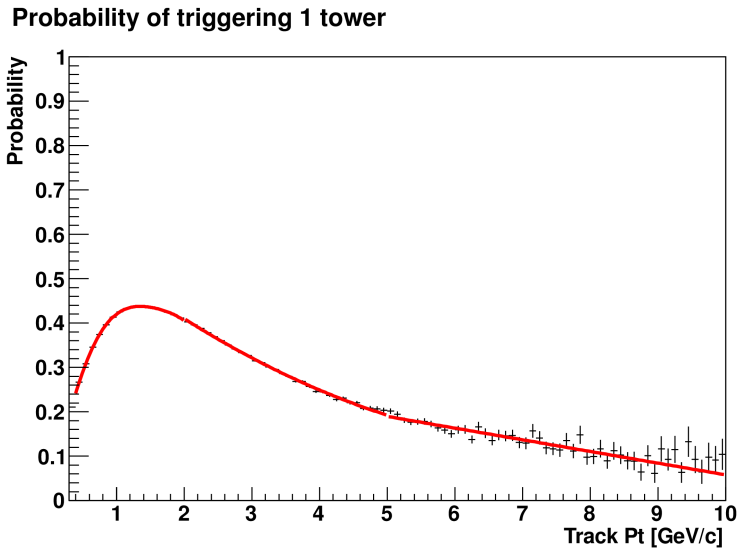
Trigger efficiency:

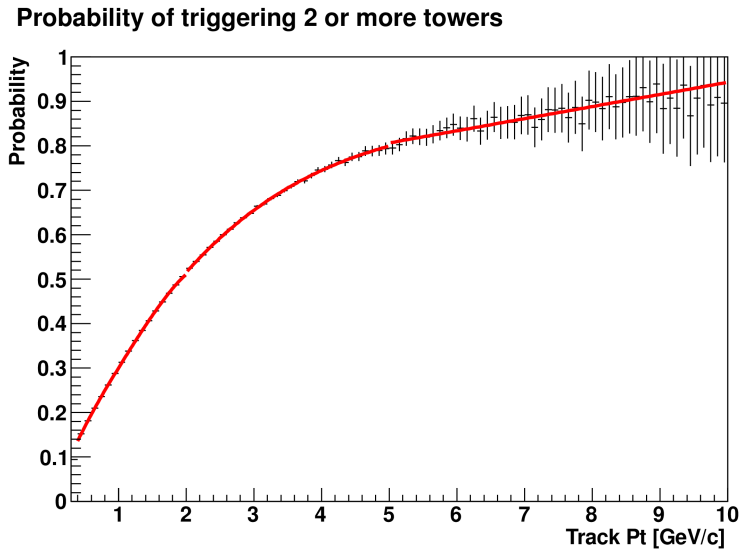
1. Select min-bias data, good quality isolated (no other tracks in cone with r=0.4) tracks.
2. Check how often they fired 0, 1, 2 or more trigger towers (>= 4 bits) in 3x3 box around track extrapolation.
3. Trigger efficiency composed from those 3 probability functions.

$$Eff = P_2(pt1)+P_1(pt1)*(P_1(pt2)+P_2(pt2))+P_0(pt1)*P_2(pt2)$$

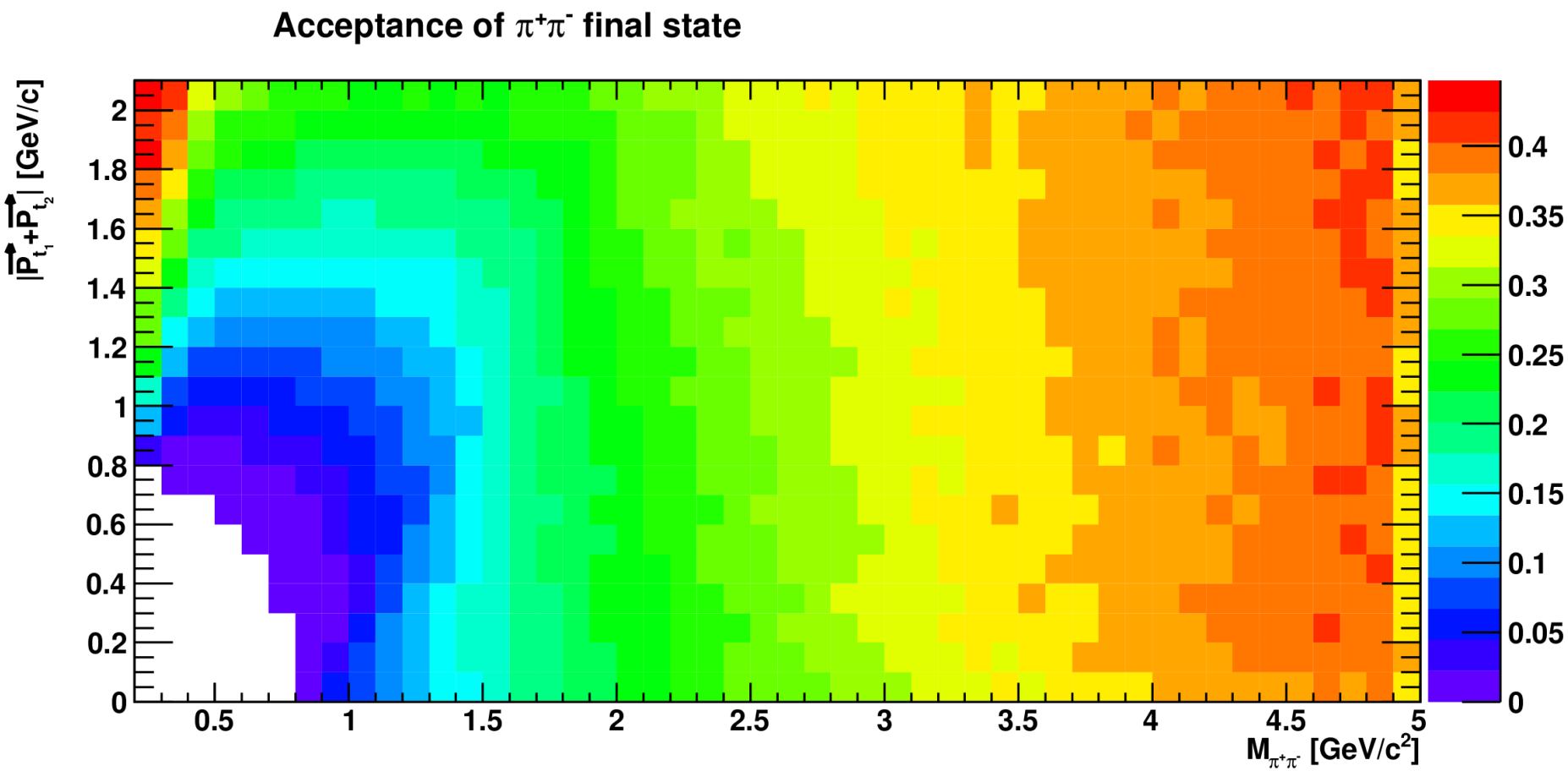
Probability functions:



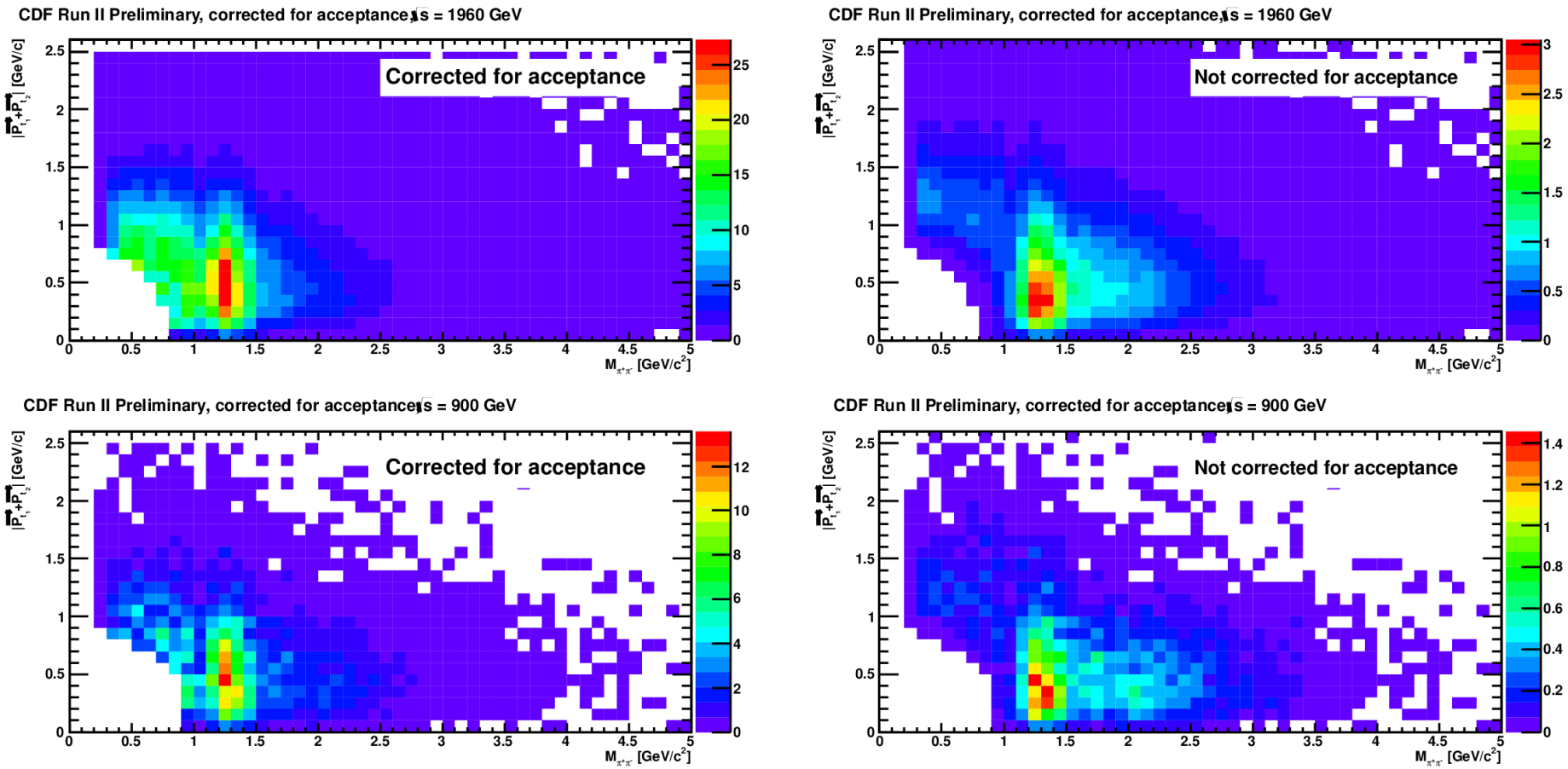




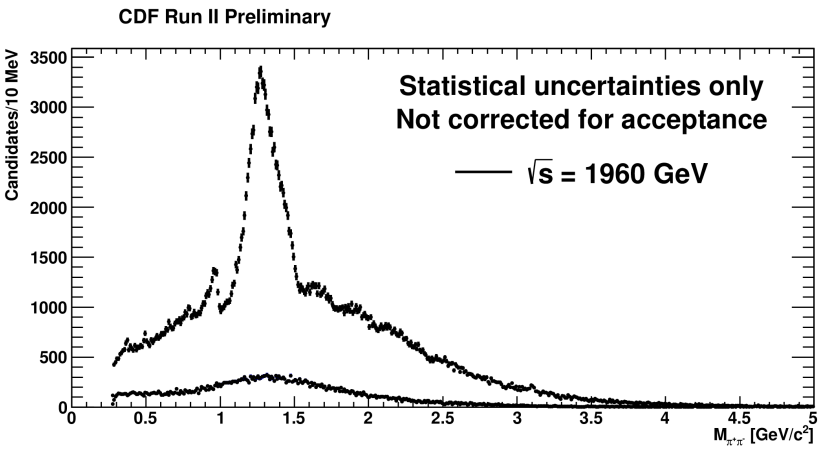
Acceptance

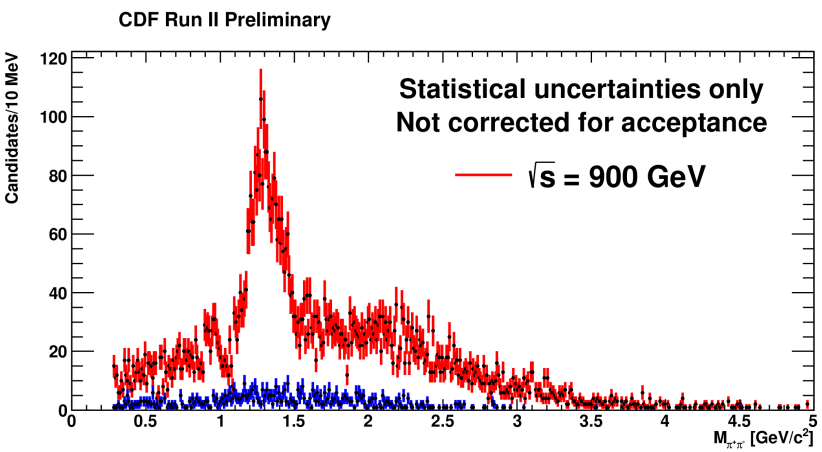

Acceptance of $\pi^+\pi^-$ final state
$|\vec{P}_{t_1}+\vec{P}_{t_2}|$ [GeV/c]
$M_{\pi^+\pi^-}$ [GeV/c^2]
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4

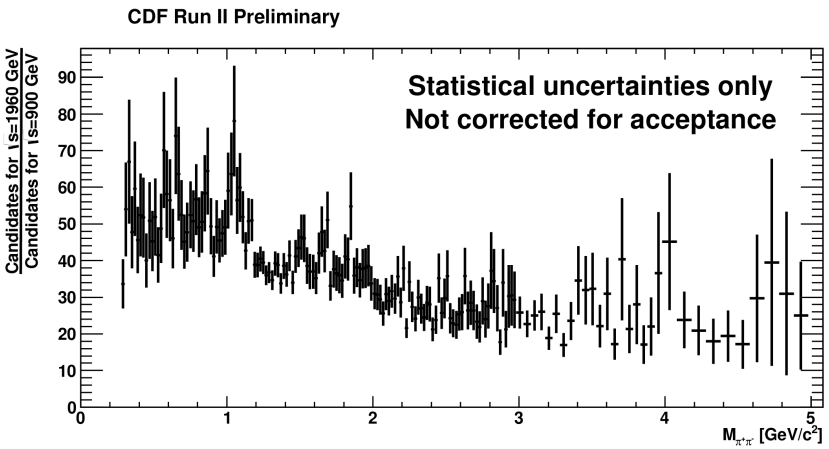
Invariant Mass vs Pt



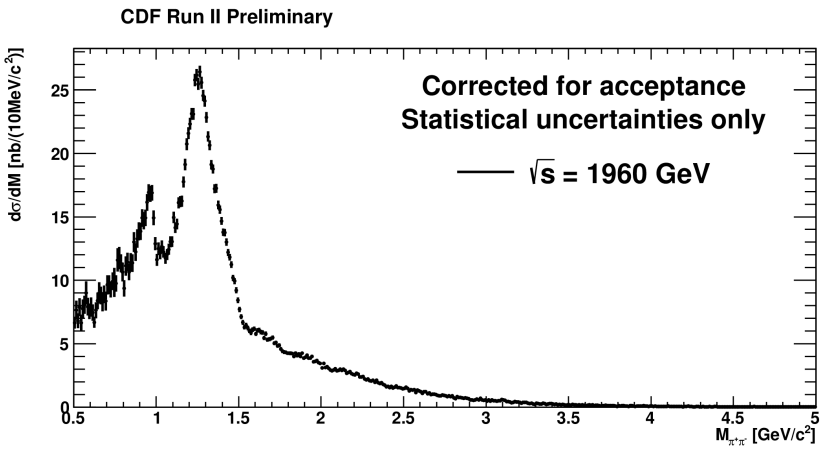
Invariant Mass, not corrected

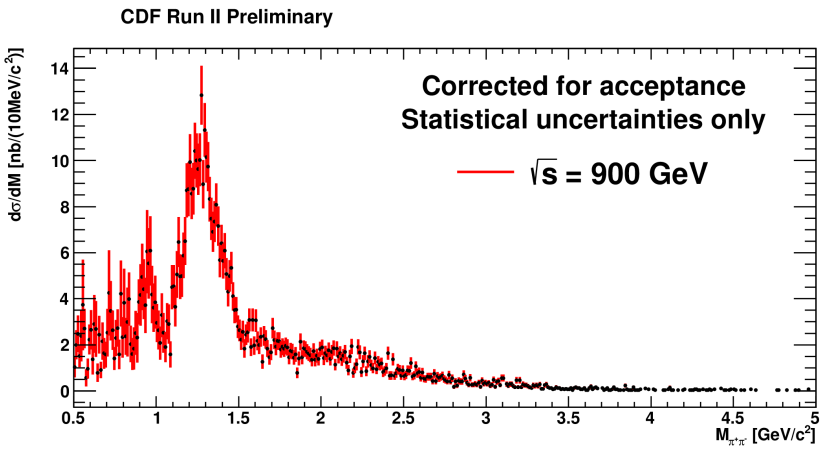


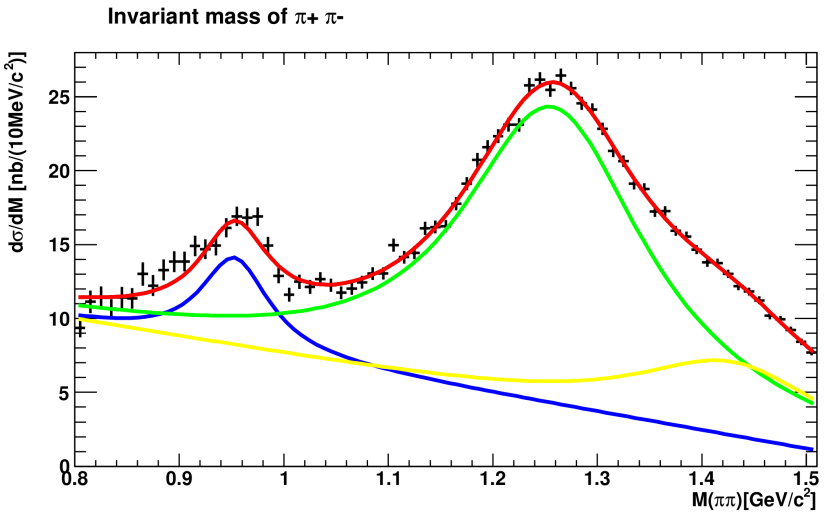




Invariant Mass, corrected







Systematics first summary

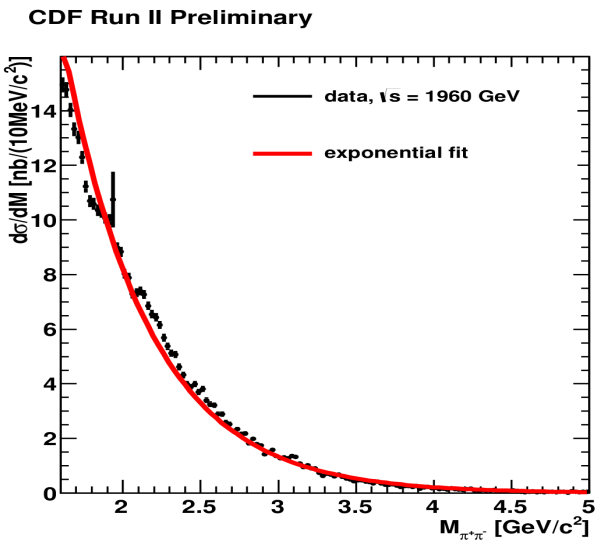
D0	-	0.5%
Pt	-	2.0%
Excl	-	15%
BSC	-	2.0%
CLC	-	0.4%
Plug	-	6.0%
3D Angle	-	0,2%
Z0	-	2.0%
COT hits	-	0.8%
Chi^2	-	3.0%
Luminosity	-	6.0%

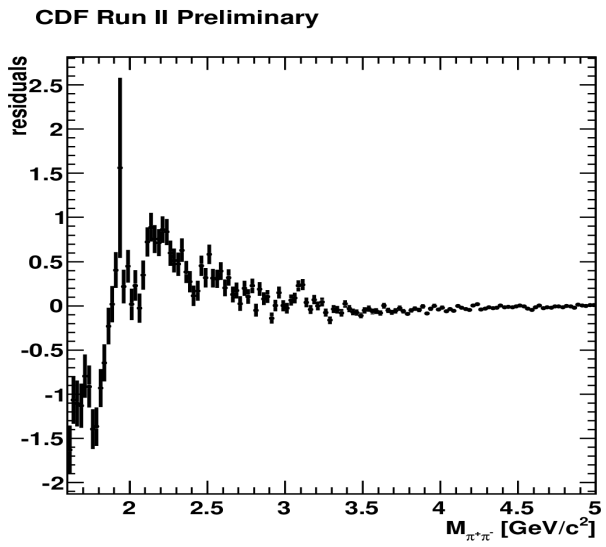
Trigger efficiency systematics is on the way,

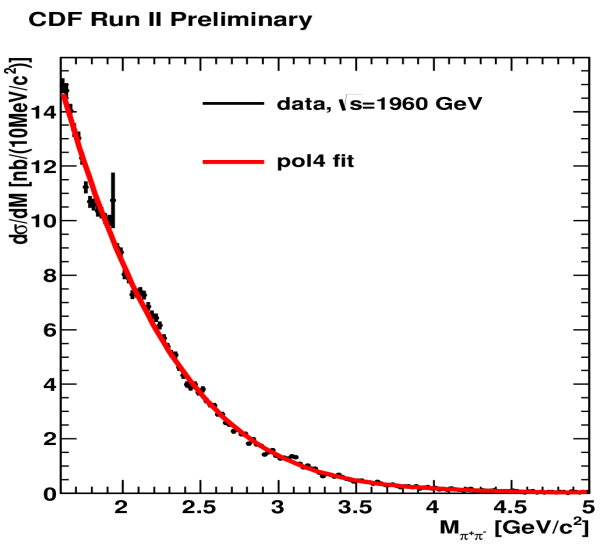
Pt systematics is strongly dependent of mass

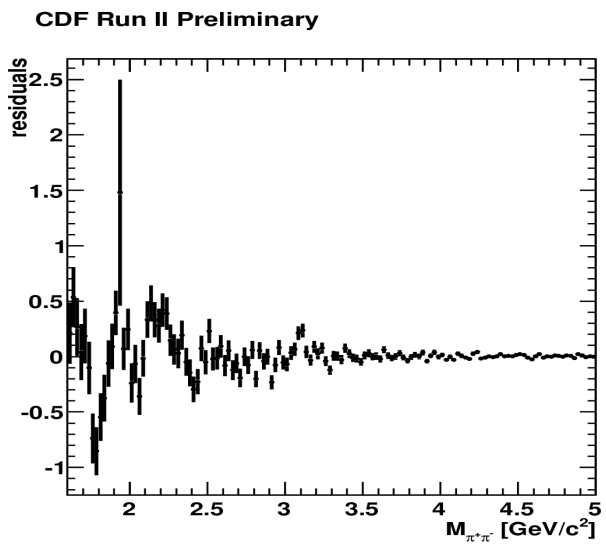
Exclusivity systematics is investigated

Tails – 1960 GeV

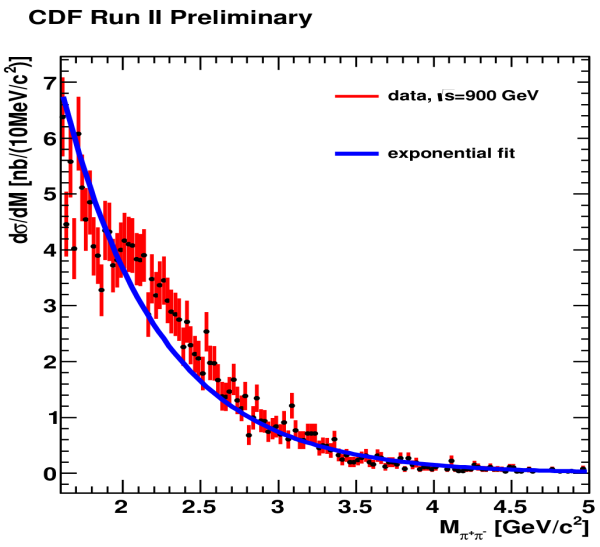


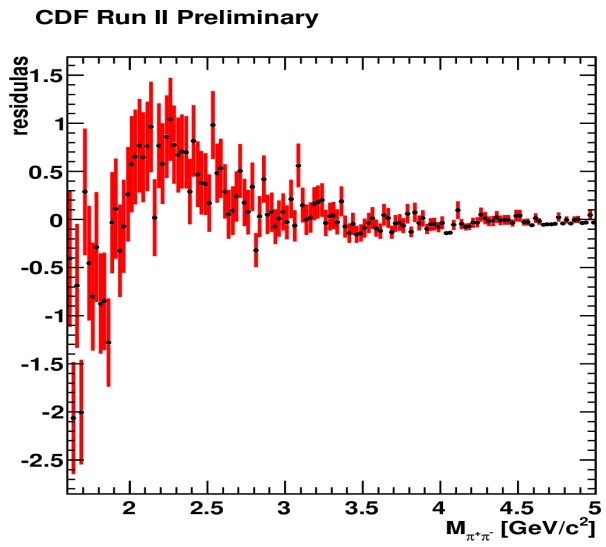


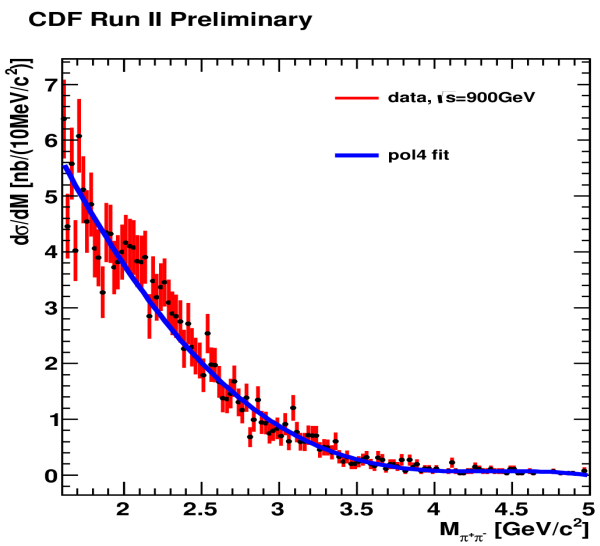


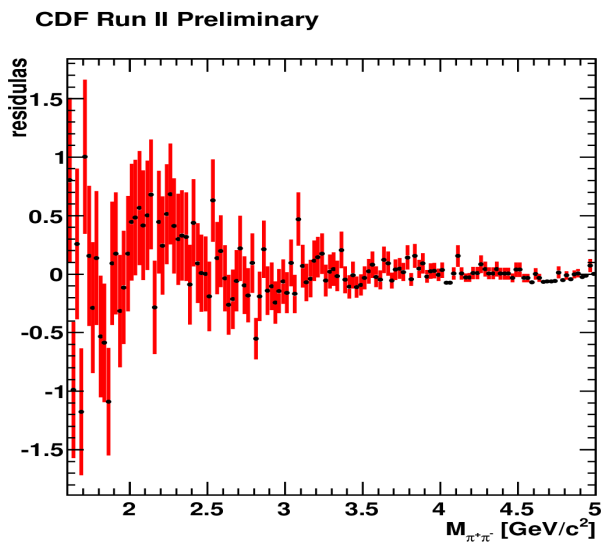


Tails – 900 GeV

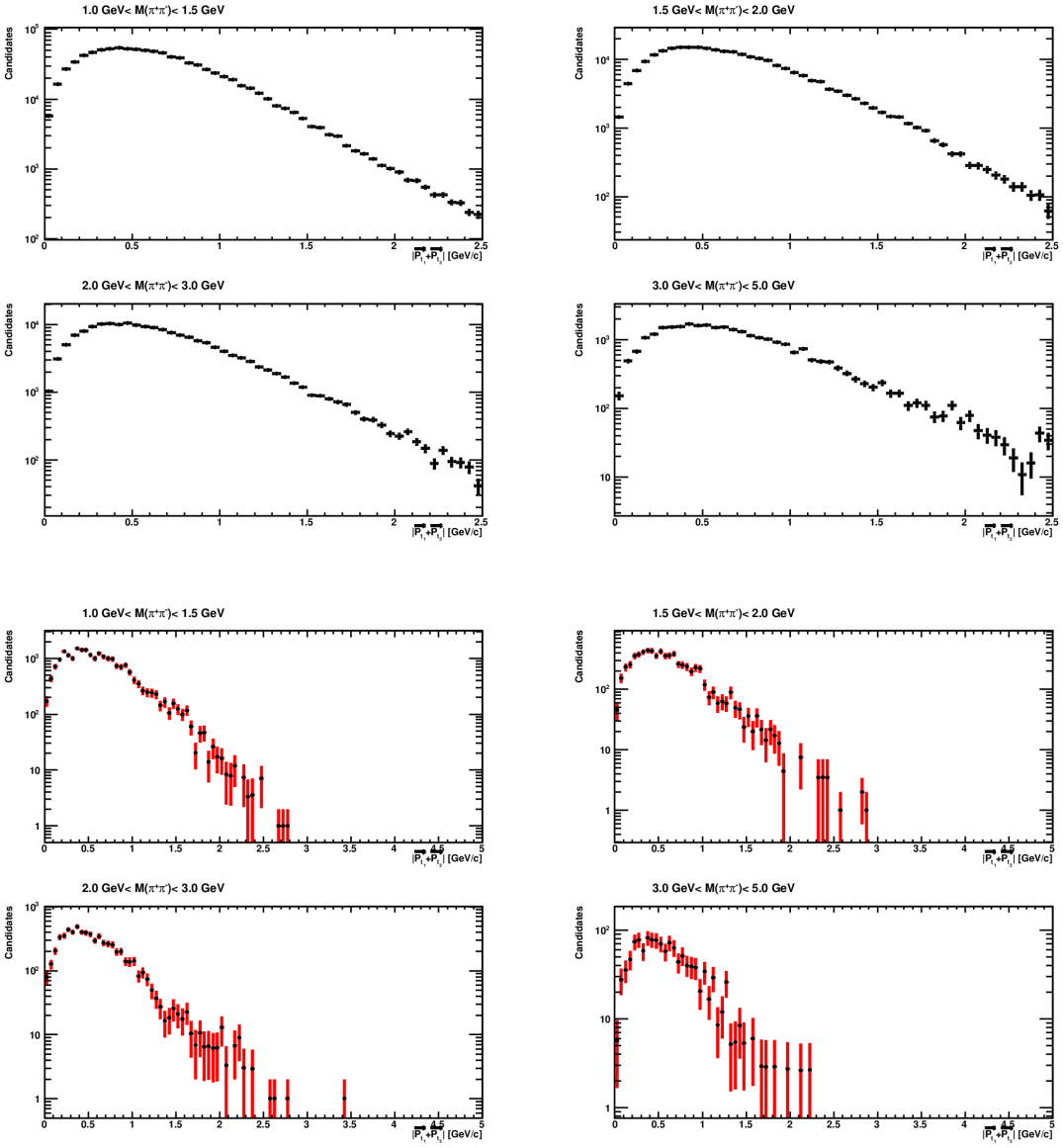




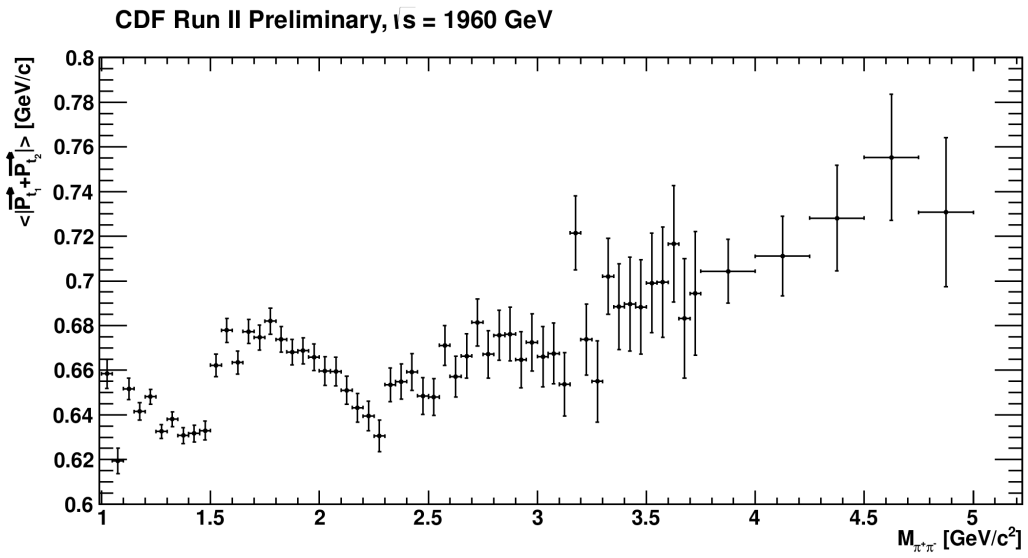


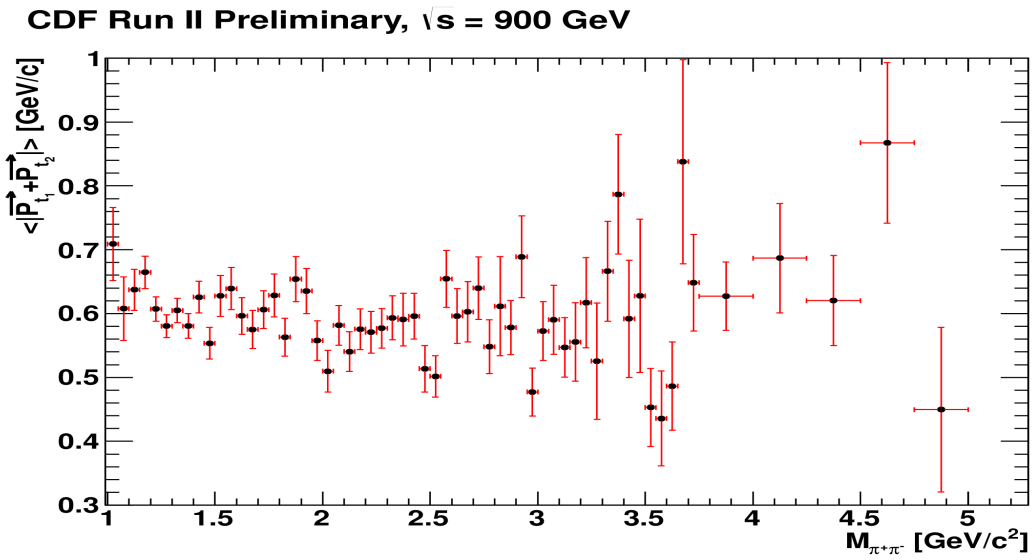


Pt distributions

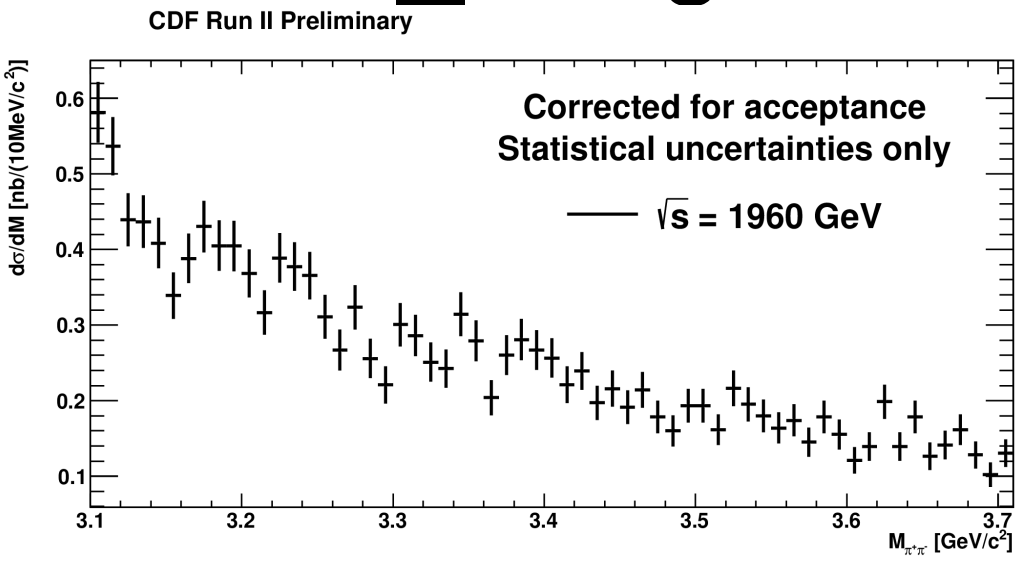


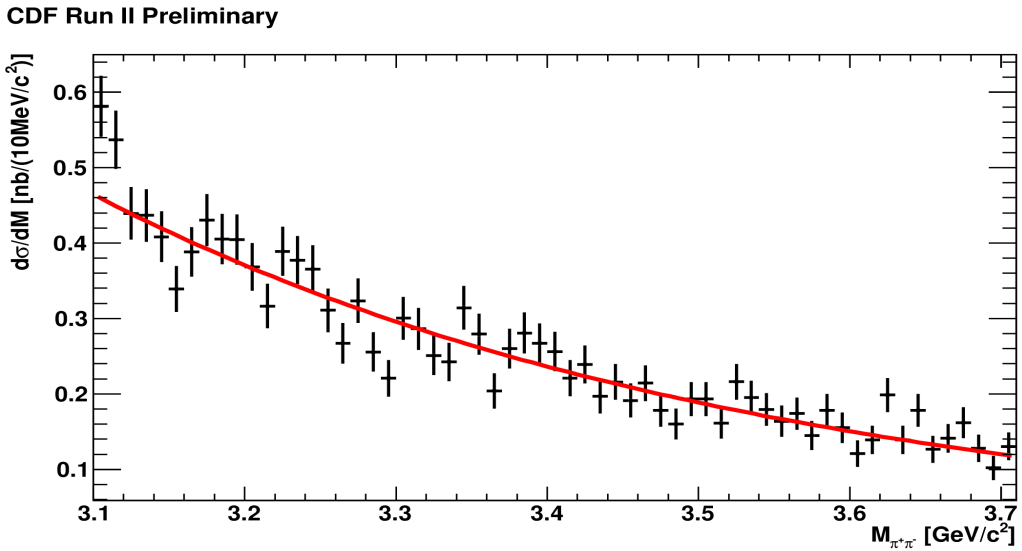
Mean Pt as a function of Inv Mass



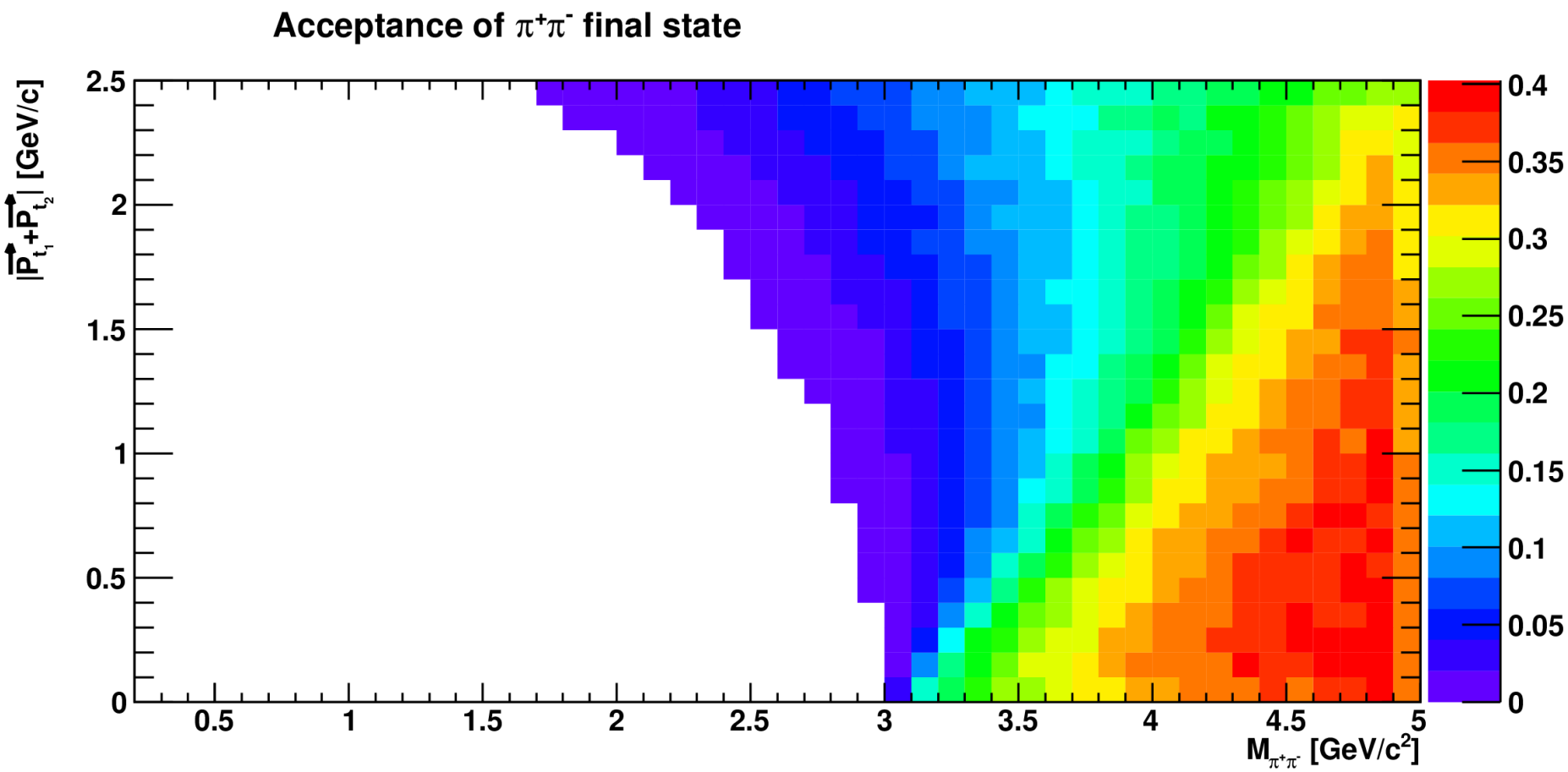


Chi_c region

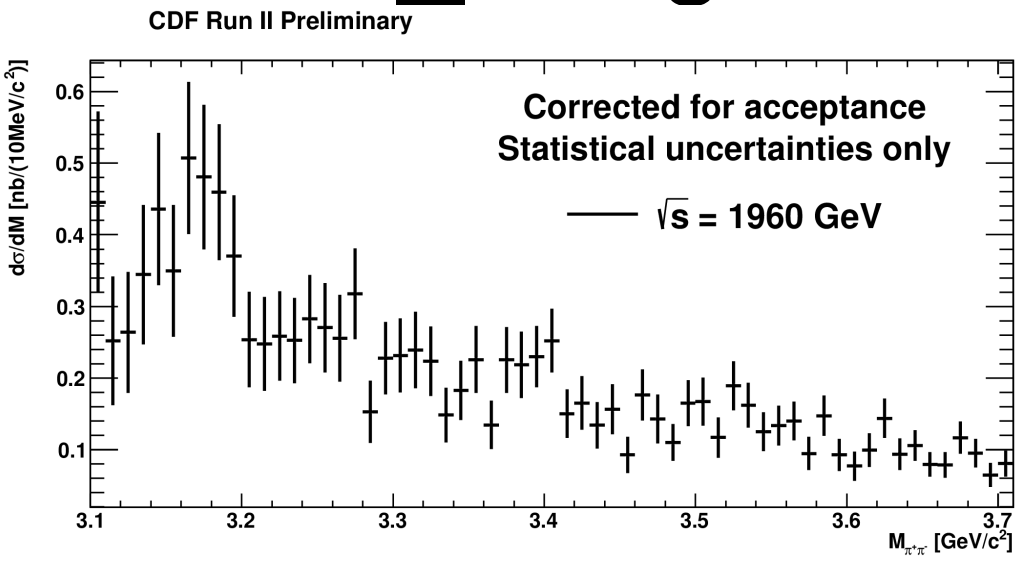

CDF Run II Preliminary
Corrected for acceptance
Statistical uncertainties only
√s = 1960 GeV
dσ/dM [nb/(10MeV/c²)]
M_π+π- [GeV/c²]


CDF Run II Preliminary
dσ/dM [nb/(10MeV/c²)]
M_π+π- [GeV/c²]

Pt > 1.5 S/B enchancment cut



Chi_c region


CDF Run II Preliminary
Corrected for acceptance
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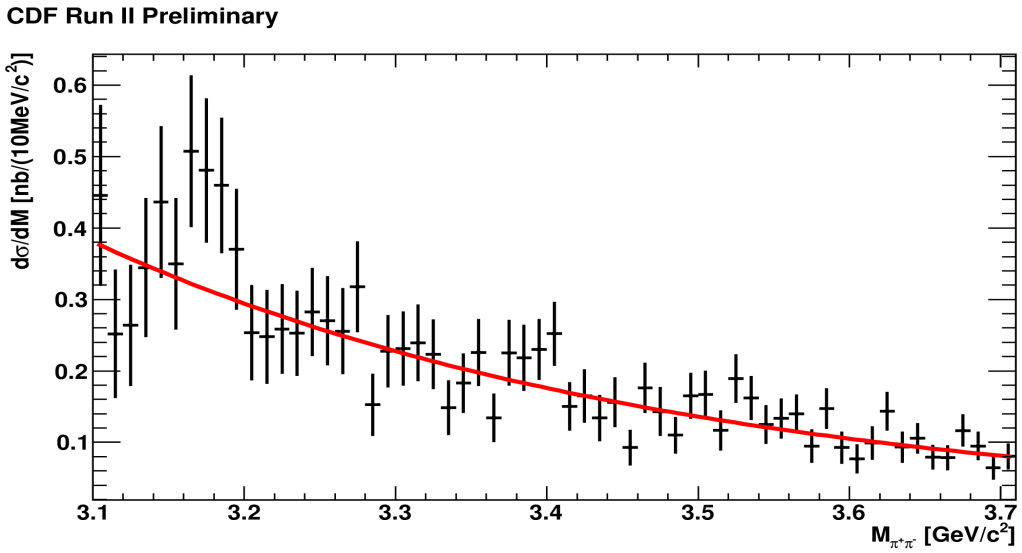
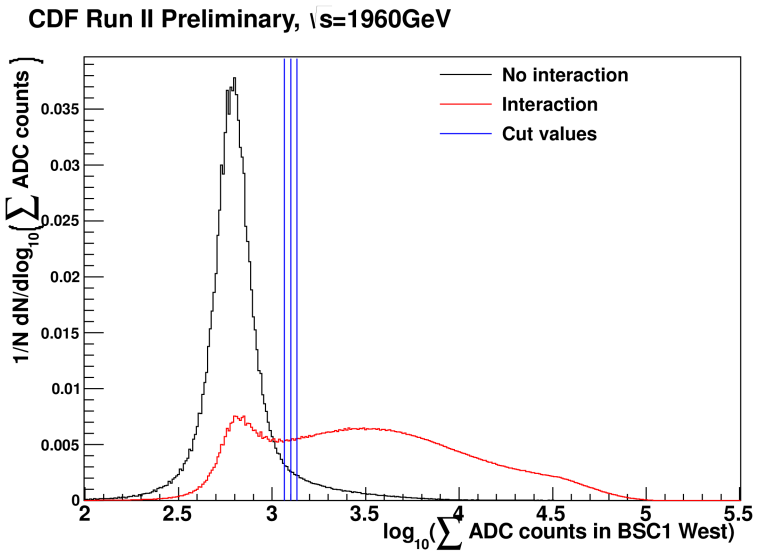
√s = 1960 GeV
dσ/dM [nb/(10MeV/c²)]
M π⁺π⁻ [GeV/c²]

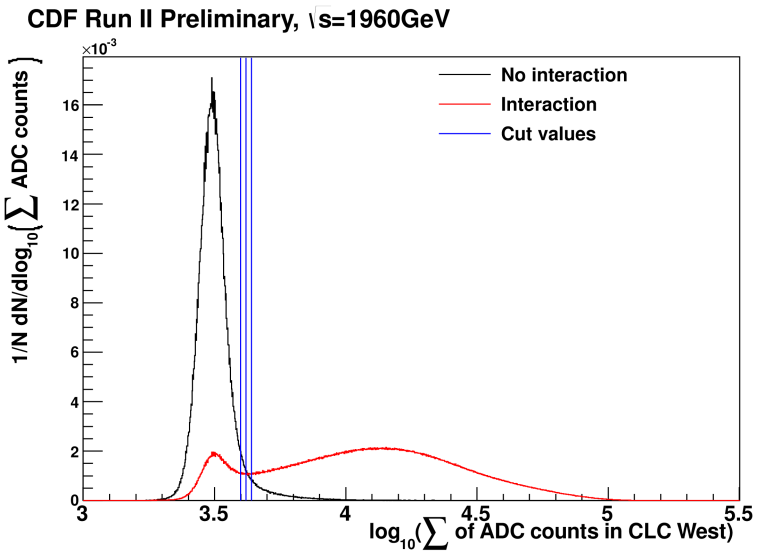

CDF Run II Preliminary
dσ/dM [nb/(10MeV/c²)]
M π⁺π⁻ [GeV/c²]

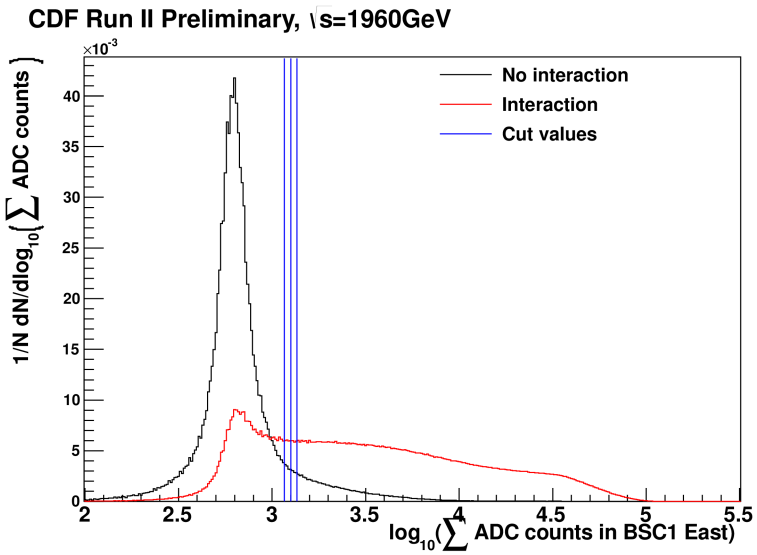
Thank you

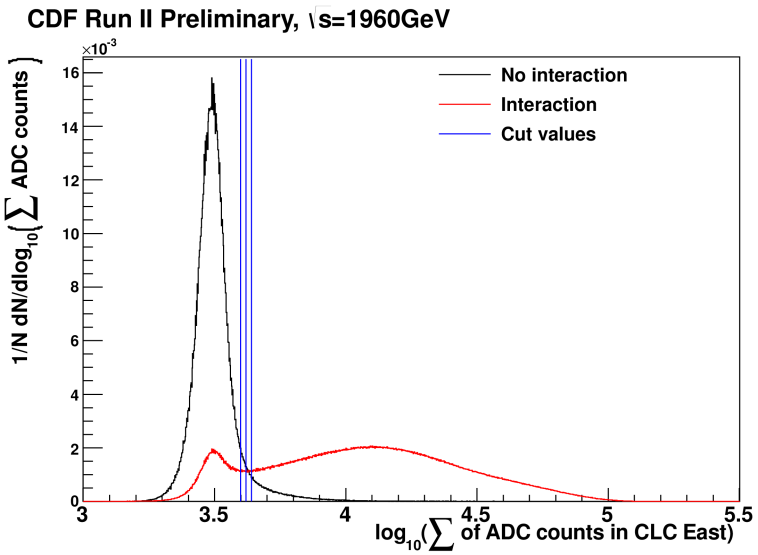
Backup

Forward cuts – 1960 GeV

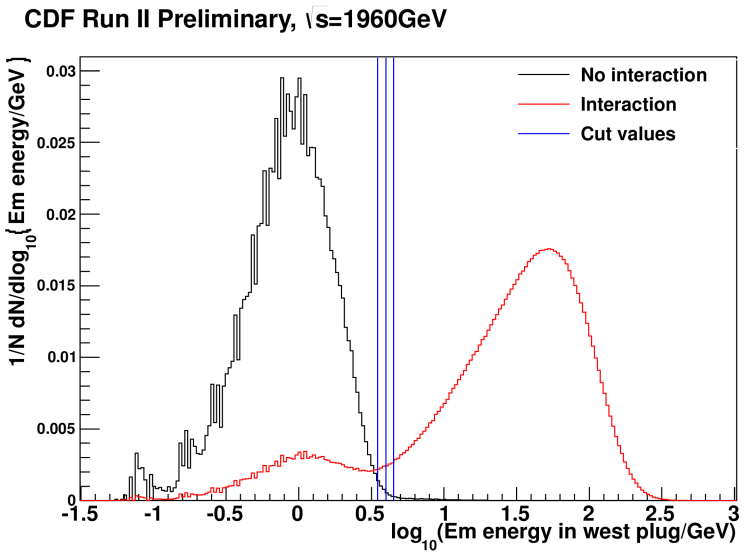


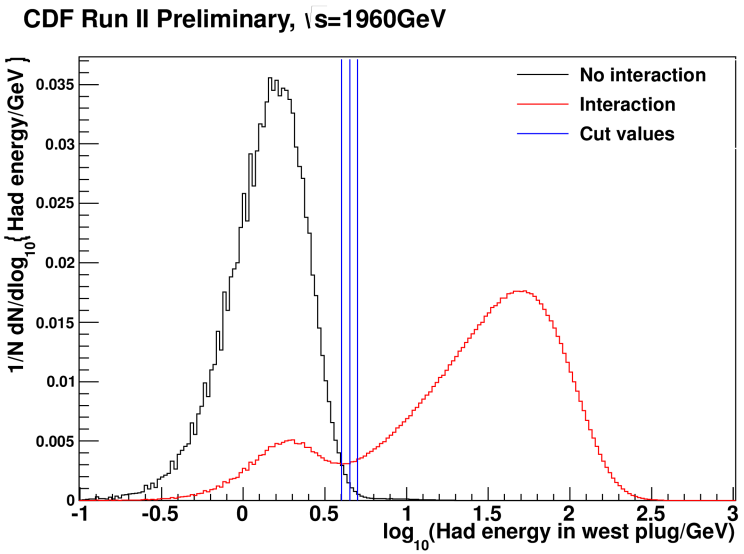


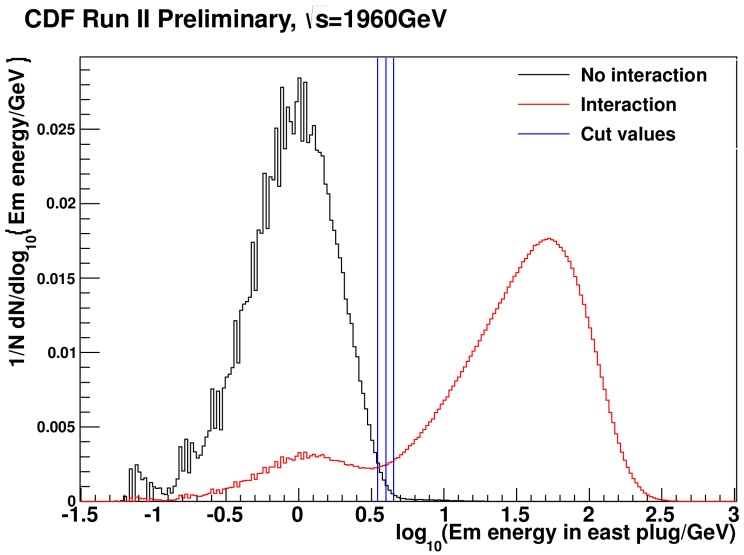


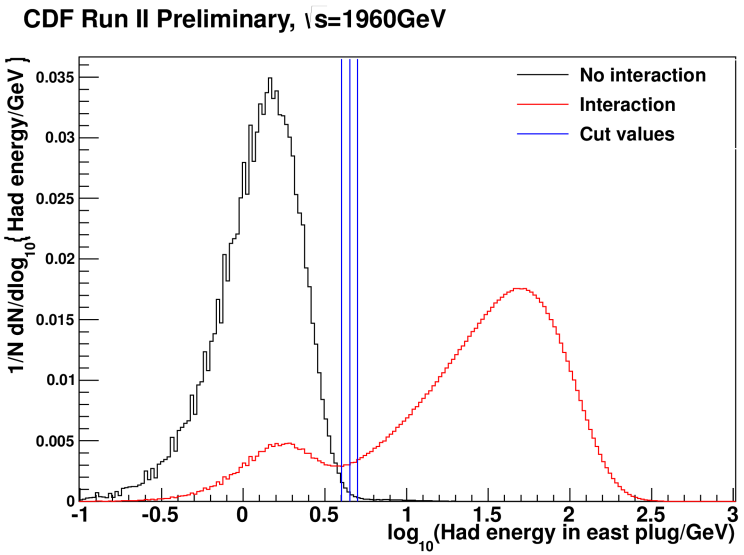


Forward cuts – 1960 GeV

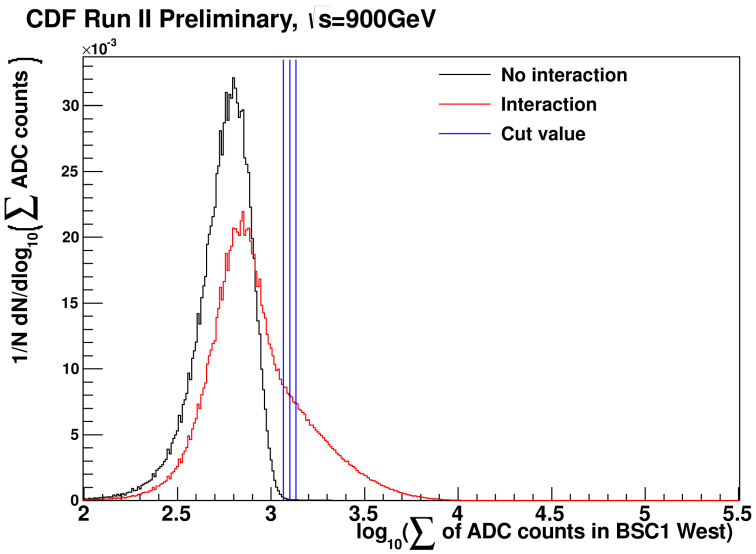


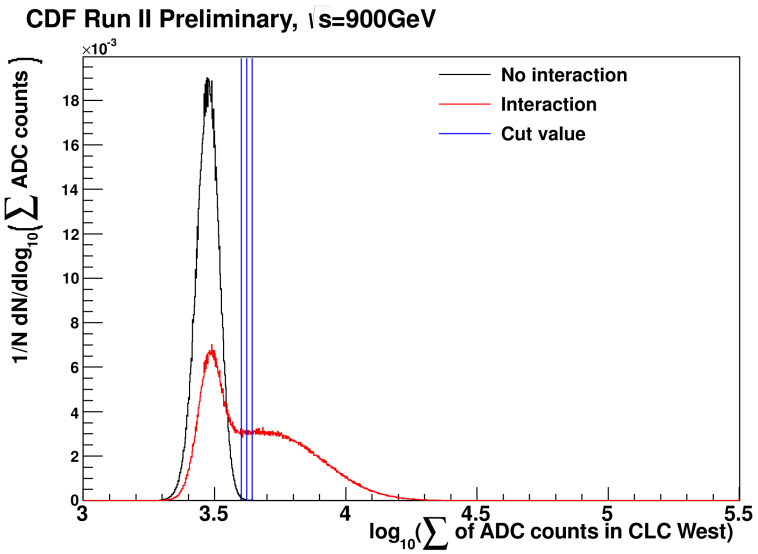


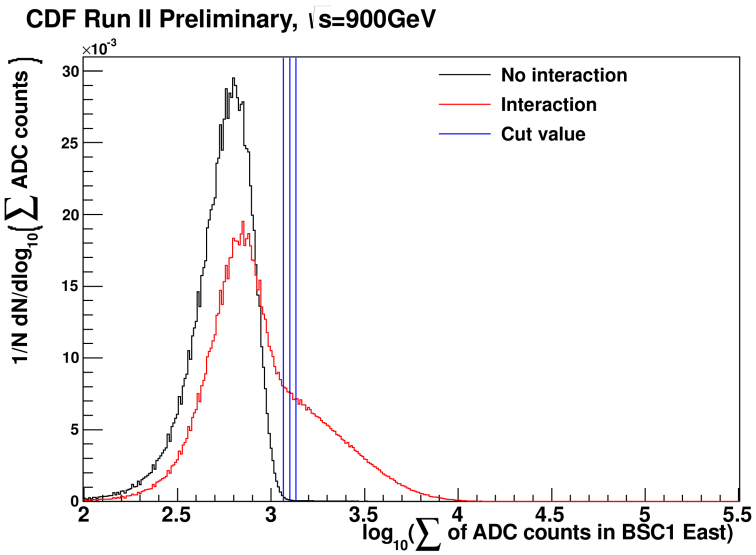


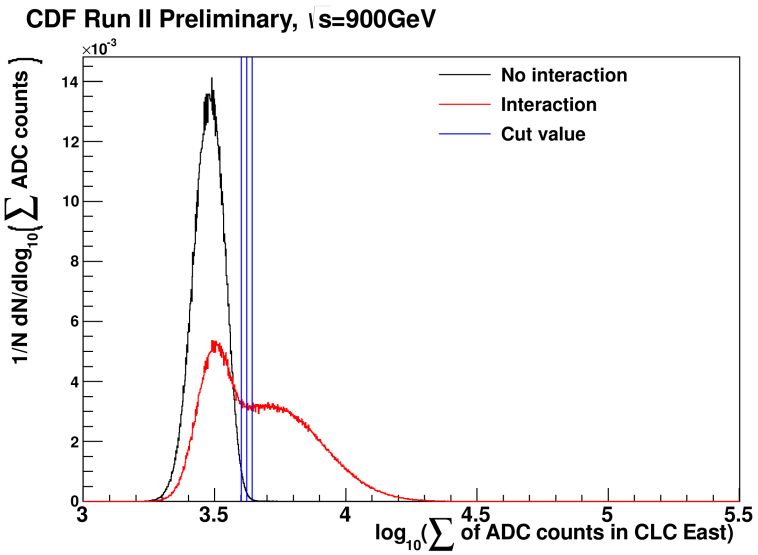


Forward cuts – 900 GeV

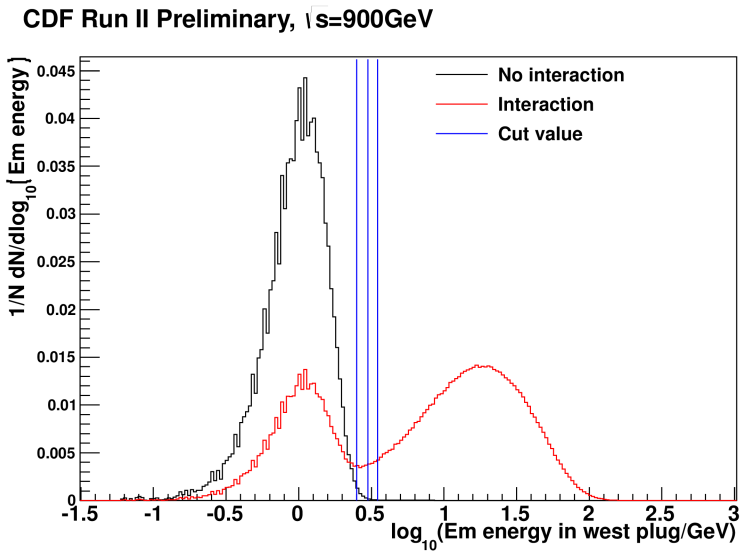


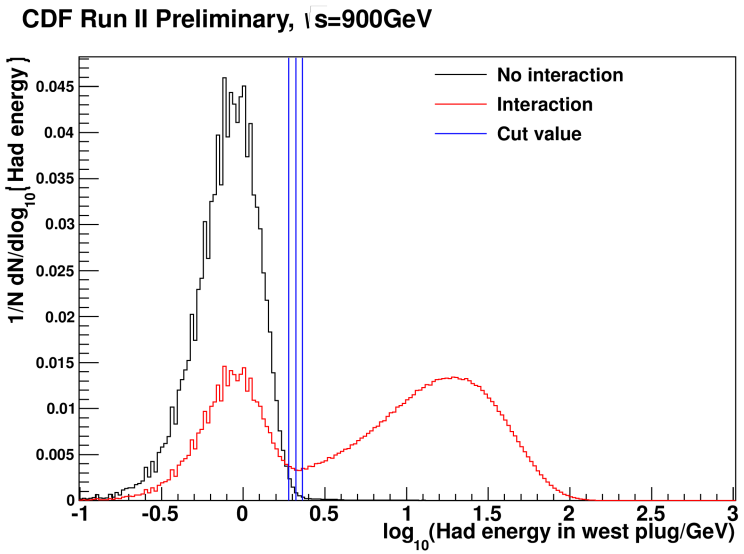


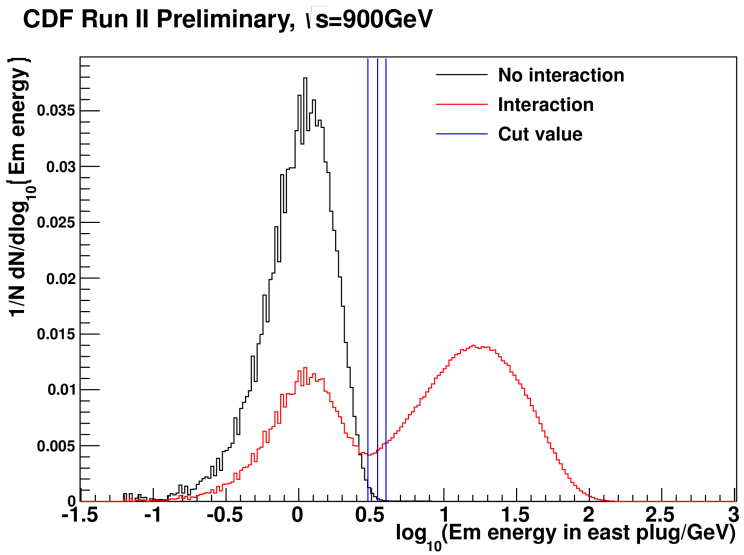


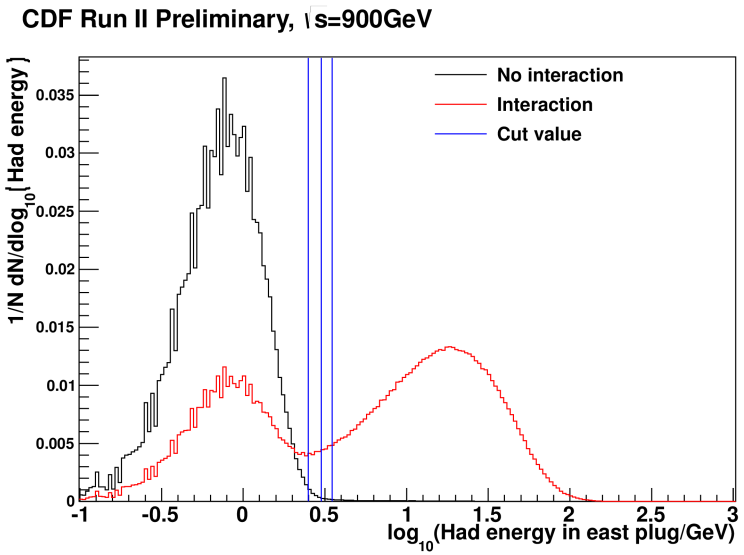


Forward cuts – 900 GeV

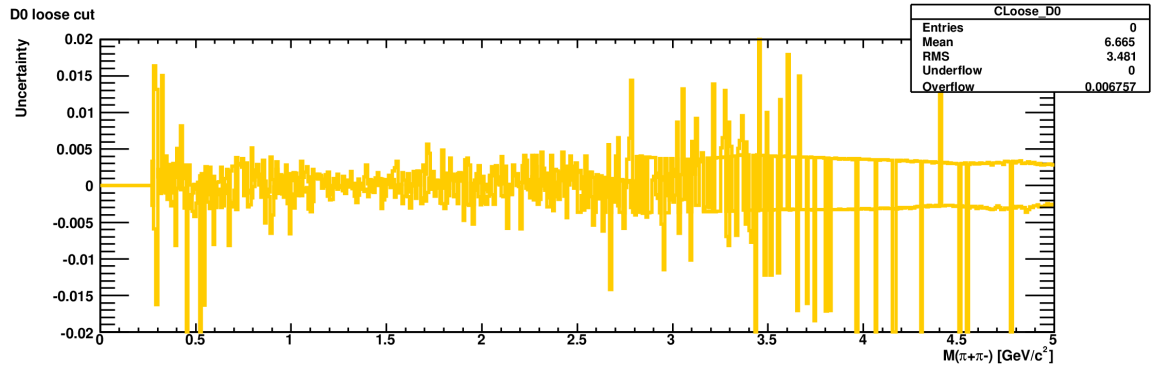


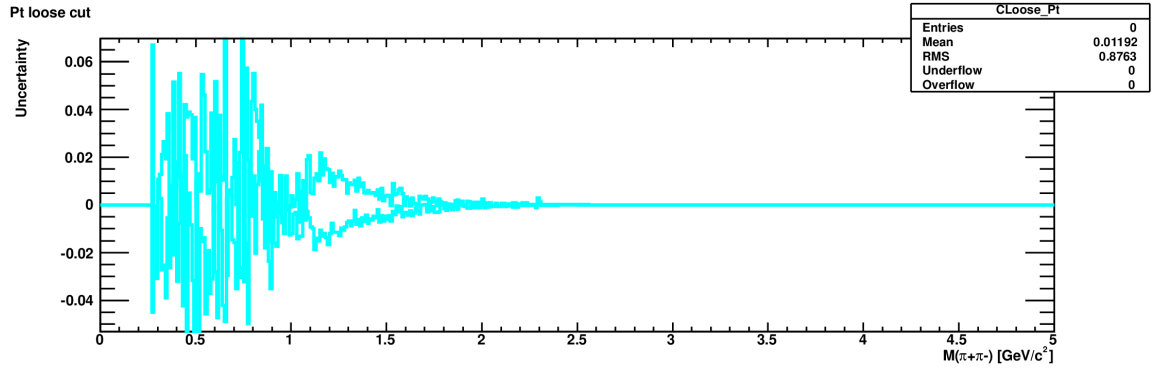


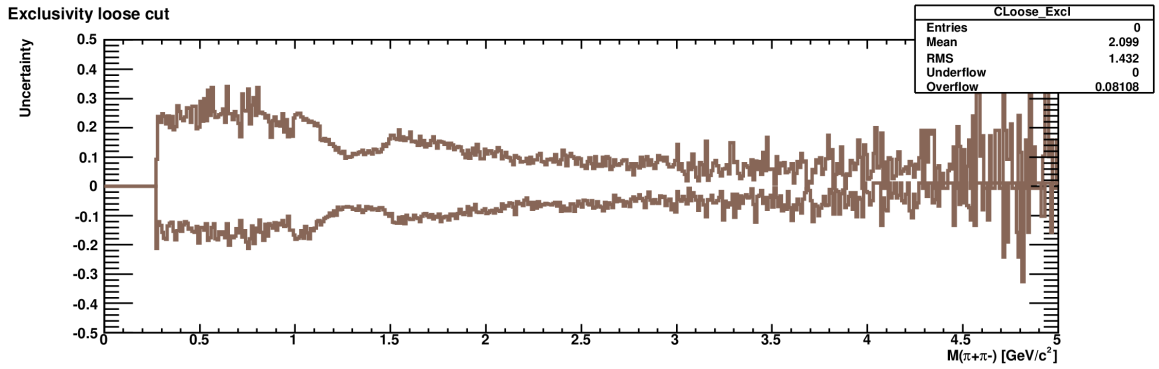




Systematics (1)







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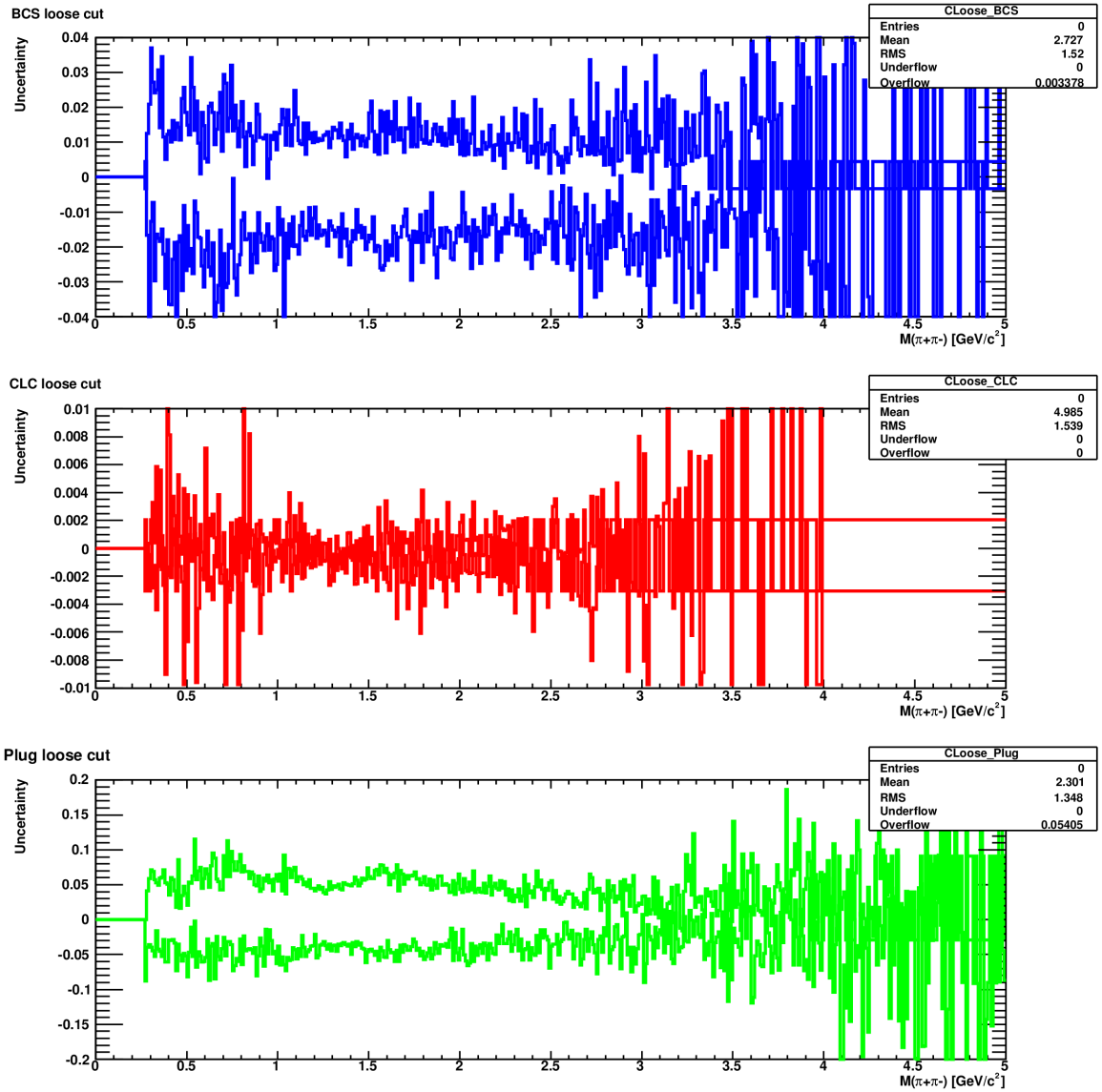

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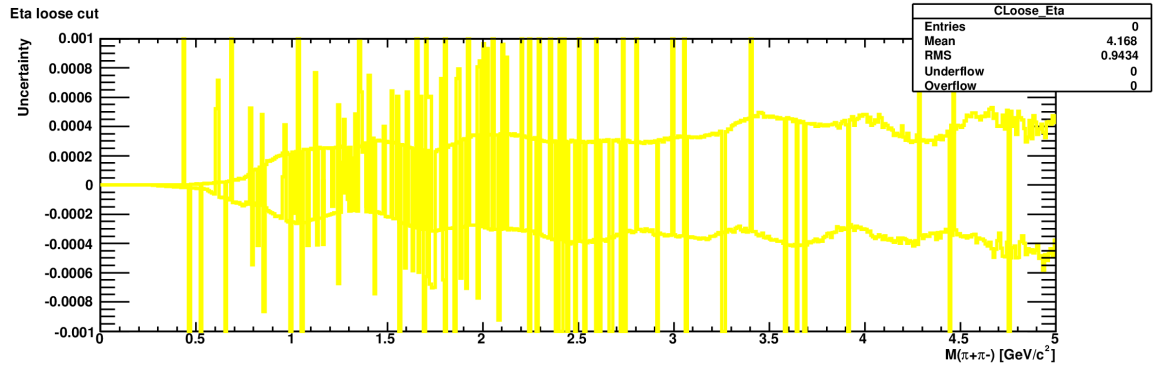
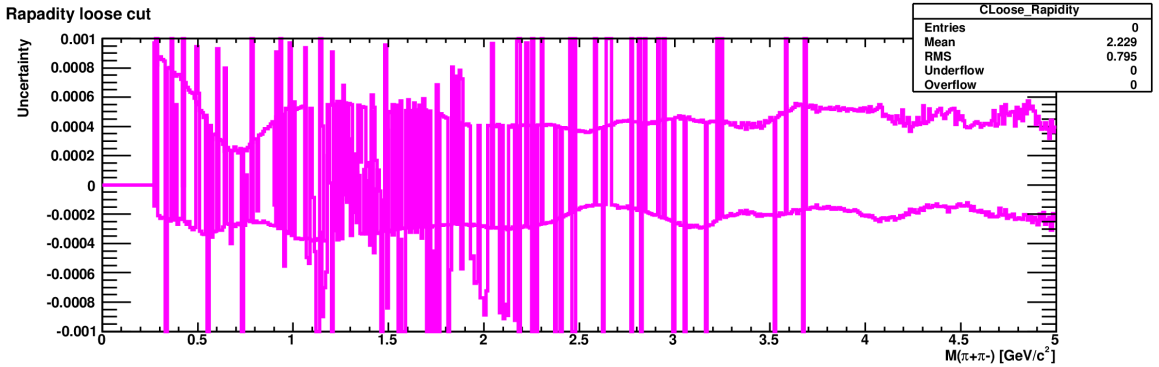
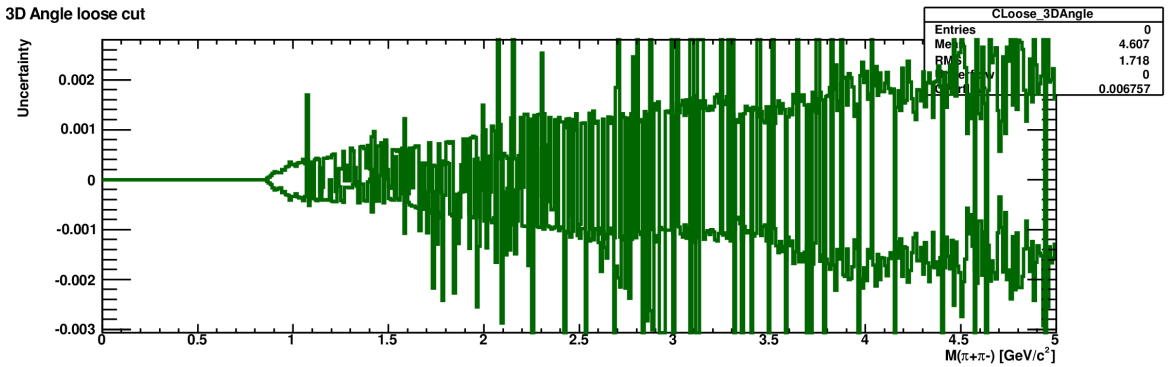
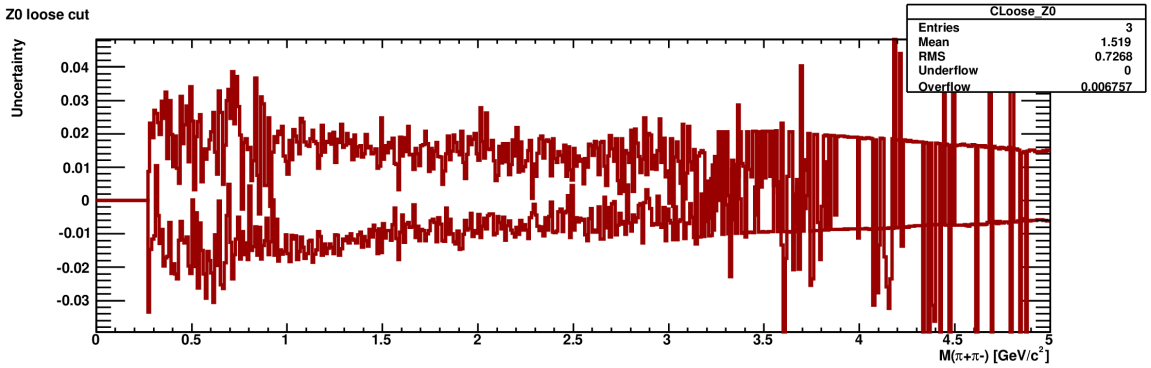
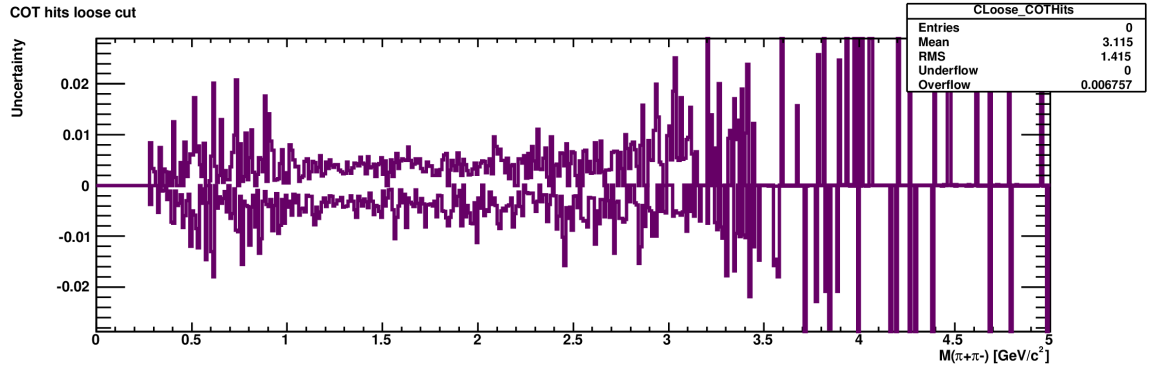


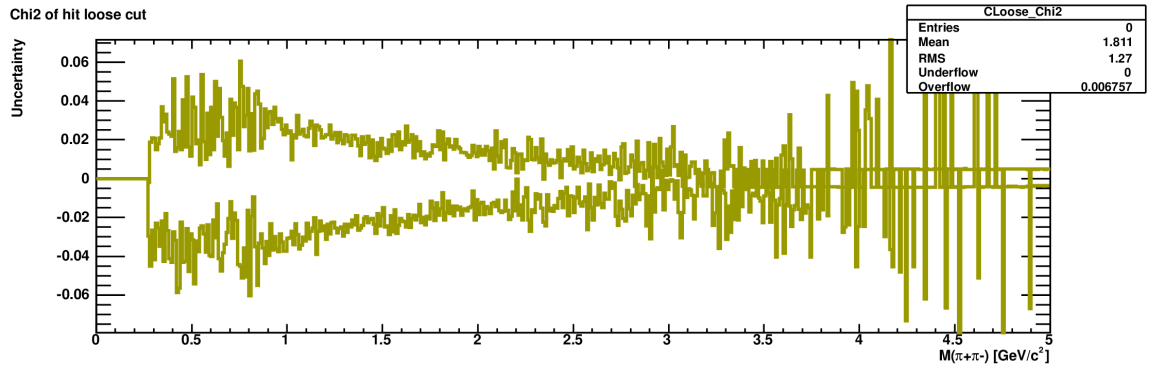
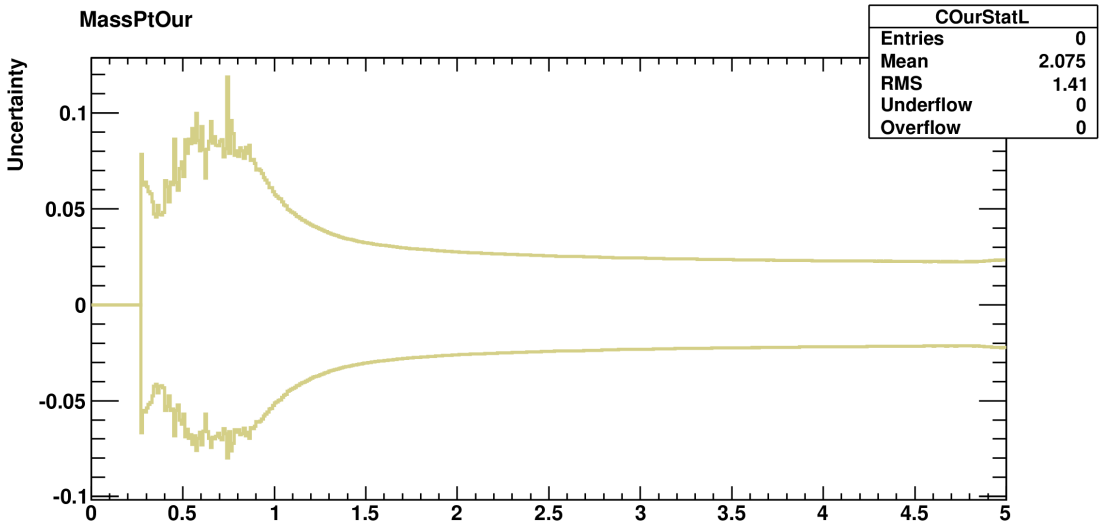




Systematics (4)







Systematics (5)