

# **New Physics Results from the FTPC**

**Joern Putschke  
for the STAR FTPC group**



STAR Analysis Meeting  
June 5-7, 2003



**FTPC calibration finished :-)**

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**Thanks to all  
who helped us !**

Special thanks to  
Jerome, Lidia and Jeff



June 2003

Joern Putschke / STAR Analysis Meeting

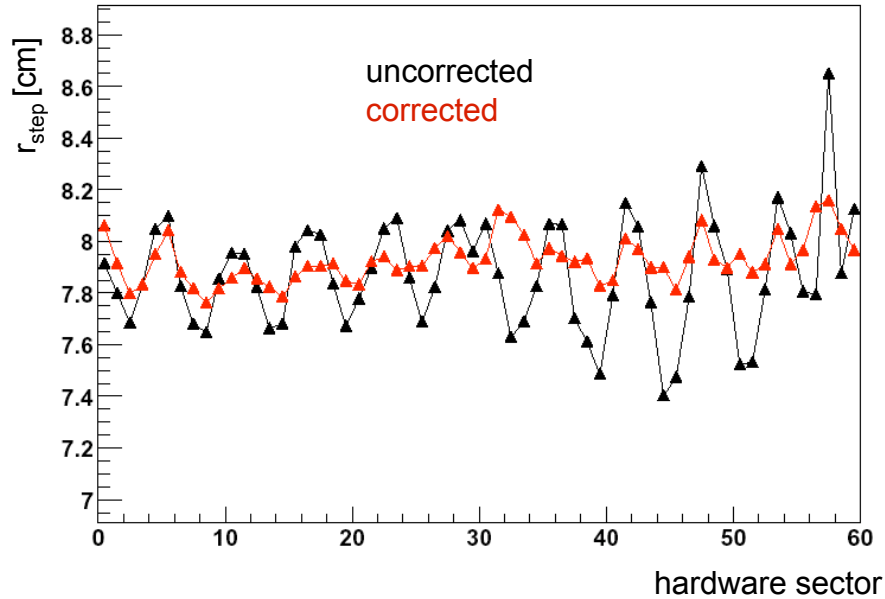
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# Outline

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- **AuAu calibration quality**
- **Flow news  $v_1$  (Aihong)**
- **AuAu minbias spectra**
  - $\langle pt \rangle$  vs. centrality
  - multiplicity FTPC/TPC
- **Forward / backward  $\langle pt \rangle$  correlation**
- **dAu centrality definition**
- **dAu spectra**
- **Outlook & toDo**
  - analysis plans
  - dAu / pp calibration status

# AuAu calibration quality

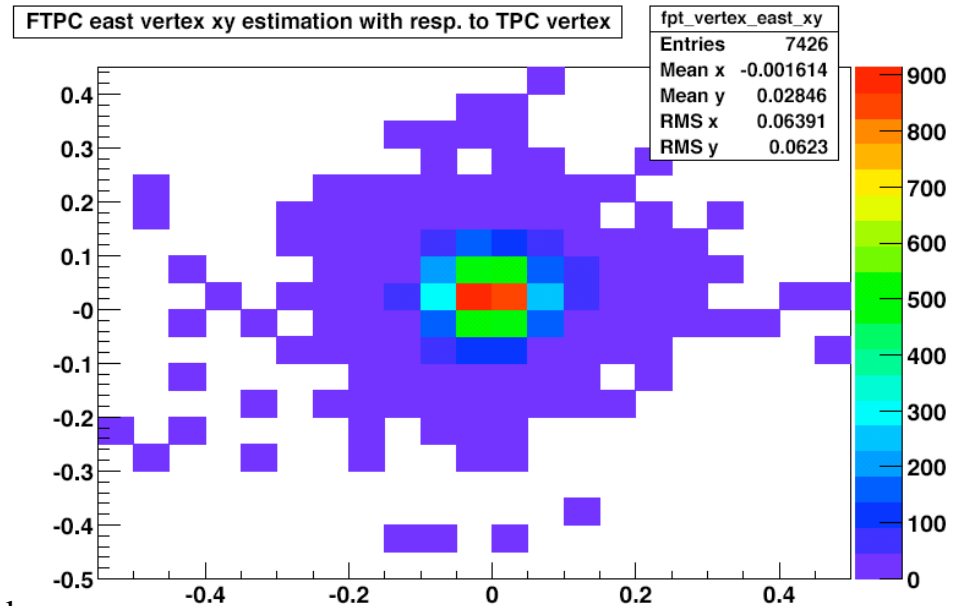


Inner cathode shift correction applied and works with reasonable precision.

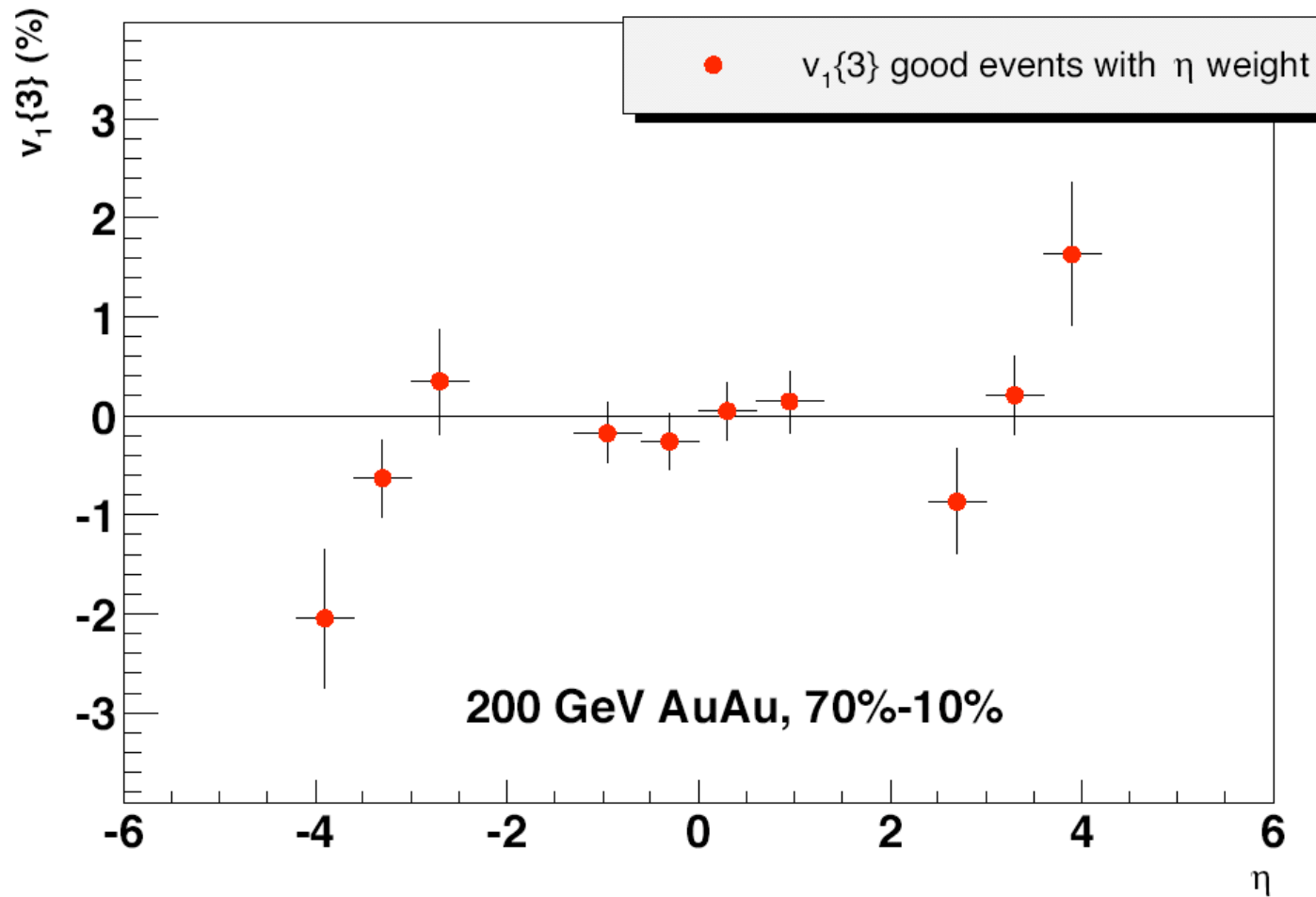
For more details on calibration look at (under construction) :  
[http://wwwstar.mppmu.mpg.de/ftpc\\_calibration\\_page/index.html](http://wwwstar.mppmu.mpg.de/ftpc_calibration_page/index.html)

Vertex reconstruction with FTPC tracks with respect to TPC vertex :

$x, y \pm 200 \mu\text{m}$   
 $z \pm 0.5 \text{ cm}$



# Flow news ( $v_1$ )



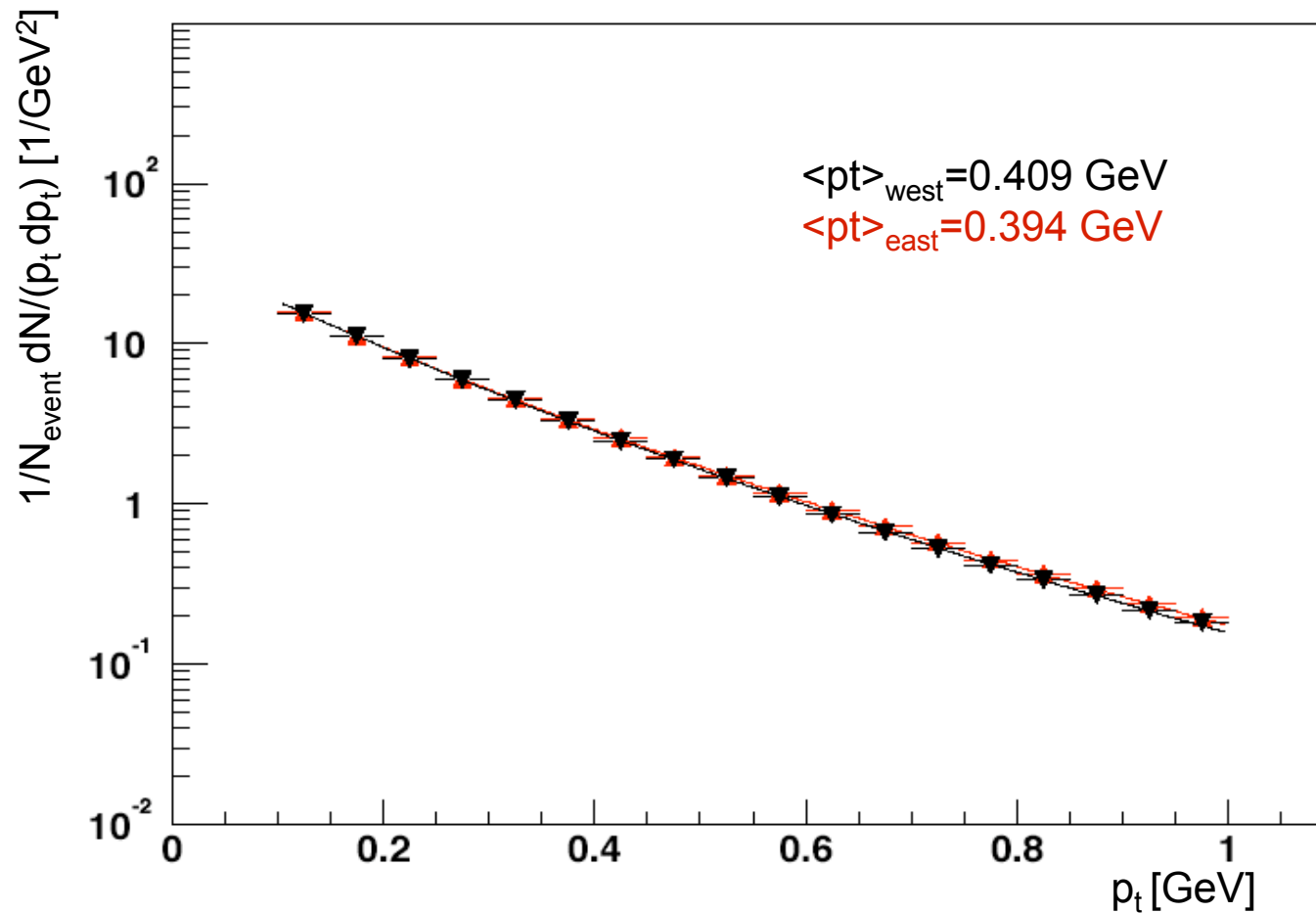
$v_1$  signal improved with final calibrated FTPC AuAu minbias dataset !

$v_2$  on the way ...

**Flow with FTPCs looks very promising !**

(Aihong Tang)

# AuAu minbias $p_t$ distribution

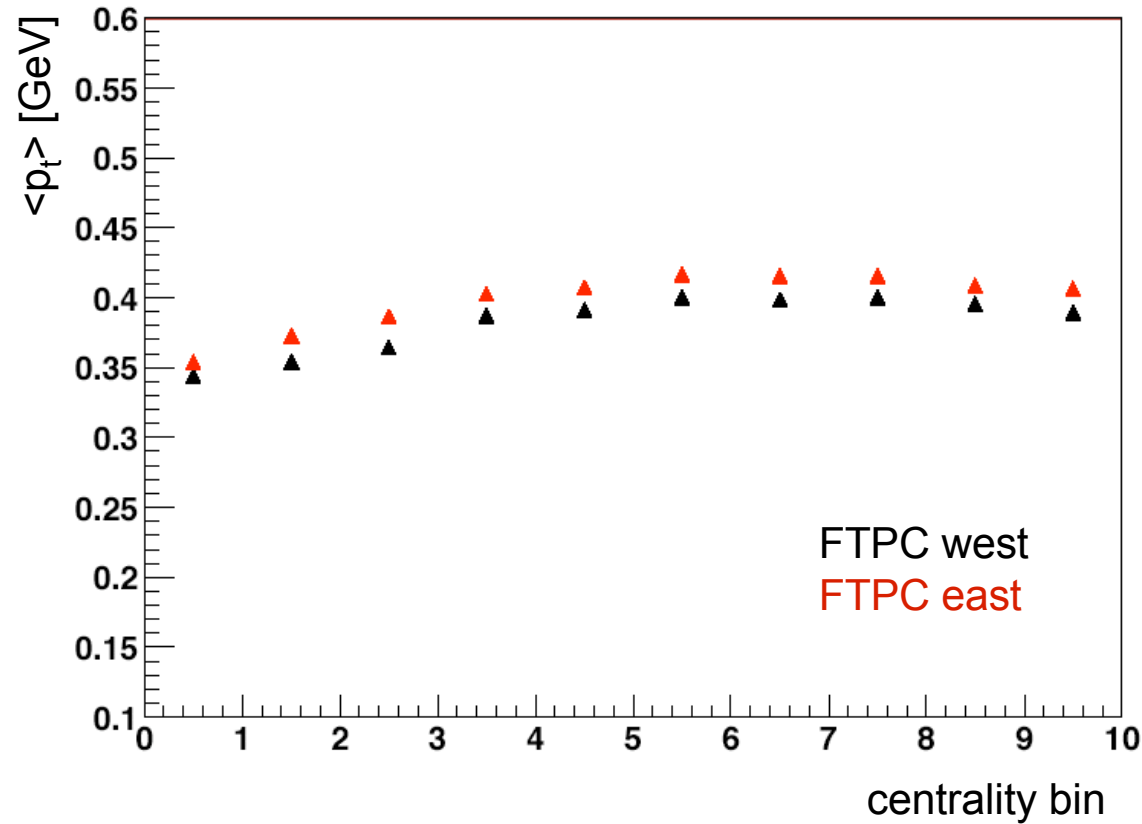


AuAu minbias  
68k (47K)

no corrections

dca < 2cm  
0.1 ≤  $p_t$  < 1  
3 ≤  $y_{\text{pion}}$  < 3.2  
 $n_{\text{hits}} \geq 5$   
 $|\text{vertex}_z| \leq 25$

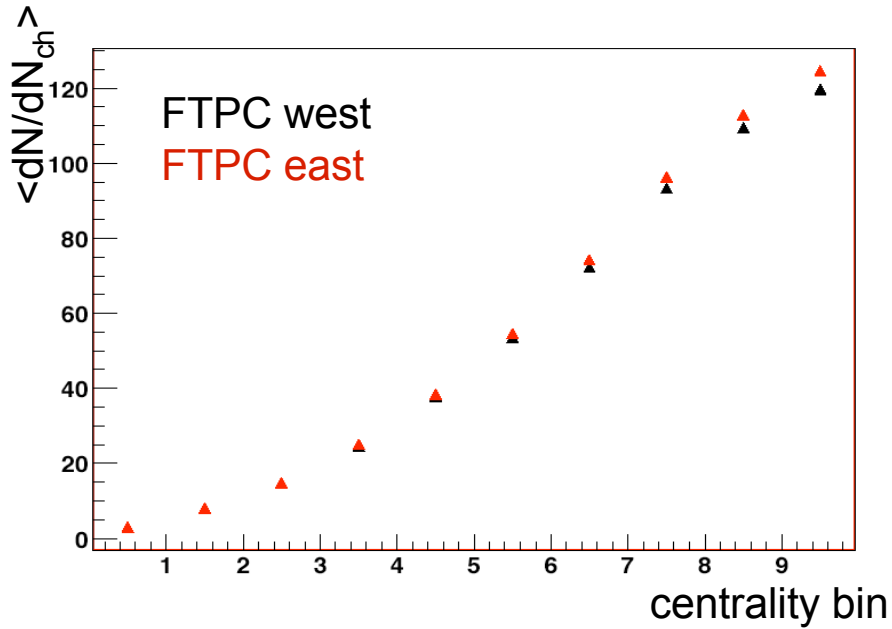
# $\langle p_t \rangle$ vs. centrality



Only slight centrality dependence of  $\langle p_t \rangle$  for charged hadrons visible in the FTPCs.

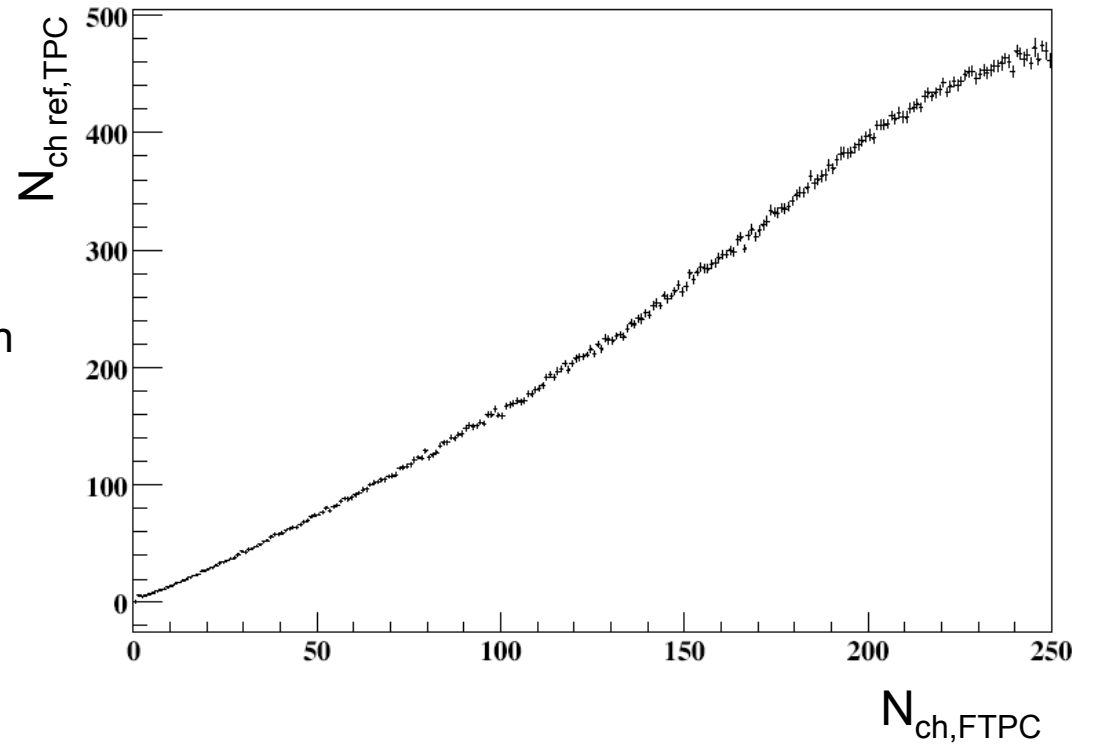
Same behaviour as for pions in the TPC.

# Multiplicity FTPC/TPC



dca < 2cm  
0.1 ≤ pt < 1  
2.9 ≤ eta < 3.5  
n\_hits ≥ 5  
|vertex\_z| ≤ 25

dummy

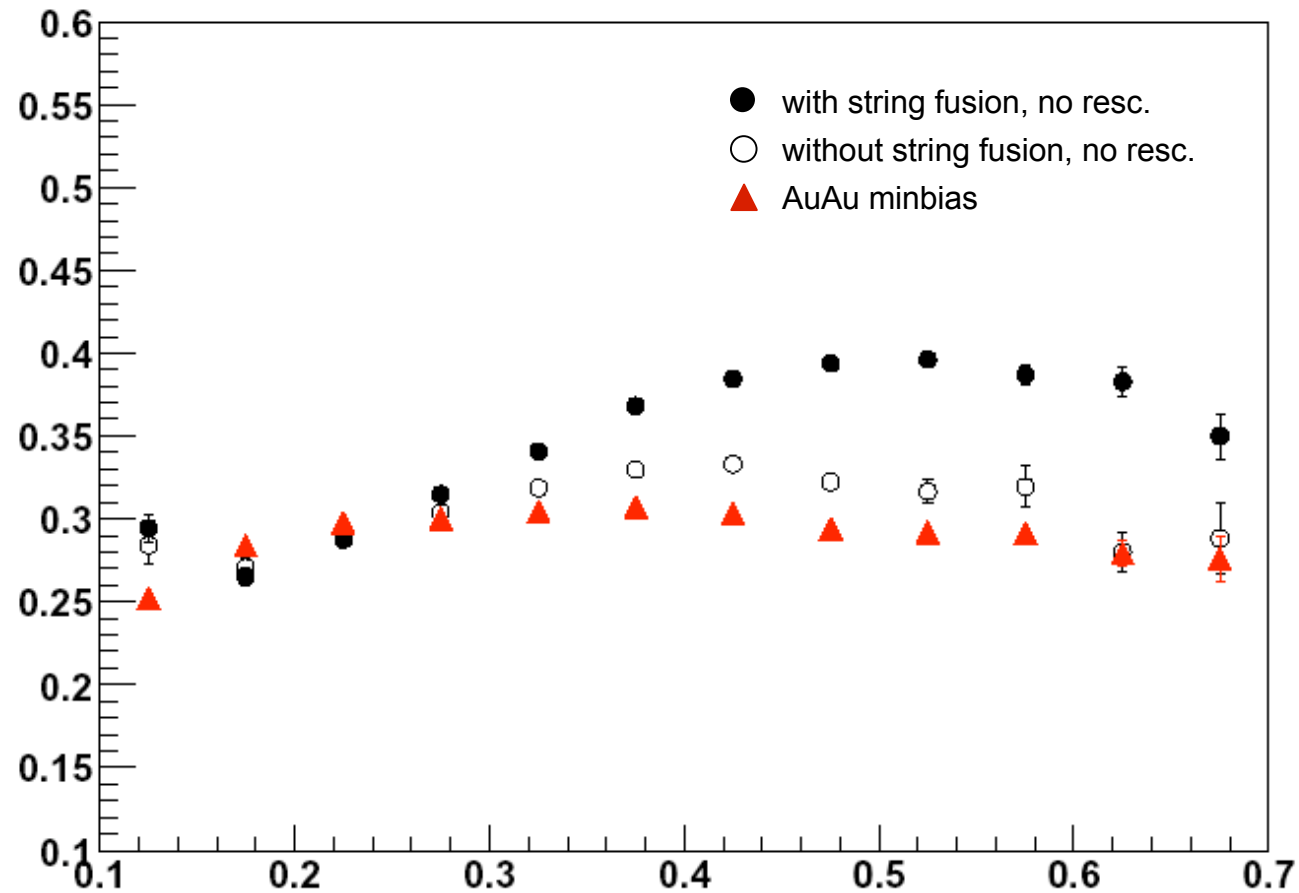




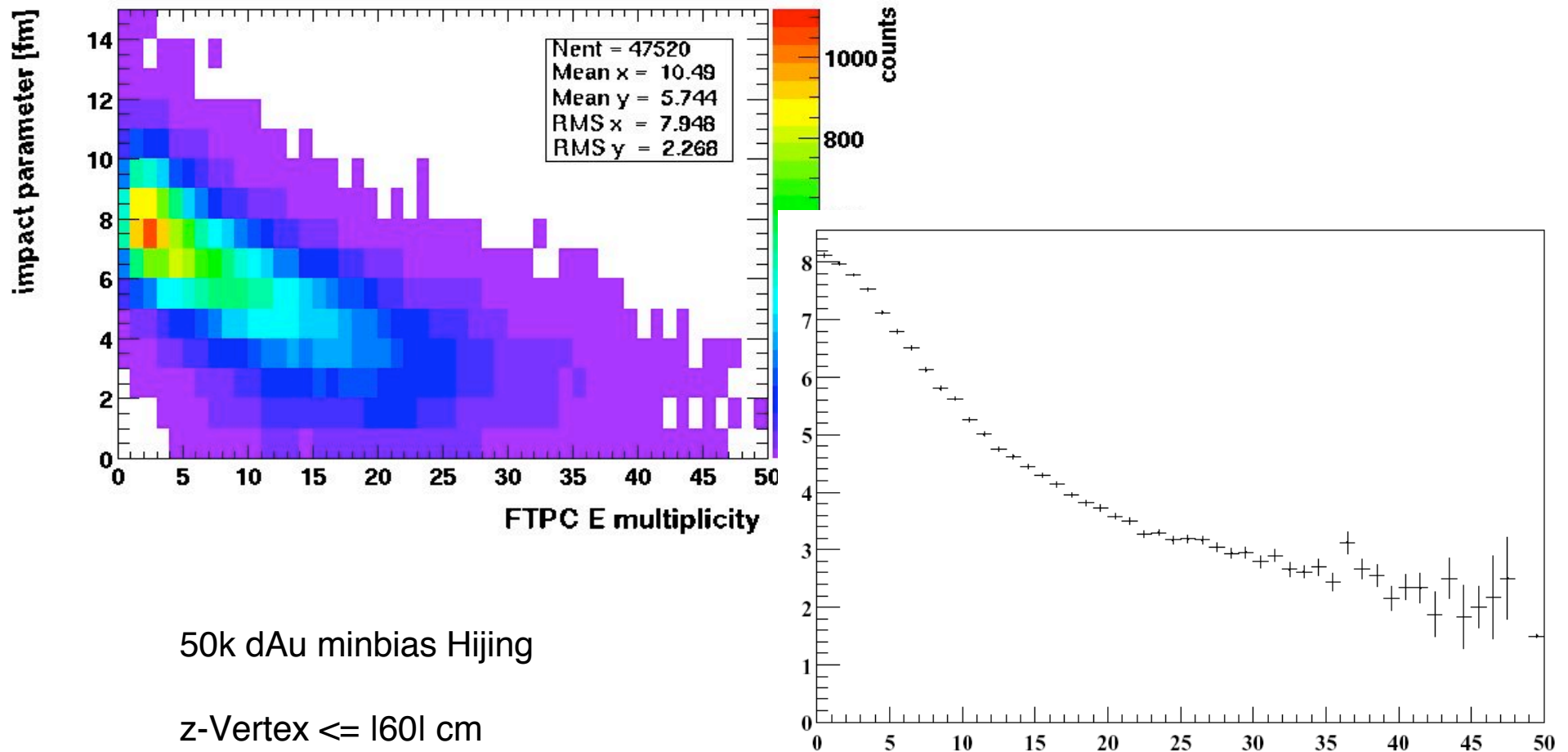
# String fusion modell

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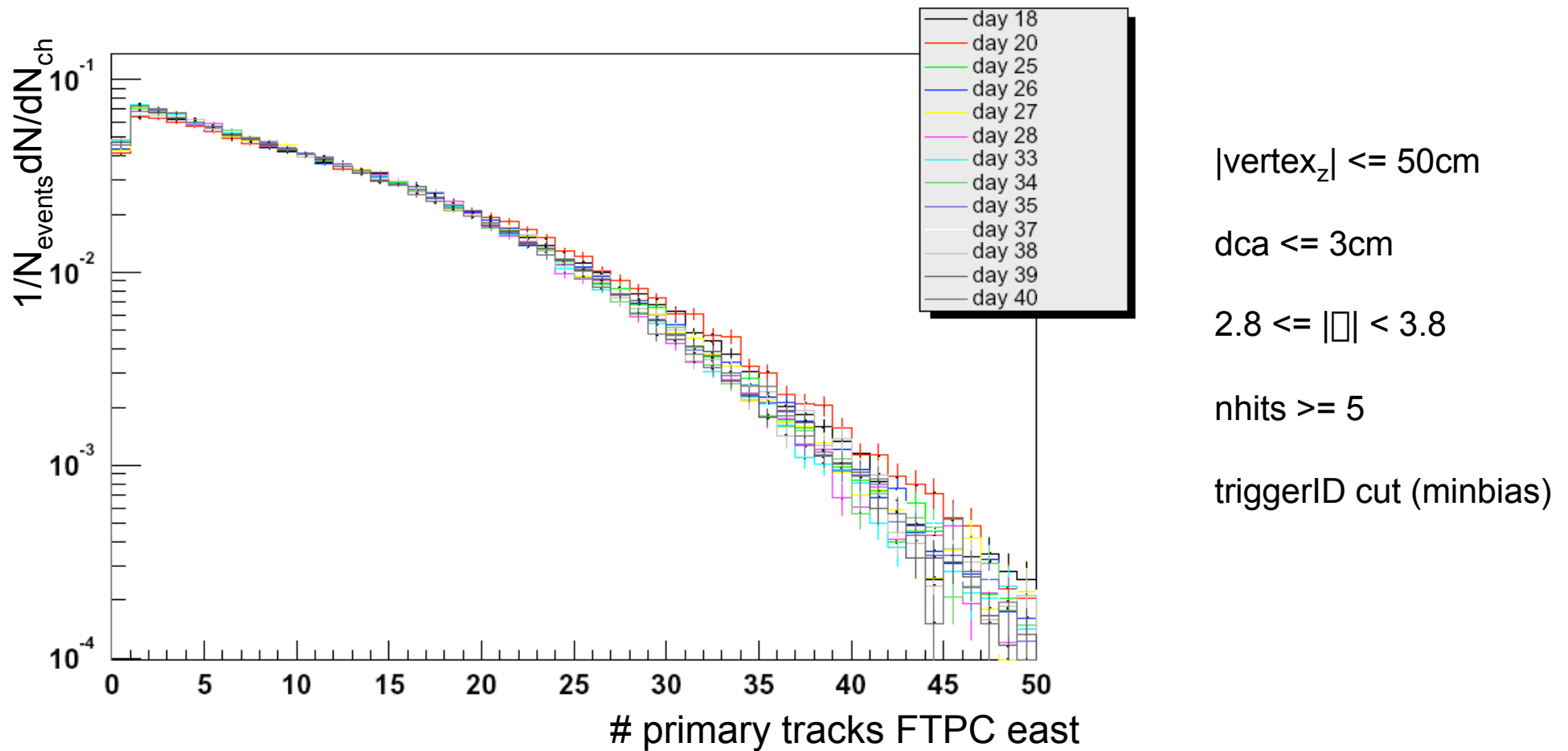
# Forward / backward $\langle pt \rangle$ correlation



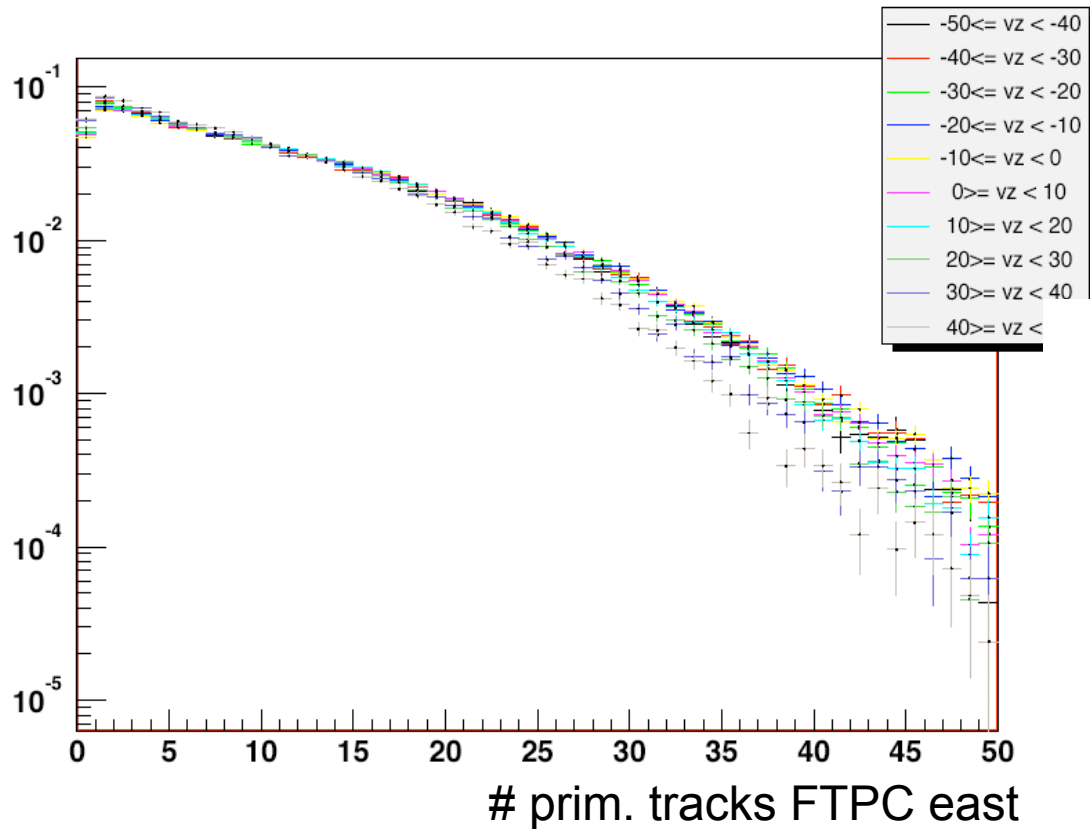
# Impact parameter vs. multiplicity FTPC east



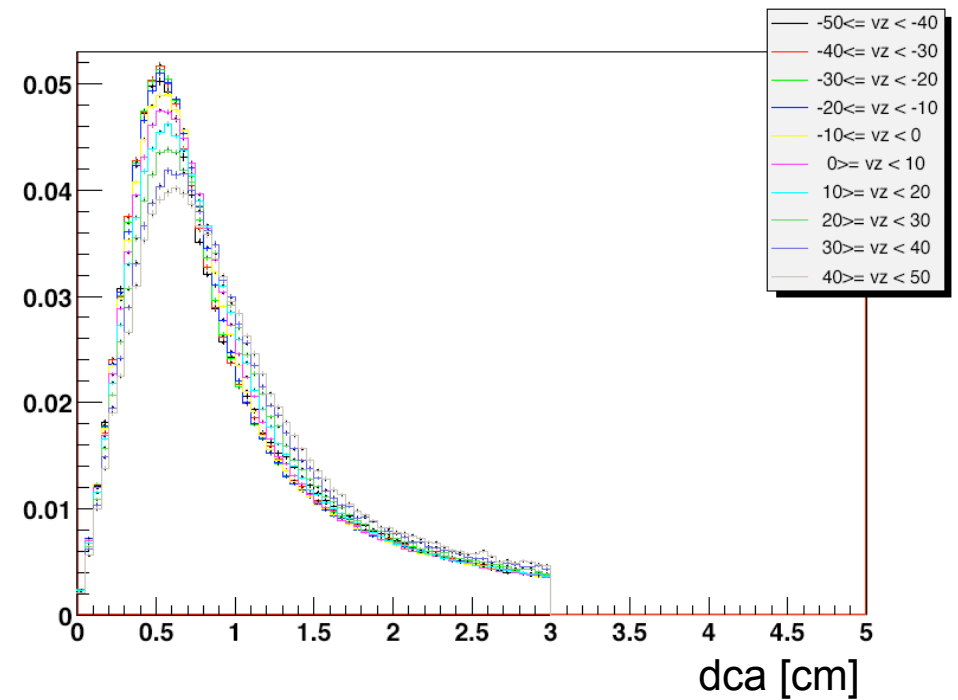
# dAu Multiplicity FTPC east



# Multiplicity FTPC east vs. vertex-z

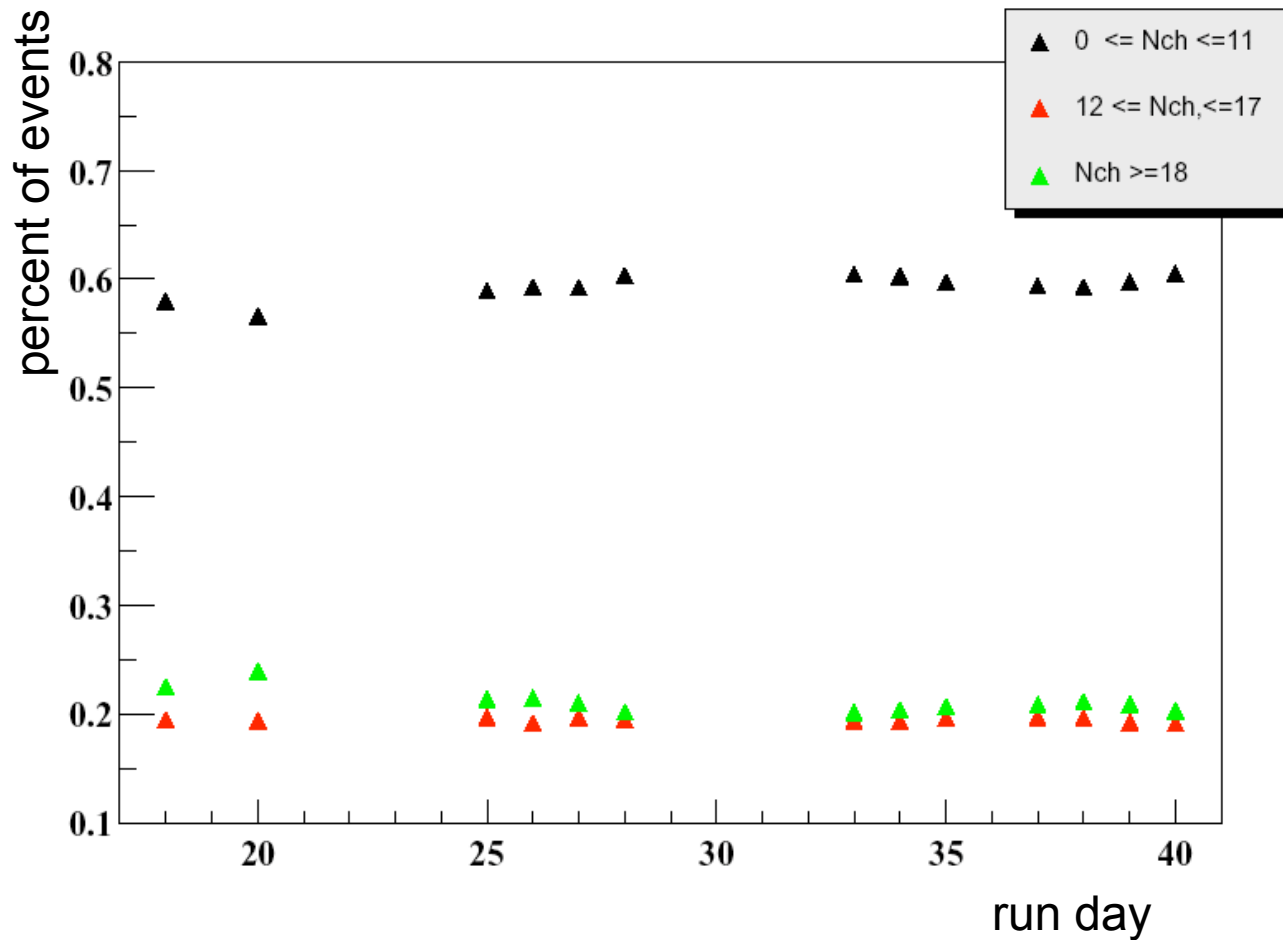


Slight Vertex-z dependence of FTPC east multiplicity for  $v_z > 30$  cm could be explained due to  $\langle dca \rangle$  shift and used dca cut  $< 3$  cm to minimize background and fake tracks.



$\langle dca \rangle$  shift due to missalignment of FTPCs (not calibrated yet) !

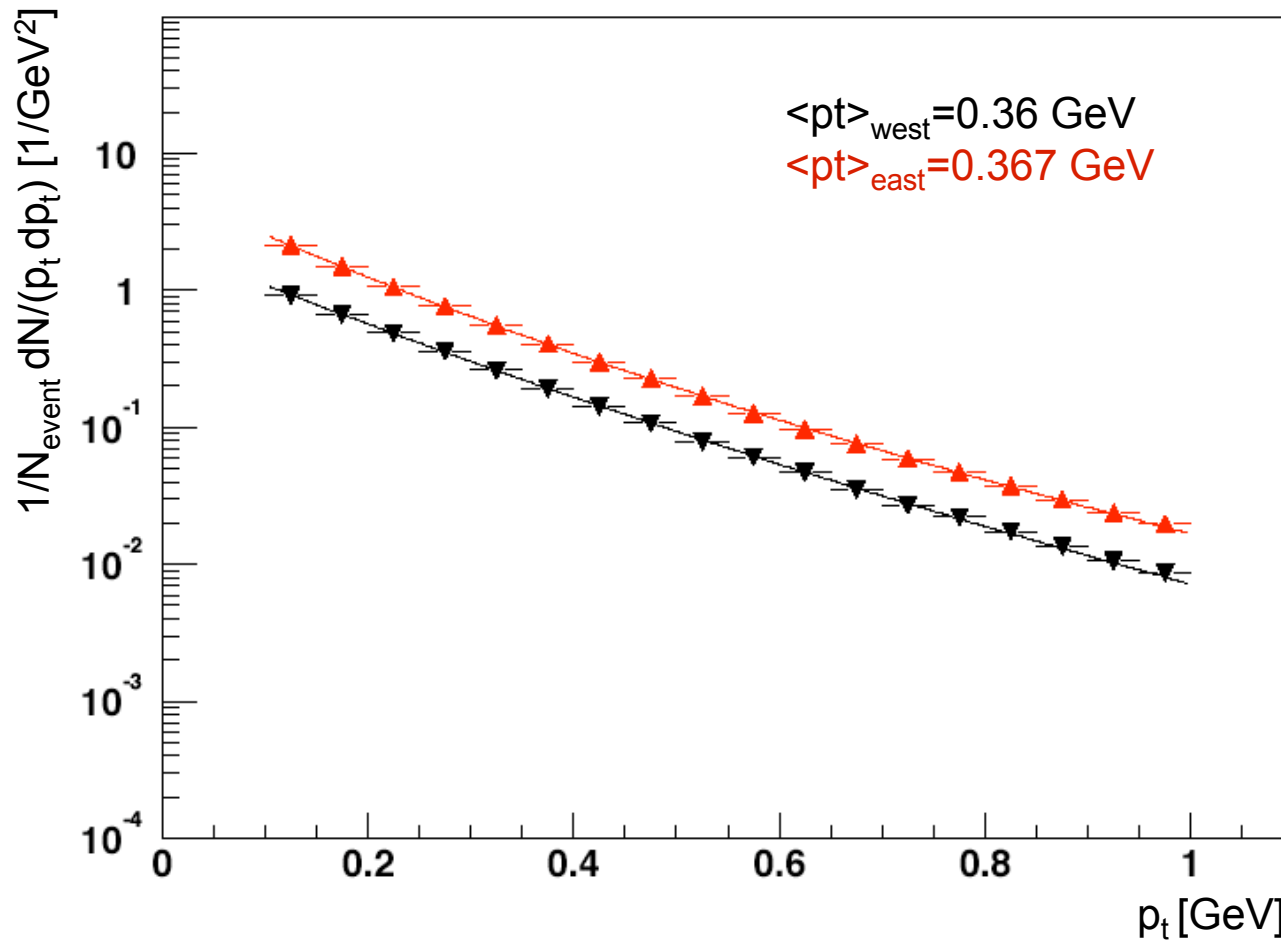
# Centrality FTPC east



$|\text{vertex}_z| \leq 50\text{cm}$   
 $\text{dca} \leq 3\text{cm}$   
 $2.8 \leq |\eta| < 3.8$   
 $\text{nhits} \geq 5$   
 triggerID cut (minbias)

$n_{ch}$ (east)	% of events
$\leq 11$	40-100
12-17	20-40
$\geq 18$	0-20

# dAu $p_t$ distribution

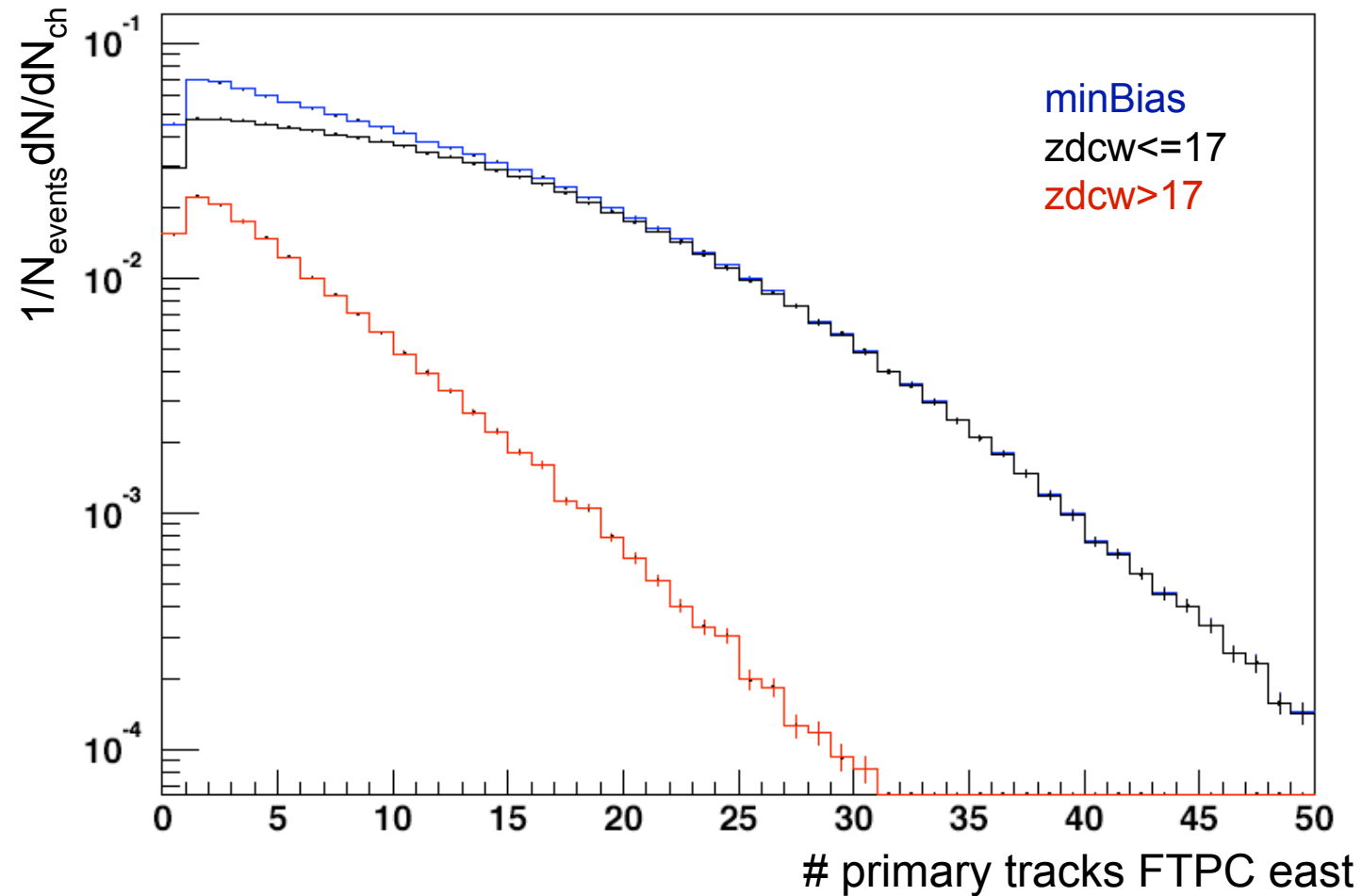


dAu minbias  
1.2 M (370K)

no corrections

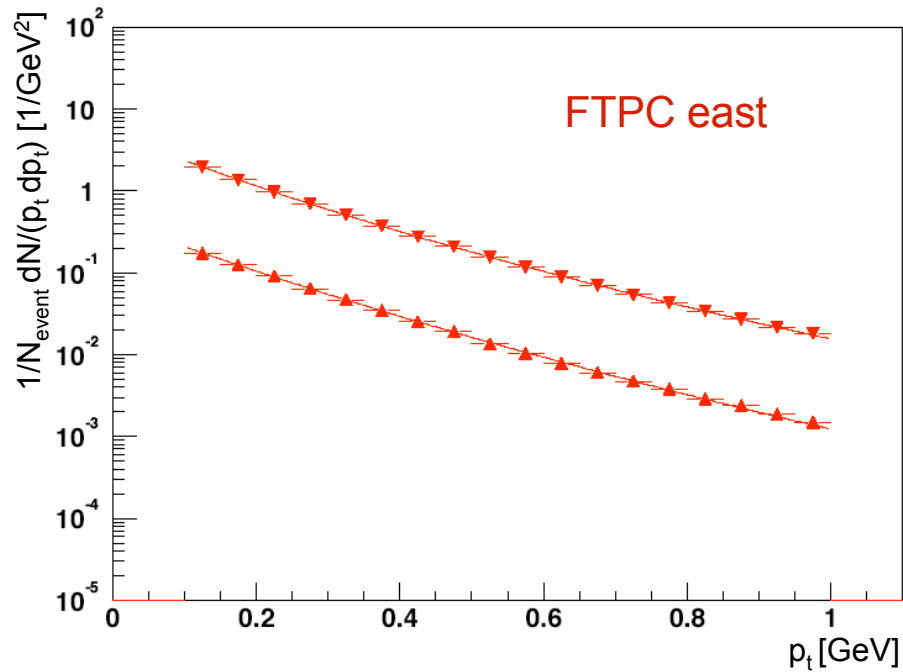
dca < 2cm  
0.1 ≤ p<sub>t</sub> < 1  
3 ≤ y<sub>pion</sub> < 3.2  
n\_hits ≥ 5  
|vertex\_z| ≤ 25

# FTPC east multiplicity neutron tag

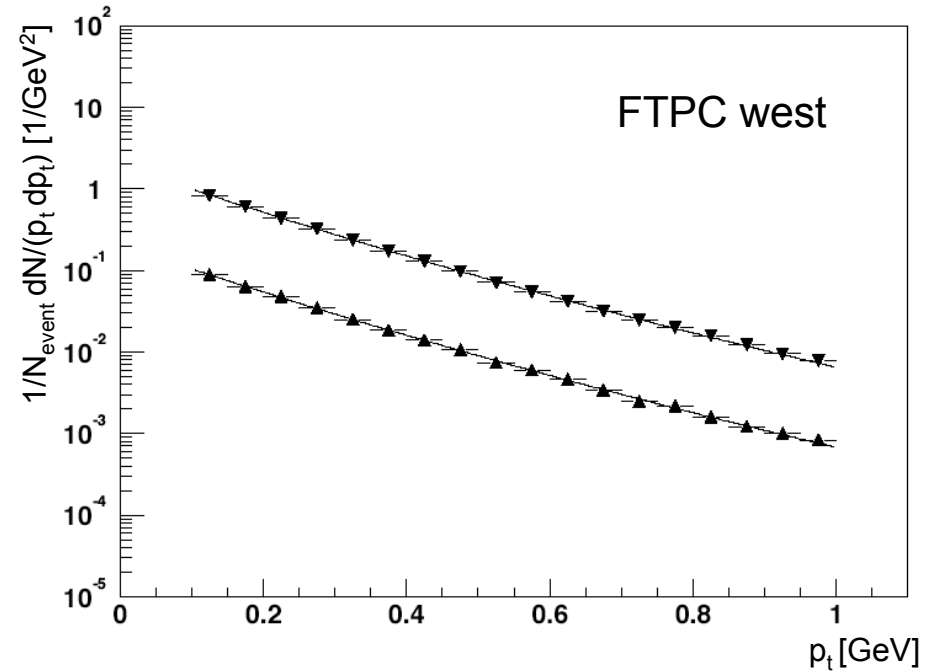




# dAu $p_t$ distribution neutron tag



$$\langle pt \rangle_{zdcw>17} = 0.352 \text{ GeV}$$
$$\langle pt \rangle_{zdcw\leq 17} = 0.369 \text{ GeV}$$



$$\langle pt \rangle_{zdcw>17} = 0.359 \text{ GeV}$$
$$\langle pt \rangle_{zdcw\leq 17} = 0.360 \text{ GeV}$$

dummy

# Outlook & toDo

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- **Analysis plans**
  - AuAu minbias spectra, flow ...

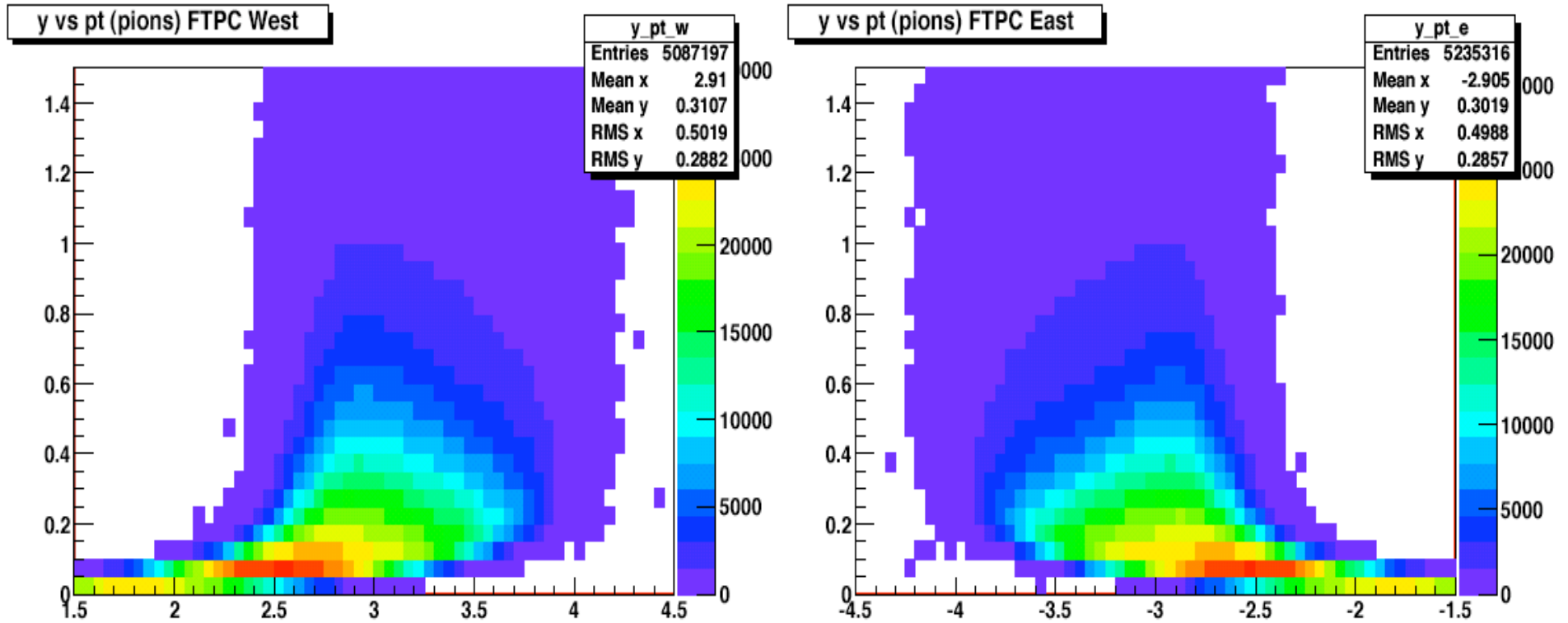
# The STAR FTPC group

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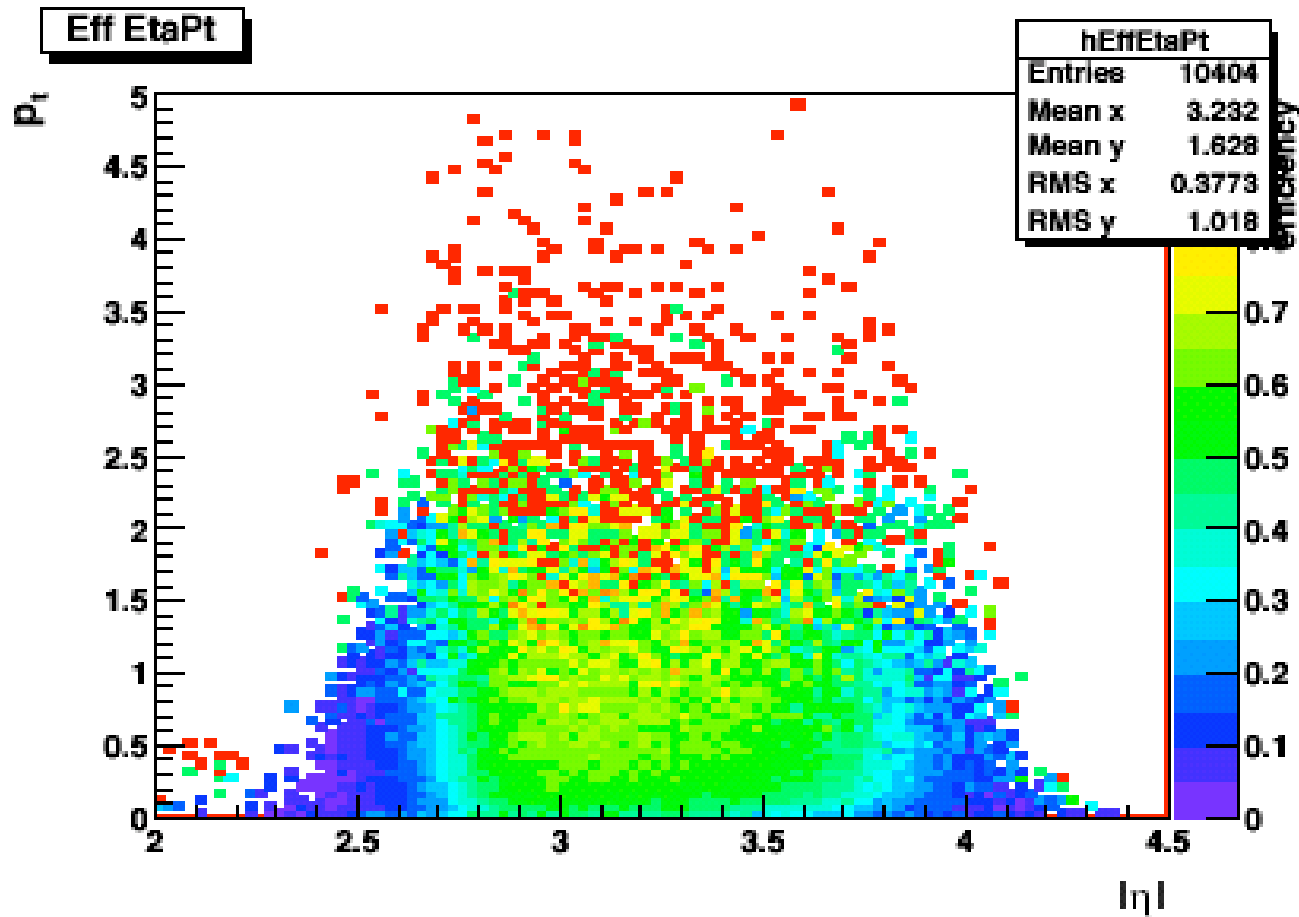
- **Volker Eckardt**
- **Peter Maierbeck**
- **Maria Mora Corral**
- **Markus Oldenburg**
- **Joern Putschke**
- **Janet Seyboth**
- **Peter Seyboth**
- **Frank Simon**



# FTPC pion acceptance



# AuAu efficiency



# dAu efficiency

$|\text{vertex}_z| < 20\text{cm}$

