News from PHOBOS

a first look at d+Au p_T spectra

Gunther Roland/MIT

2003 Conference on
Intersections of Particle and Nuclear Physics

PHOBOS Collaboration (May 2003)

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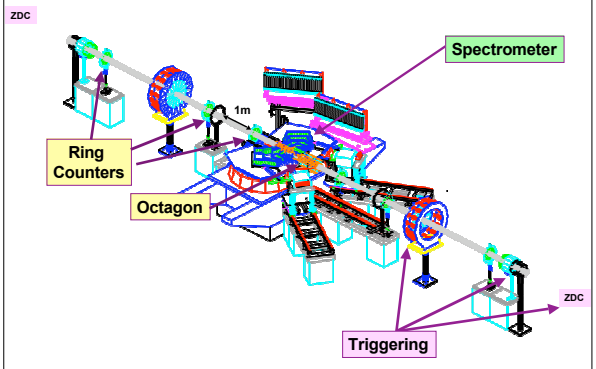
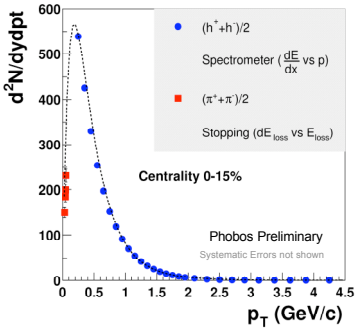
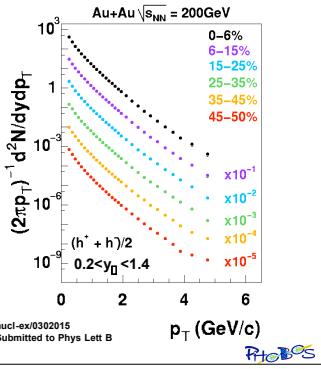
PHOBOS Detector in 2002



p_T Distribution of Charged Particles



p_T Spectra for Au+Au @ 200 GeV



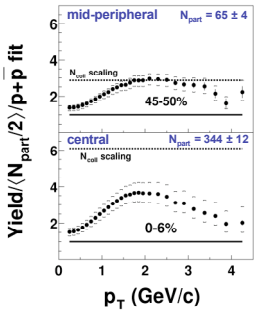
Centrality	N_{part}
45-50%	65 ± 4
35-45%	93 ± 5
25-35%	138 ± 6
15-25%	200 ± 8
6-15%	276 ± 9
0-6%	344 ± 12

Centrality range:

<b> from 10 to 3 fm

<N_{part}> from 3 to 6

Ratio of Au+Au and $p\bar{p}$ spectra at 200 GeV



- Strong modification of spectral shape relative to pp
  - already in mid-peripheral events
- Strong violation of expected N_{coll} scaling
  - Jet quenching?
  - Initial state Gluon Saturation?

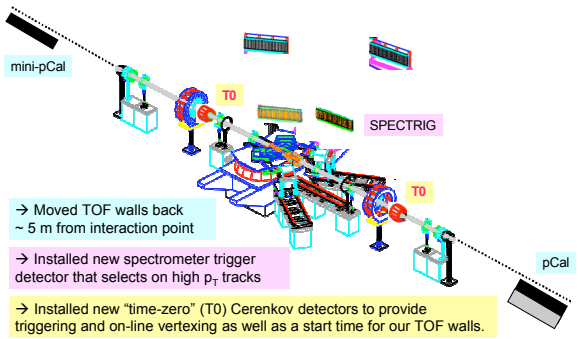
d+Au essential to test
which physical approximation
to Initial State Physics
is closer to reality

This is the well learned lesson
from J/Psi at SPS

BNL 3/6/03 Gyulassy 19

ok, so let's look at d+Au….

This Year: PHOBOS Detector 2003



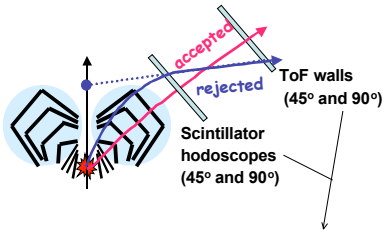
→ Moved TOF walls back
~ 5 m from interaction point

→ Installed new spectrometer trigger detector that selects on high p_T tracks

→ Installed new "time-zero" (T0) Cerenkov detectors to provide triggering and on-line vertexing as well as a start time for our TOF walls.

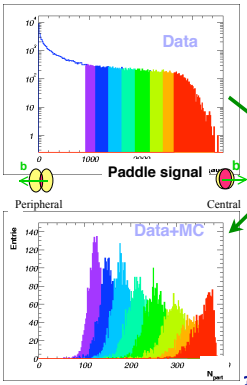
→ Proton calorimeter on Gold and Deuteron "going" sides for dA run

Spectrometer Trigger



- Select events with particle hitting ToF wall
- Enhance high-p_T (straight) tracks: "online" tracking
- Decision made in 50 ns

Reminder: Centrality in Au+Au

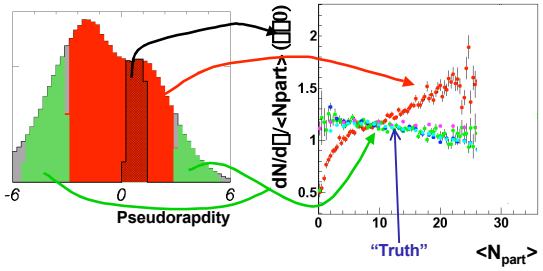


Paddle: Multiplicity in $3 < |\eta| < 4.5$

HIJING +GEANT
Glauber calculation
Model of paddle trigger

Centrality determination in d+Au

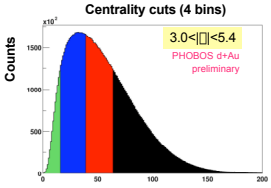
HIJING d+Au MC



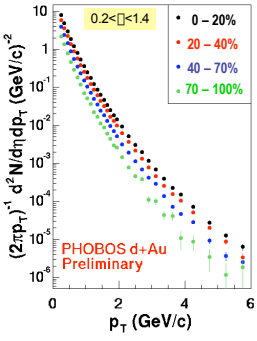
Centrality in d+Au: Handle with care!

Preliminary Results from d+Au

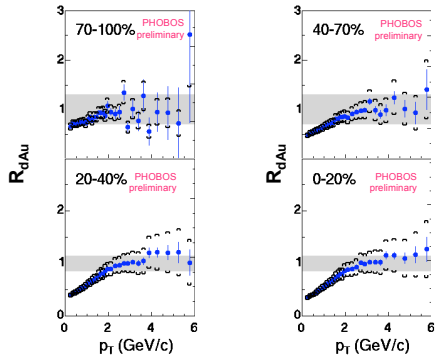
Centrality cuts (4 bins)



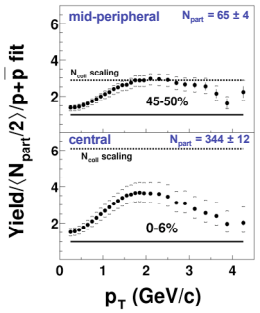
Centrality	N_{part}
70-100%	3.3 ± 1
40-70%	6.8 ± 2
20-40%	11 ± 1.5
0-20%	16 ± 2.5



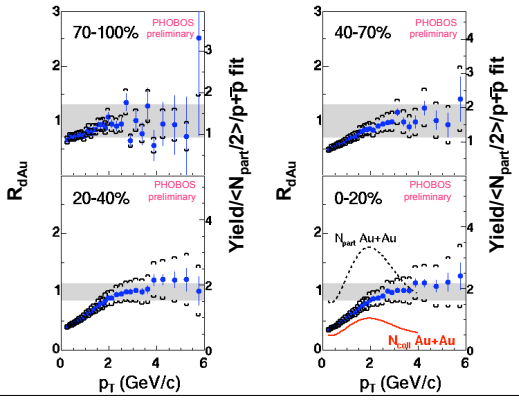
Preliminary Results from d+Au



Reminder: Au+Au/p$\bar{p}$ at 200 GeV



Preliminary Results from d+Au



Summary

- Successful run of upgraded Detector
  - Forward Proton calorimeter
  - Spectrometer Trigger
  - Online vertex Trigger.
- First Look: Centrality dependence of d+Au p_T spectra
  - Resemble p+A fixed target data
  - Very different from Au+Au
- Much more to come
  - 4-[] dN/d[]
  - PID spectra, ratios
  - *?*