AuAu2010 (pp 2009) data QA

May, 2, 2012

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Data Cuts

AuAu 200 GeV Run 10 :

Inline triggers: 260 504
,260 514
,260 524

(vpd-mb + Tower E_T > 4.3 GeV)

|zVertex| < 30 cm
$|zV_{TPC} - zV_{VPD}|$ < 6 cm

RefMult > 266 (0-20 %)
118 < RefMult <= 266 (20-40%)

Had Frac Corr = 1.0 (0.5)
Run 11042049 excluded
Pile Up corrected
(global vs primary cut)

pp 200 GeV Run 9:

Inline triggers: 240 530 (Tower E_T > 6 GeV)
240 540 (Tower E_T > 4.3 GeV)
240 570 (2.6 < E_T < 4.3 GeV)

|zVertex| < 30 cm
$|zV_{TPC} - zV_{VPD}|$ < 6 cm

Had Frac Corr = 1.0

Trigger Definition

Offline trigger: Jet P_T = 8 – 20 GeV/c

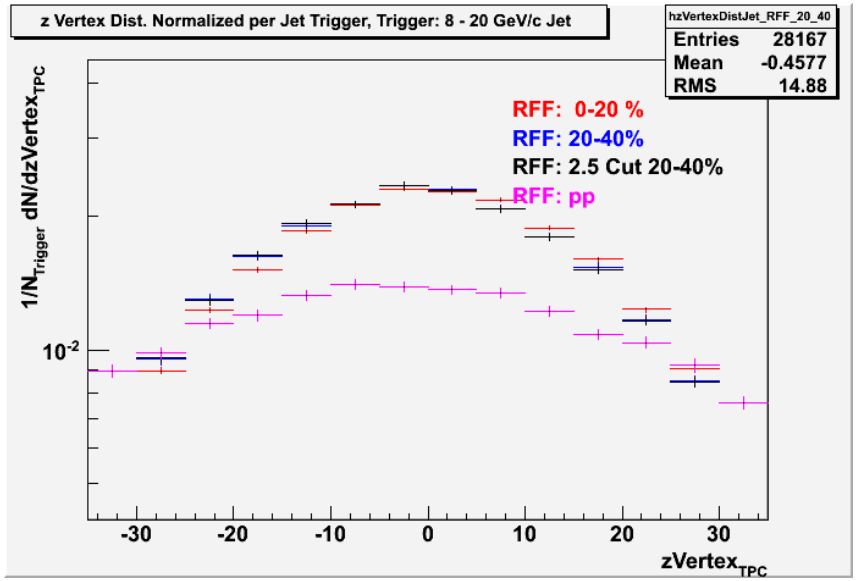
Jet must contain a tower of E_T > 5 GeV

JFA

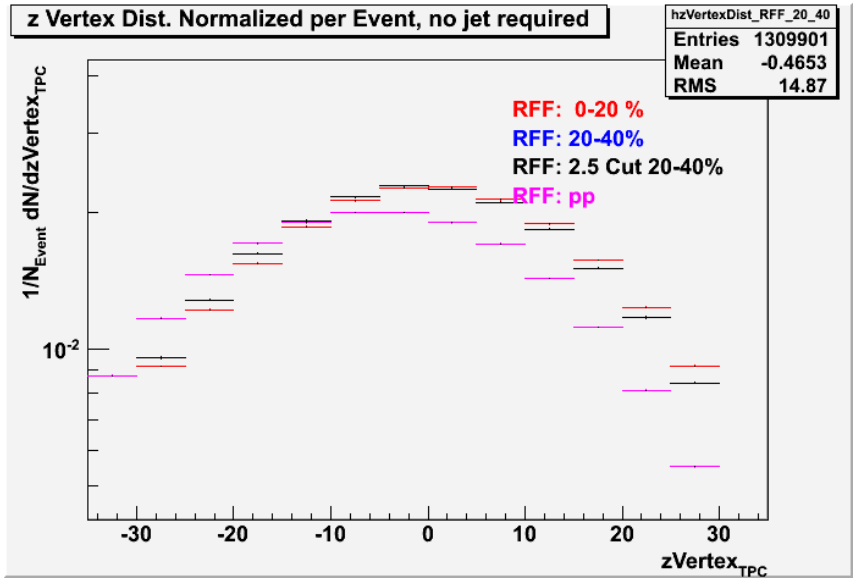
R = 0.4
Anti-Kt
P_T cut > 3.0 GeV (/c) on towers (tracks)

Accepted Events QA

A event is accepted if it passes the cuts and a Trigger jet (defined before) is found!



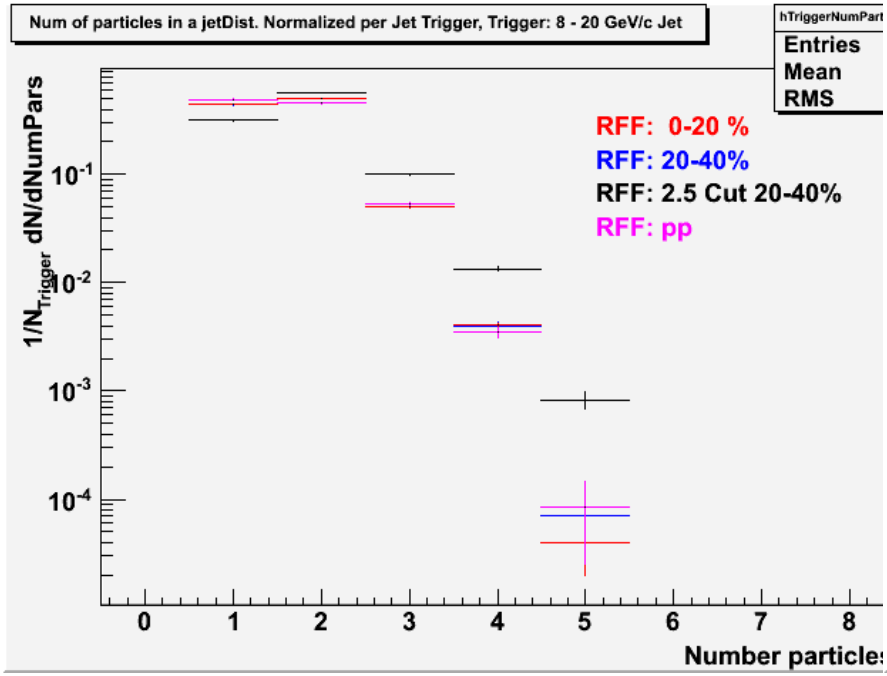
Per Trigger zVertex distribution

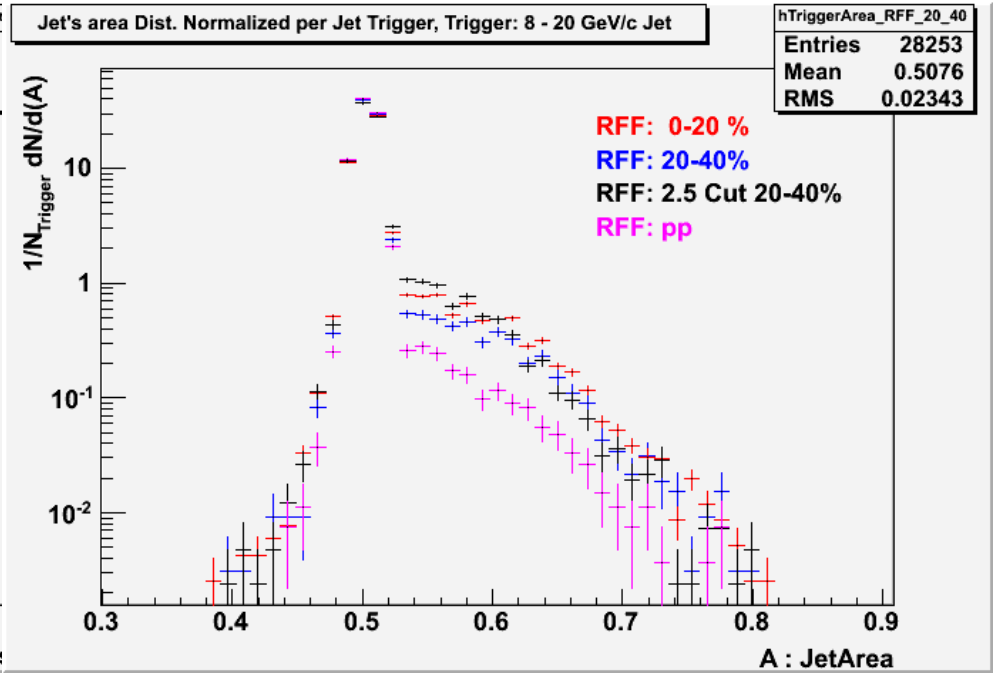


Per Event zVertex distribution

- pp zVertex distribution shifted to negative values.
- The jet-triggered events are less affected.

Accepted Events QA





Low pt cut - > more particles in jet

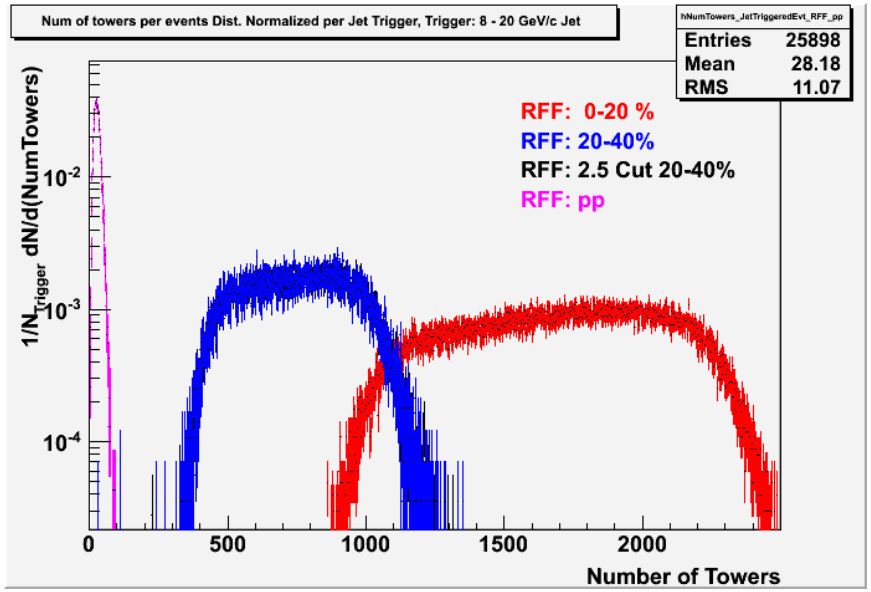
Similar number of particles distributions

Similar jet area distributions (except higher centrality -> higher +'ve fluctuations)

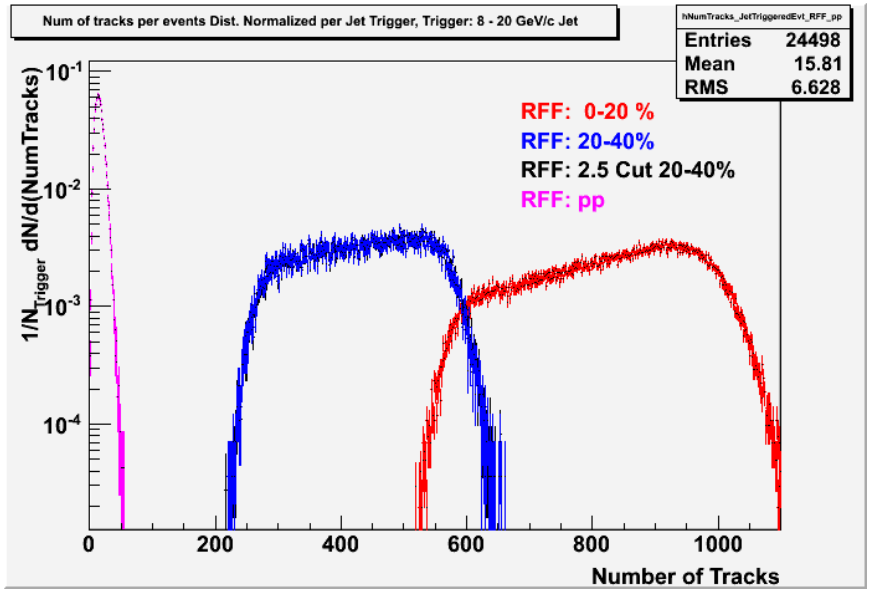
R = 0.4, area circle = 0.5026

Accepted Events QA

Towers, normalized by number of Jet triggers

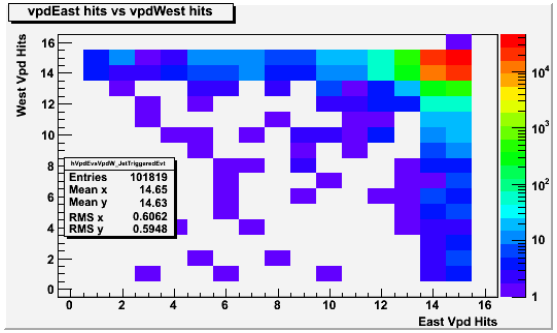


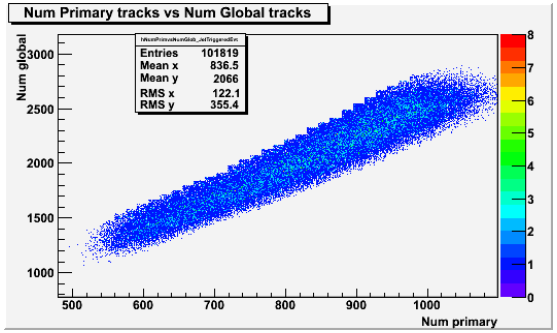
Tracks

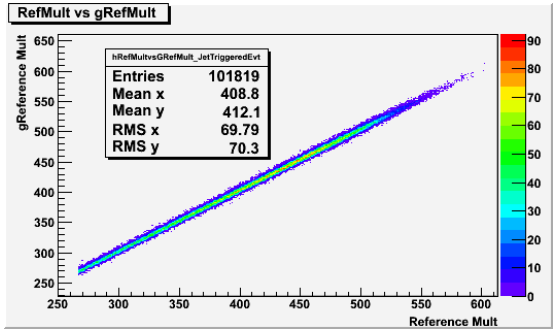


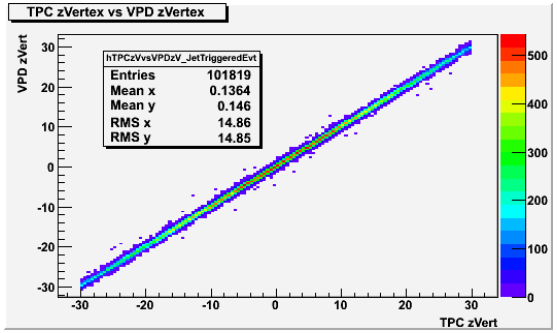
Jet Triggered central AuAu Events

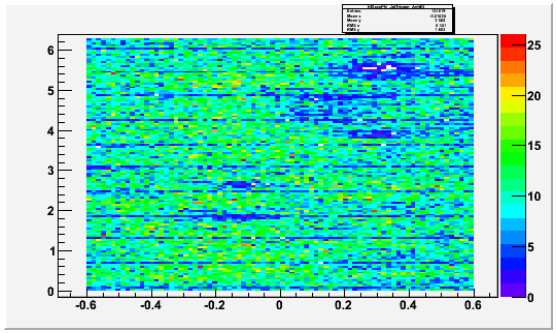
RefMult > 266 (0-20 %), RFF

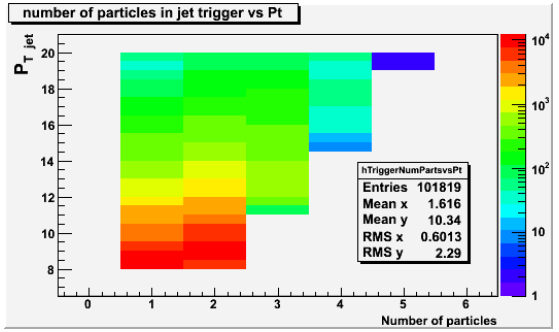


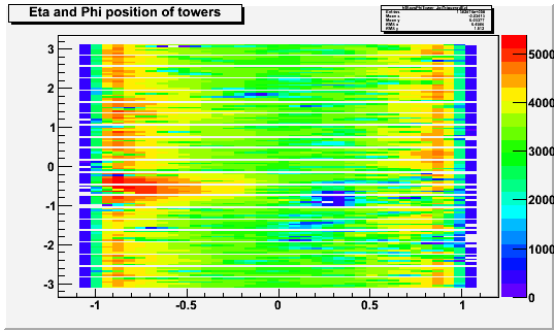


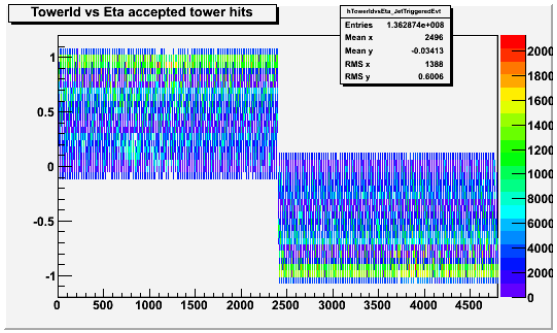


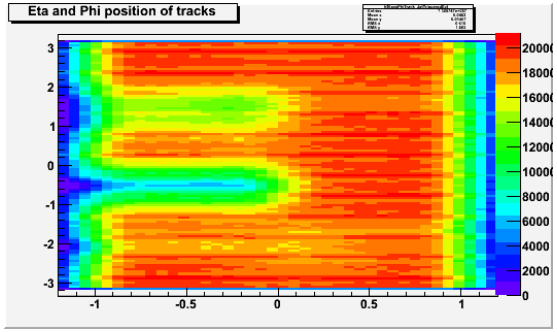






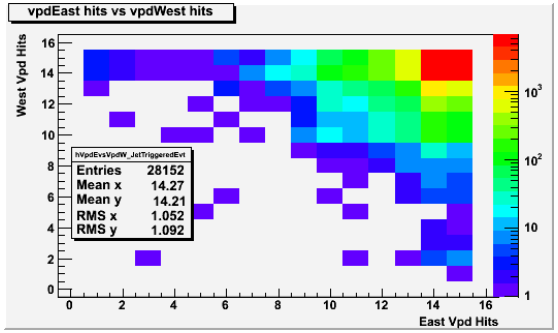


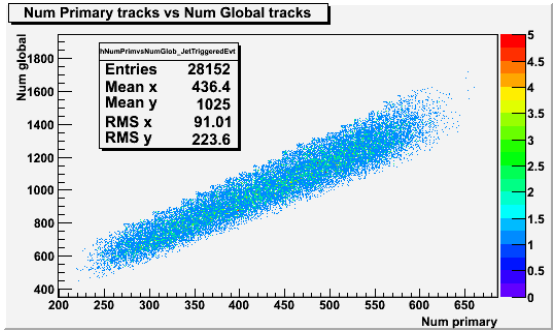


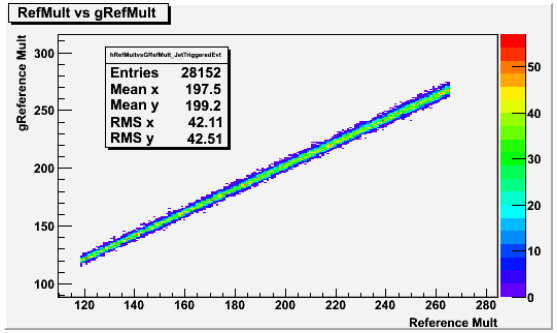


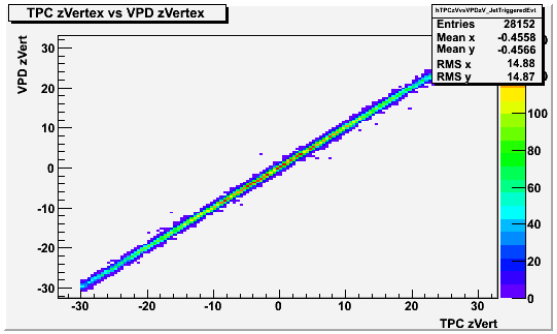
Jet Triggered central AuAu Events

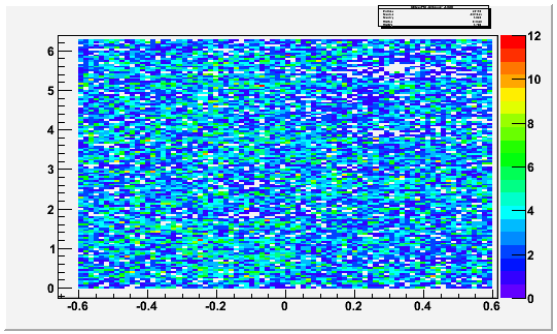
118 < RefMult <= 266 (20-40%), RFF

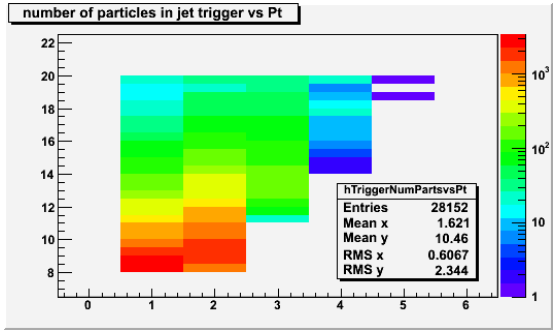


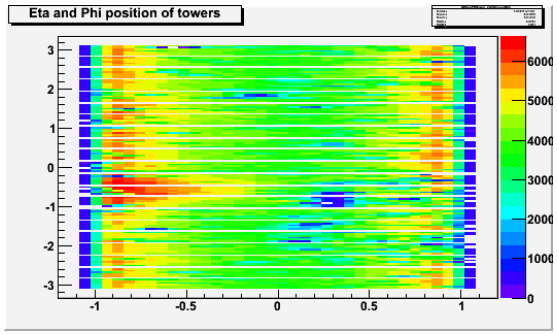


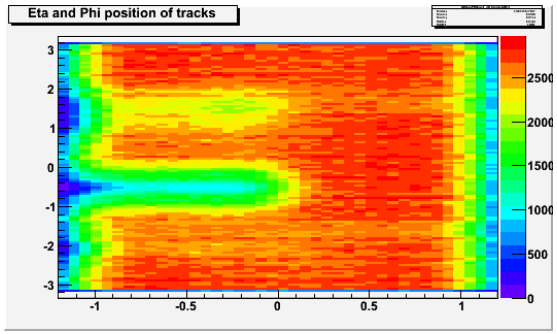






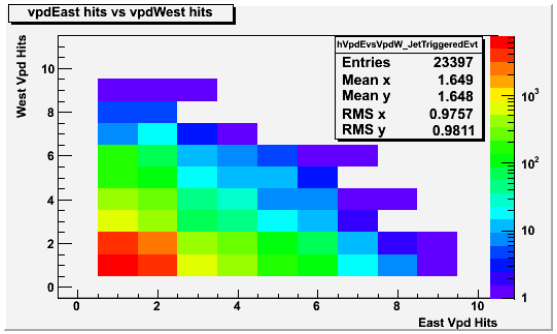


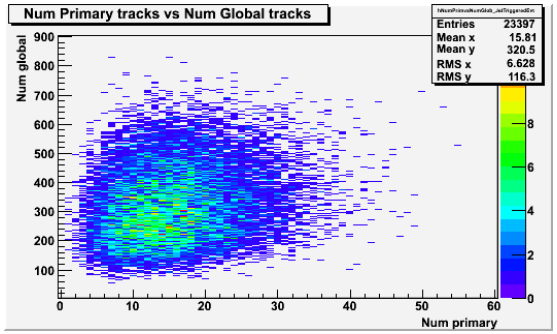


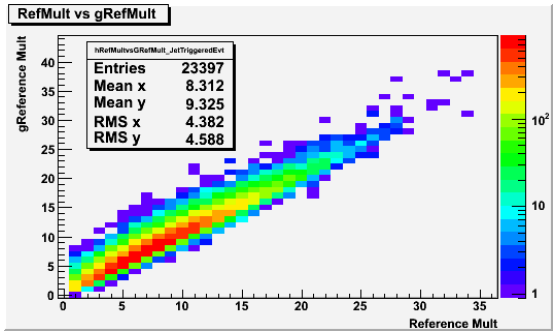


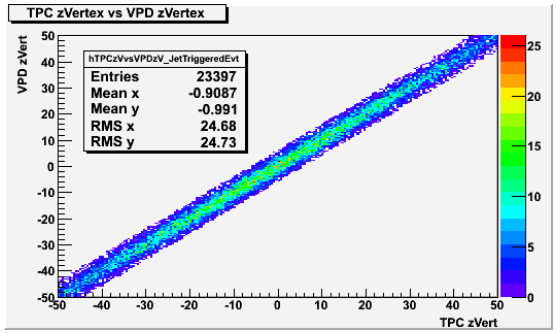
Jet Triggered pp Events

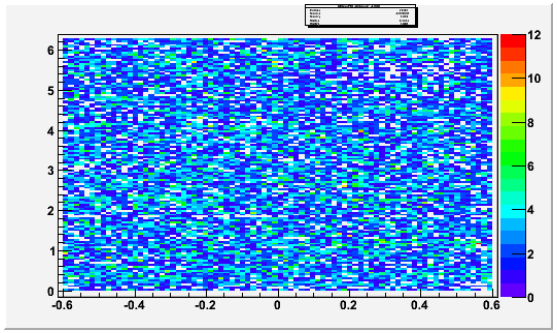
pp , RFF

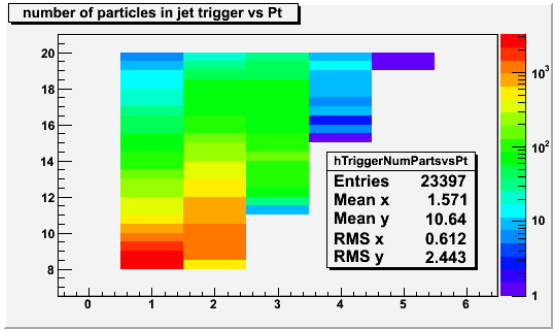


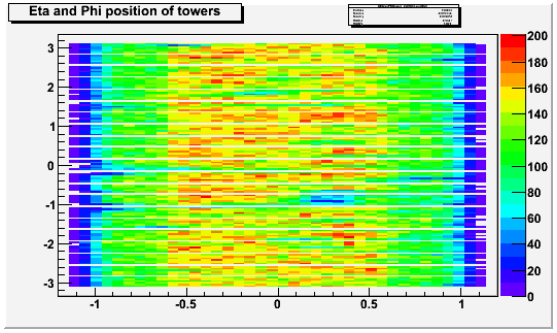


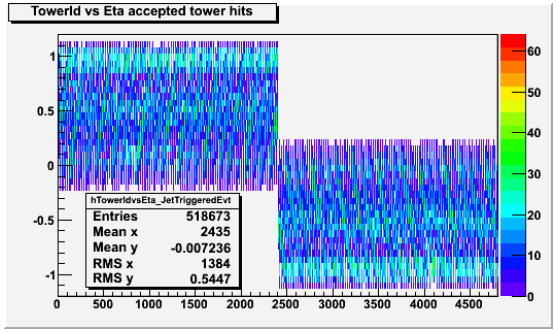


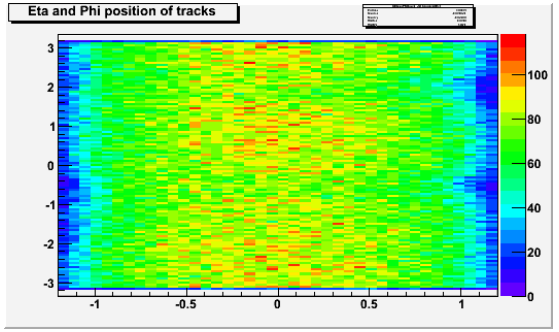








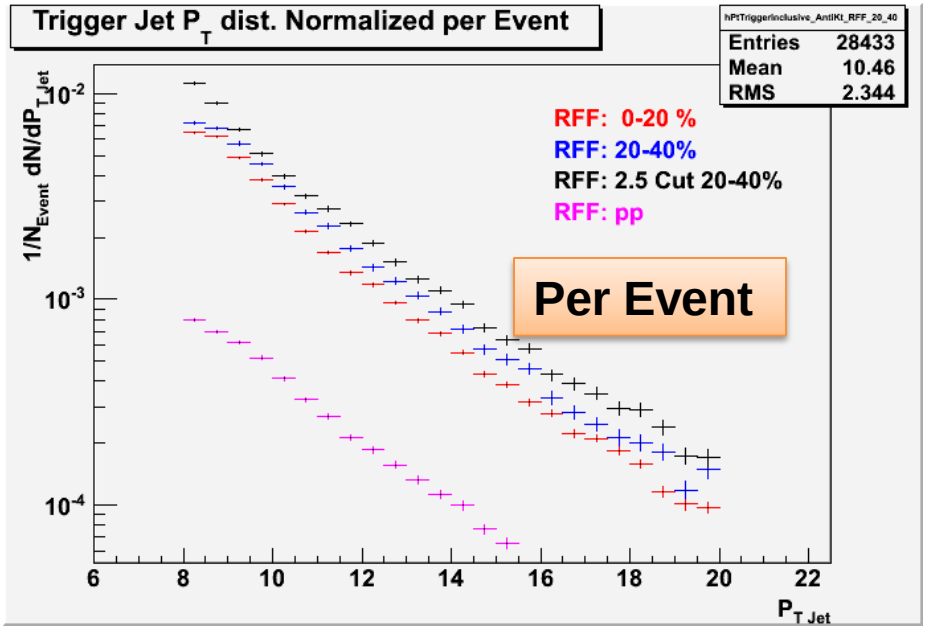


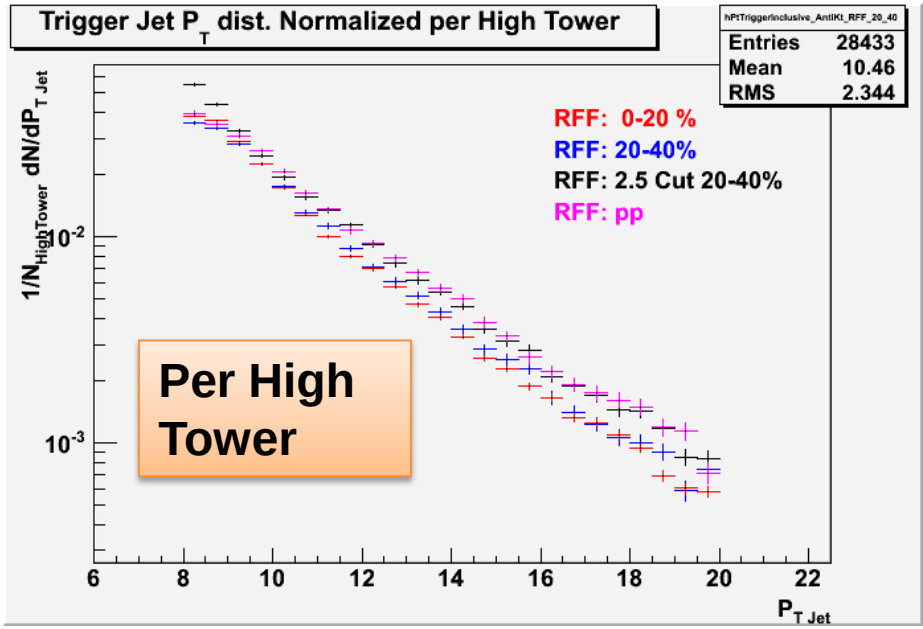


Jet Trigger Pt distributions

Offline trigger: Jet P_T = 8 – 20 GeV/c
Jet must contain a tower E_T > 5 GeV

R = 0.4
Anti-Kt
Pt_cut > 3.0 GeV (/c) on towers (tracks)



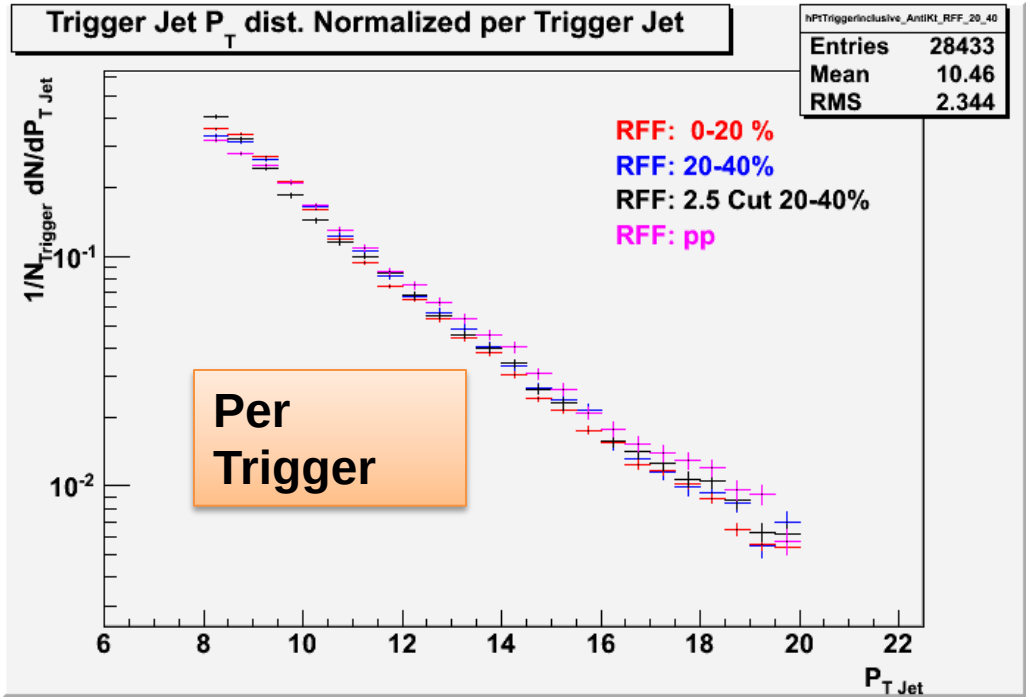


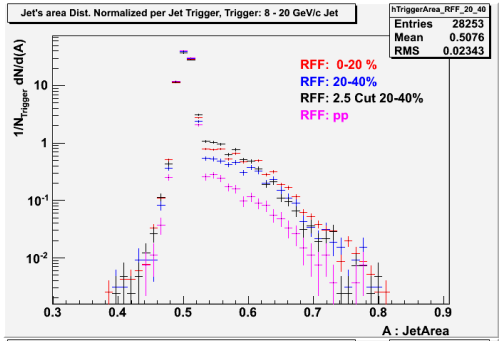
Low Pt cut -> more bias toward hard jets (5 + 2.5 < 8 required for my jet cut)
Peripheral > Central: more high towers per event in peripheral (slide 14)
Is it a surface bias (of the collision)? or another trigger efficiency that I am not thinking about?

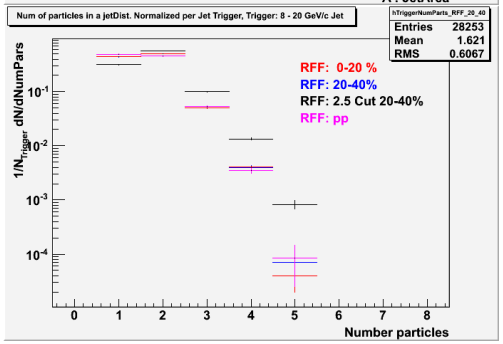
Jet Trigger Pt distributions

Offline trigger: 8 – 20 GeV/c Jet.
Jet must contain a tower of at least 5 GeV

R = 0.4
Anti-Kt
Pt_cut > 3.0 GeV (/c) on towers (tracks)







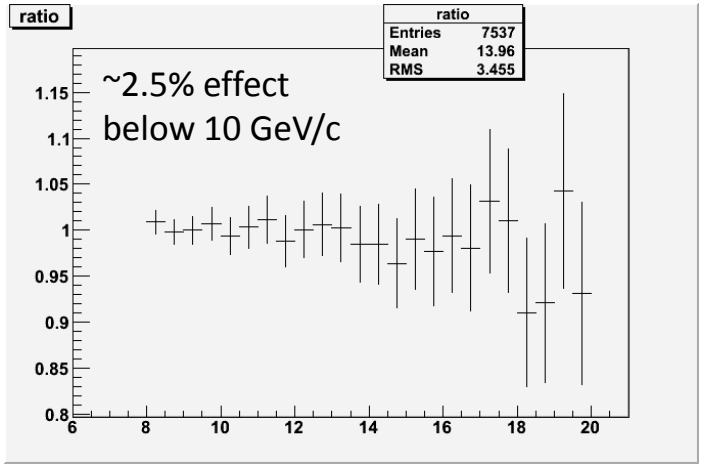
Better agreement if normalized to 1 (ratios at slide 13)
This is the shape I have to focus on since my ratios are calculated as “per jet trigger”

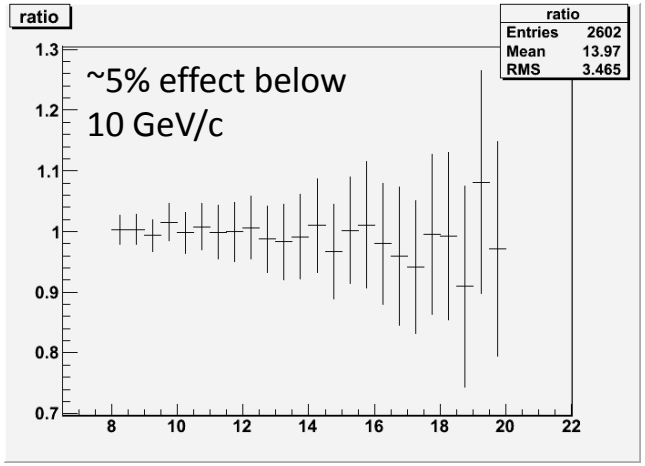
Hadronic correction fraction and B field effect

20% most central

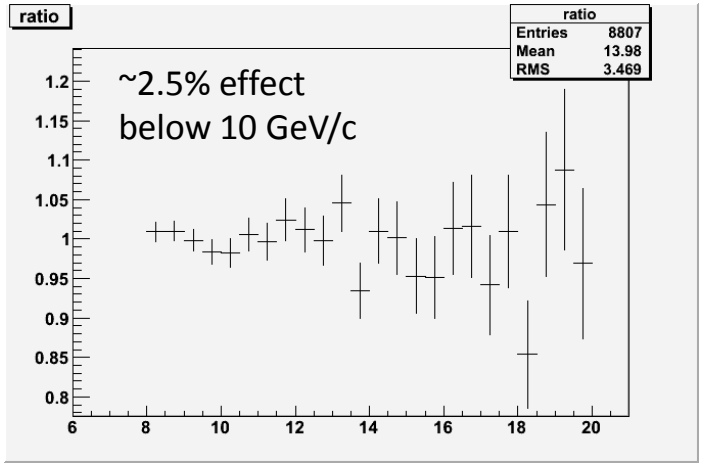
20 – 40 % most central

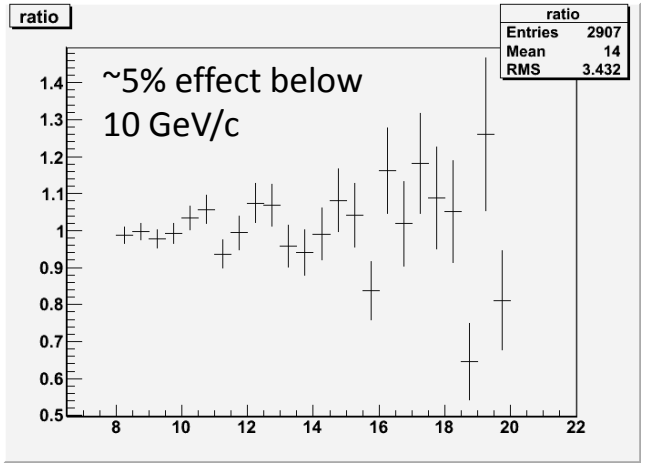
HadCorr = 1.0 /
HadCorr = 0.5





FF / RFF





Jet Trigger Pt distributions

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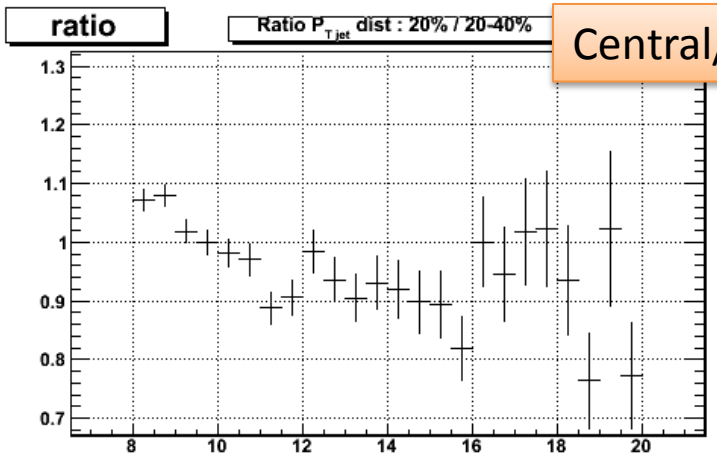
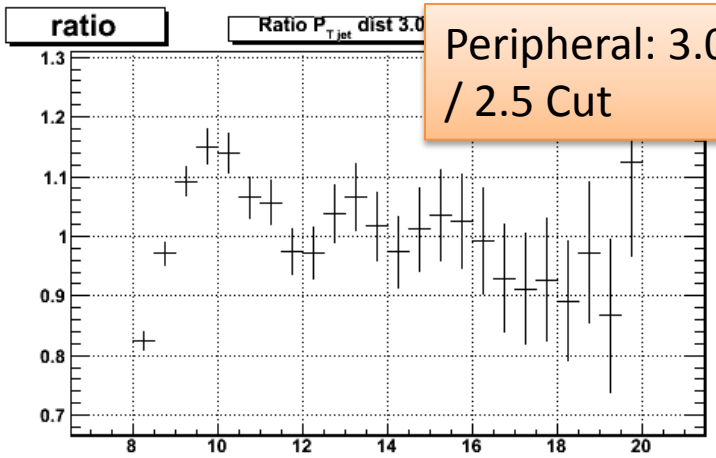
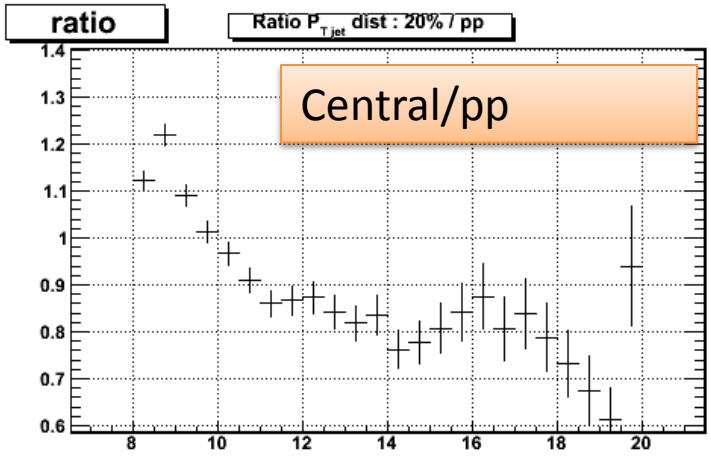


Central/Peripheral



Peripheral: 3.0 Cut / 2.5 Cut

~10 % difference < 10 GeV/c

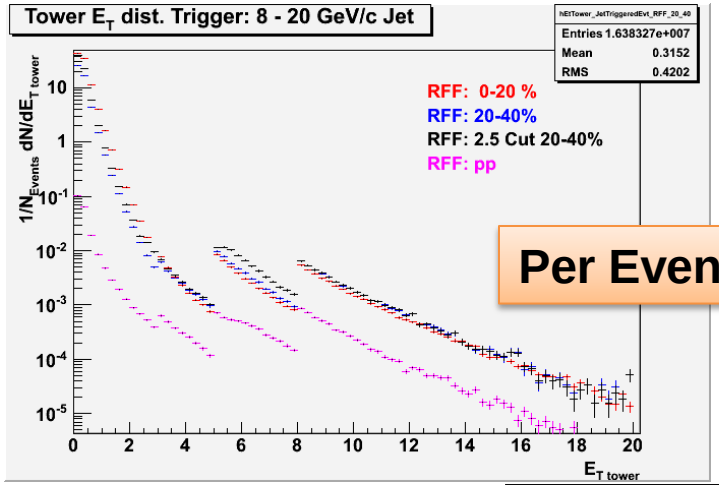


Central/pp

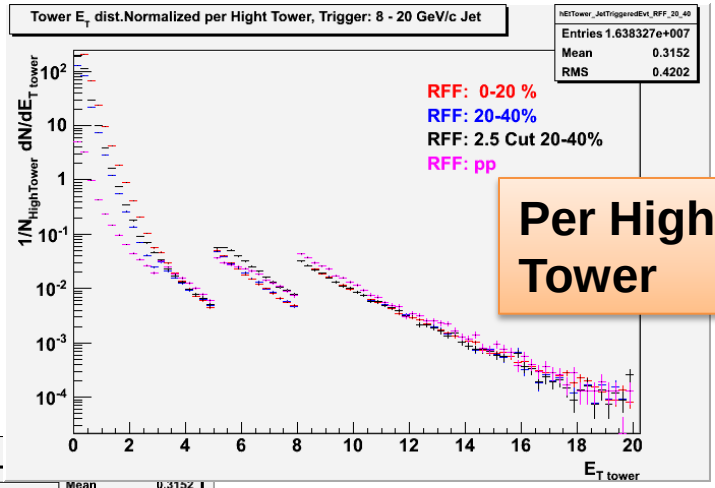
~20-10 % difference < 10 GeV/c

How does the jet trigger bias the event track and tower distributions?

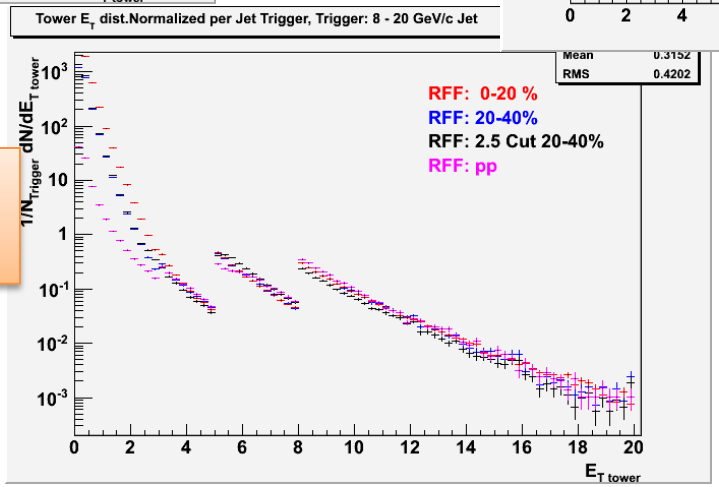
Jet triggered events' tower distributions (E_T)



Per Event



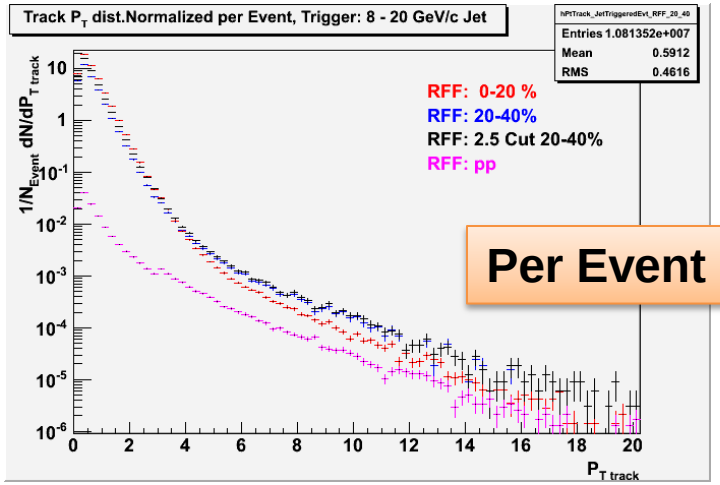
Per High Tower



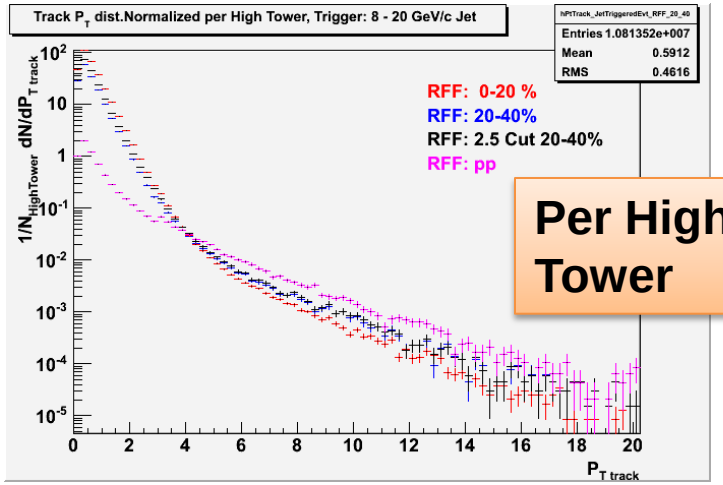
Per Trigger

How does the jet trigger bias the event track and tower distributions?

Jet triggered events' track distributions (P_T)

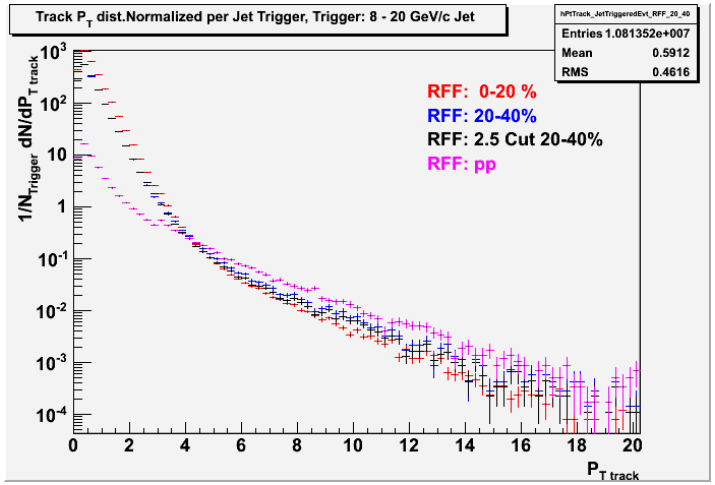


Per Event



Per High Tower

Per Trigger



No trigger effect evident at $P_T < 3.0$ GeV/c (Good, expected)

Conclusions

Unexplained shift on z Vertex distribution in pp

Jet's area and Jet's number of particles distributions are similar in central and peripheral AuAu, not in pp (except at tail)

AuAu data: Higher multiplicity at large eta in tower hits, even after I applied my Hot towers removal…

Peripheral AuAu has higher per event high P_T jets. Collision surface bias or detector trigger efficiency effect?

hadronic corrections of high tower choice -> 2.5 – 5 % change in jet P_T spectra.

FF vs RFF -> 2.5 – 10 % change in jet P_T spectra

Peripheral vs central trigger jet P_T spectra: 10-20% difference

pp vs central trigger jet P_T spectra: 20-40% difference

Tracks P_T dist looks free of trigger bias blow 3.0 GeV/c