

# **PHENIX Status**

Time meeting 09/02/2016

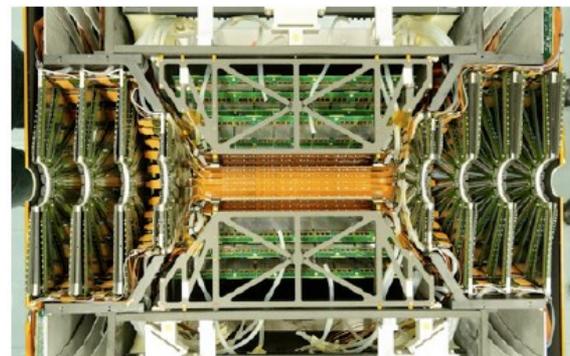
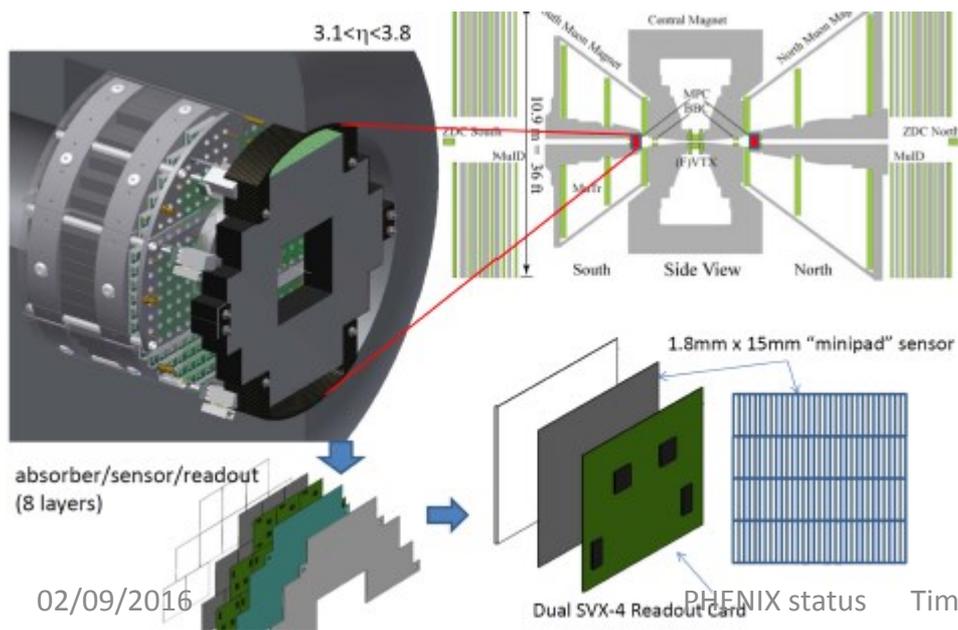
Denis Jouan

PHENIX Run 16 Coordinator

Institut de Physique Nucléaire Orsay,  
CNRS/IN2P3, université Paris sud, Université Paris Saclay

# Context

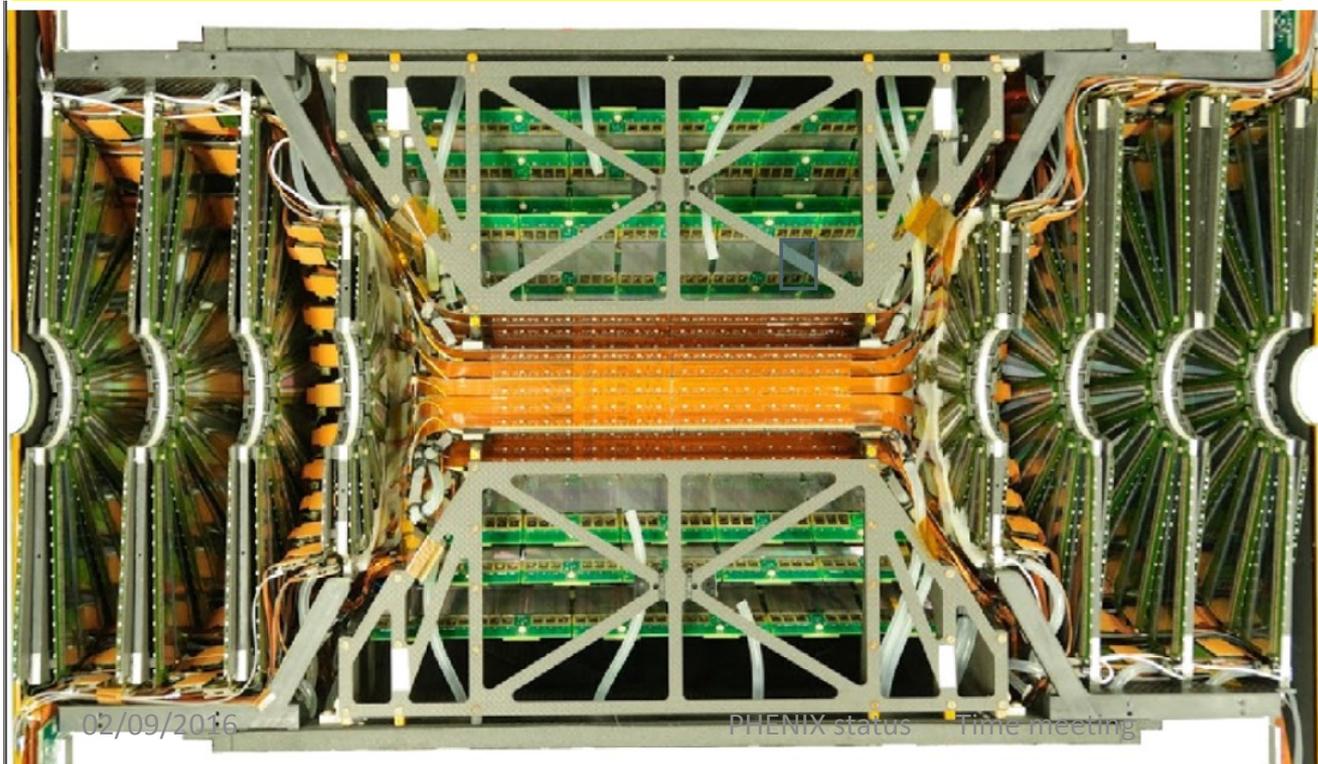
- Last PHENIX run
- Detector: with FVTX, VTX and MPC(+MPC-EX)
- AuAu 200: Increasing the dataset, HF-> double the data, complete HF measurement
- dAu energy scan : onset of QGP in small systems



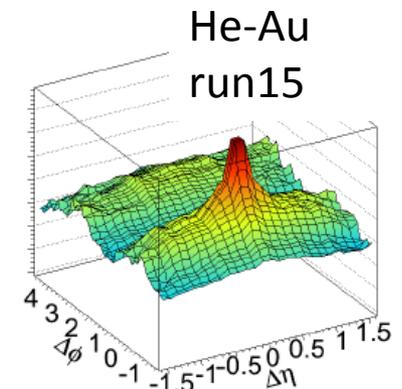
Vertex detector is necessary for Heavy Flavor studies, and improves in particles correlations

# A very important requirement for collisions : $|z| < 10\text{cm}$

- In the  $|Z| < 10\text{cm}$  vertex: **> 7KHz up to end of store**
  - **+ high average luminosity**

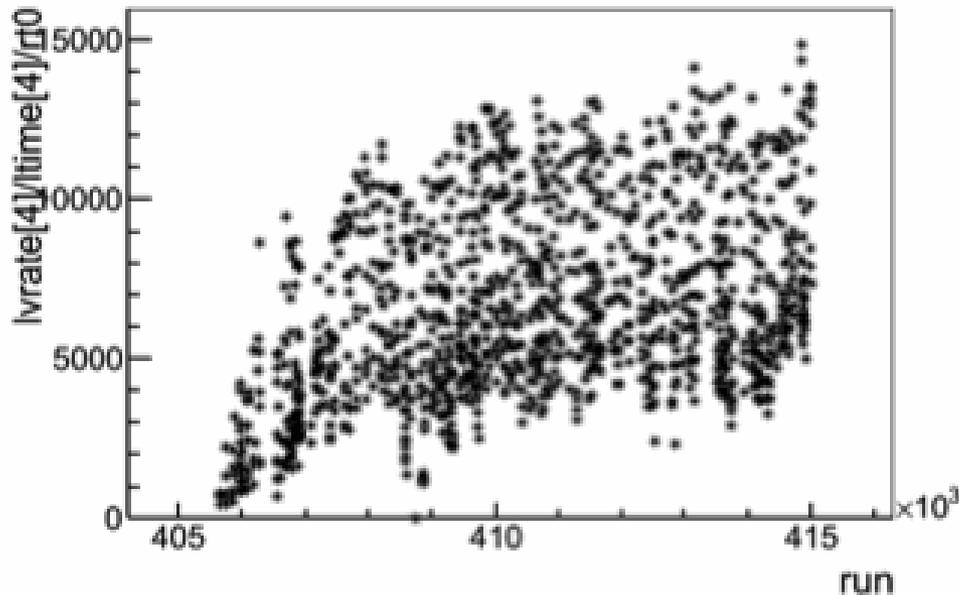


The extended coverage brings new performances in d-Au: for instance the event plane



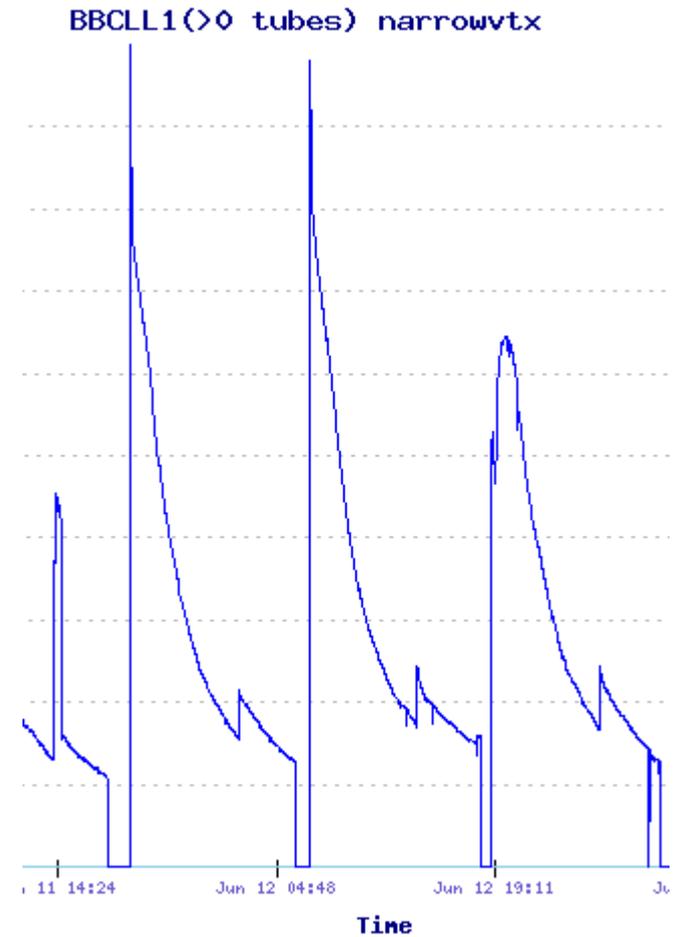
# End of run 14 AuAu 200 conditions were not so far from our 7KHz goal

BBCLL1\_narrow collision rate



Raw Rates(Hz) in Z<10 cm vertex range  
(=narrow)

**current conditions: around 5 KHz during run  
(3-6.5 sunday, 3.5-8 monday)**



# Calendar

- Watch shifts started 12 January
- Full shifts started 26 January
- Carriage closed on 29 January
- BBC timing with collisions started 5 february,
- Followed by final commissioning of subsystems,
- Updating of monitoring,
- Recording physics run since 6 february midnight.  
Efficiency improving.
- “physics declared” Sunday morning 7 January after  
9 o’clock meeting

# Some example

## ✓ BBC preparation for Run16

Ready for Run16 (done, Dec. 1-23)

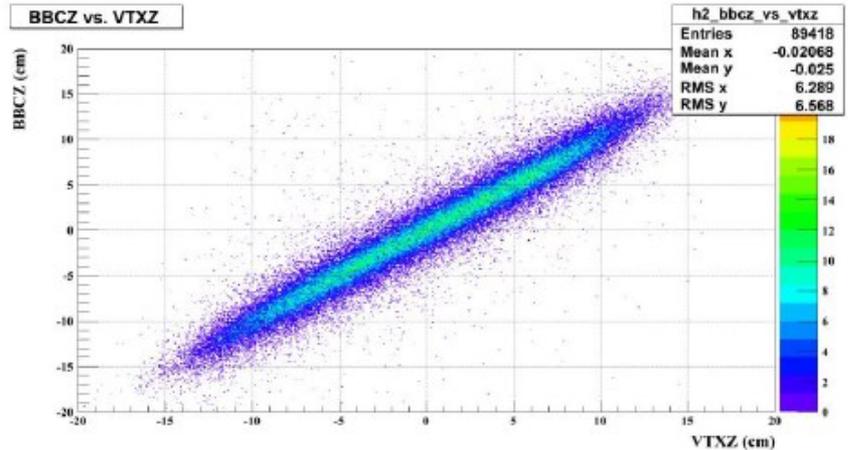
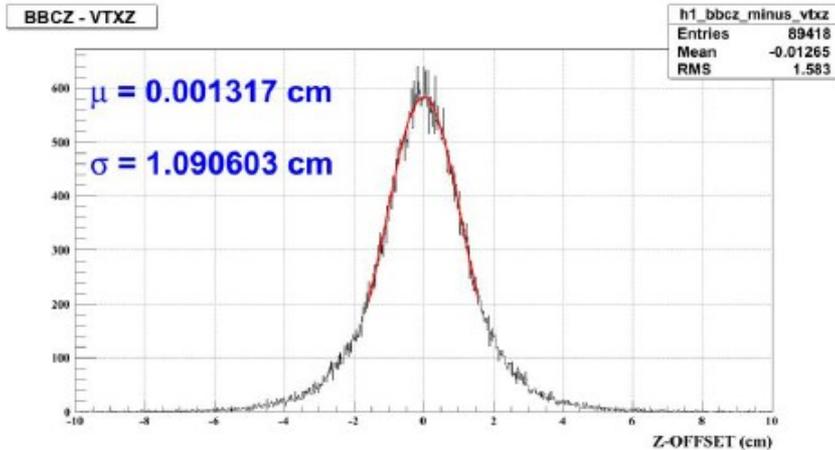
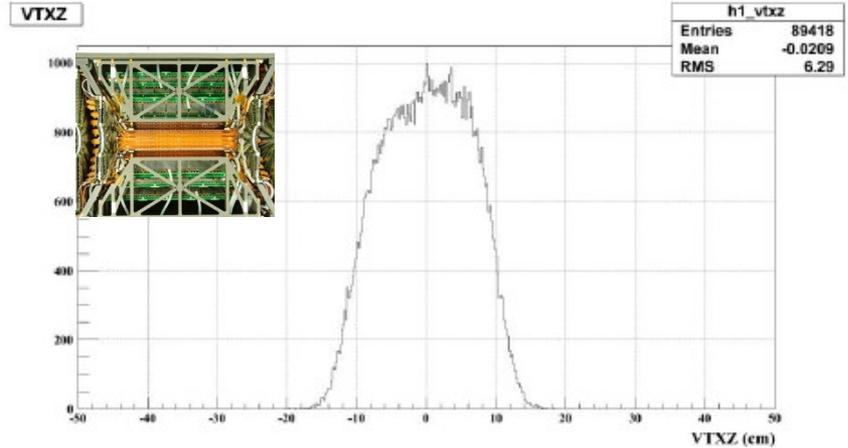
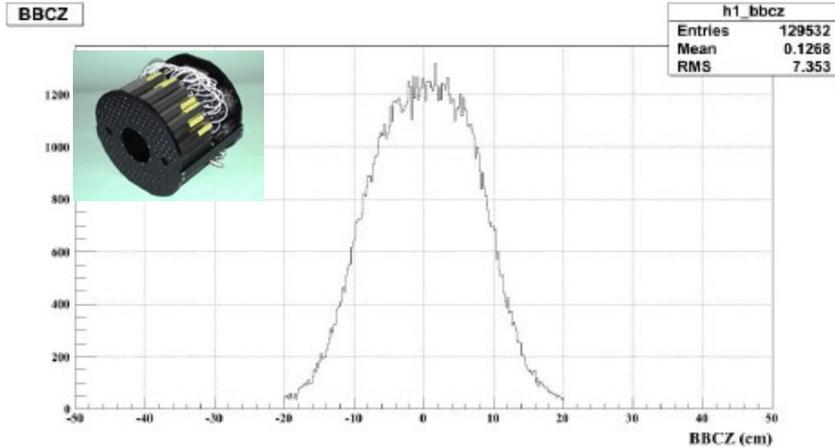
- HV interlock test (done)
- FEM T/Q scan (done)
- Check and record of thermal noise and laser signal waveform (done)
- Laser time-in (done)
- Initial HV setting with Laser event (done)



Laser signal at PMT1

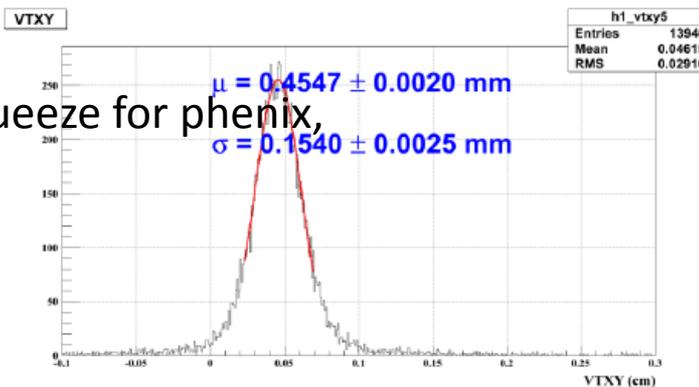
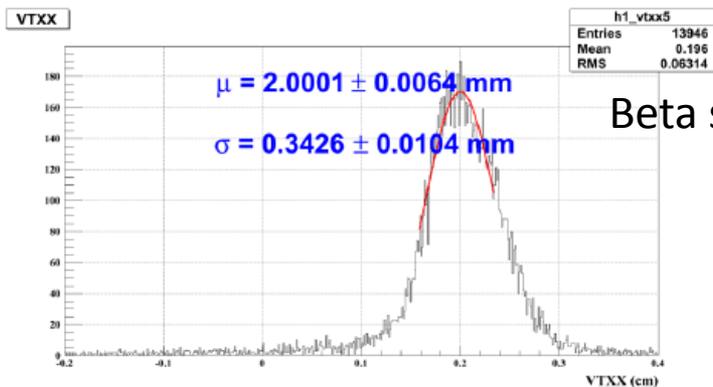
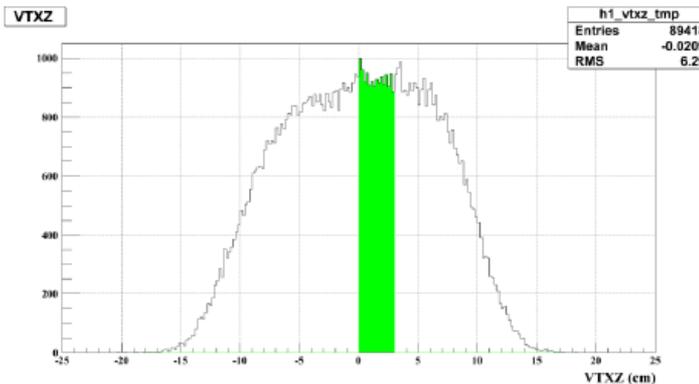
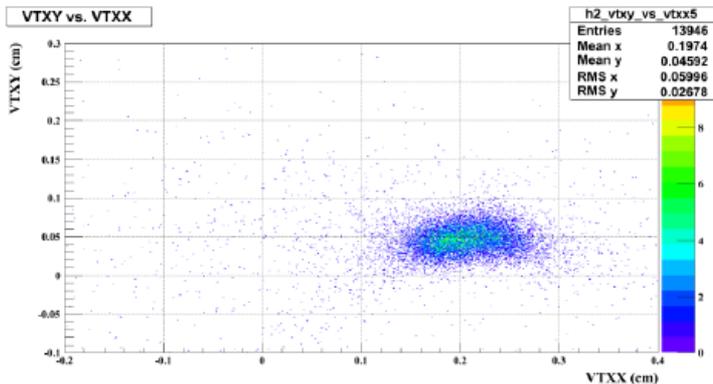
- Last Friday: timing with « blue clock », calibration with particles, (iterations)
- Saturday night: fine tuning of time with respect to VTX

# « ~On line » vertex



- BBC and VTX vertexes distributions: centered within  $13\mu\text{m}$

# Trigger: MB

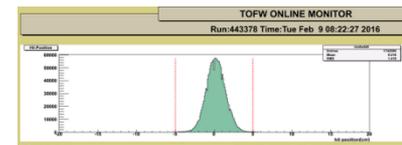


Beta squeeze for phenix,

0 cm < VTXZ < 3 cm

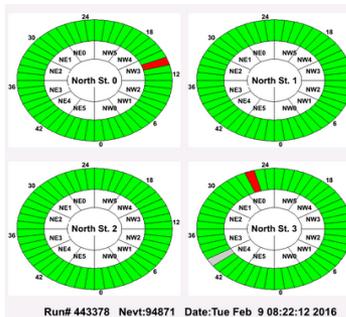
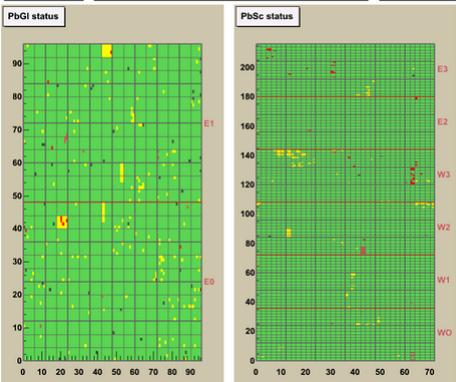
**Collisions spot: 0.34 mm \* 0.15 mm**  
**X,Y Position in VTX: 2mm, 0.45mm**

# Good state of subsystems

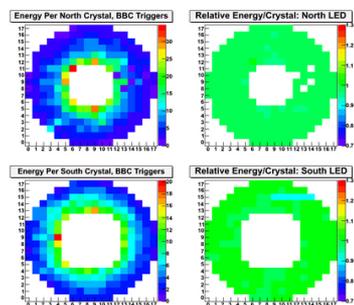


Edit	Date	RC/PC	Eve	Owl	Day	Nex124	DAQ	OnCal	LVL1	BBC	ZDC	FVTX	VTX	DC	PC	EmCal	RICH	ERT	Aero	TOFE	TOFW	MuTr	MuID	MPC	MPCEX	Magnets	Trigger	
Edit	2016-02-08	Orange	Grey	Orange	Orange	Orange																						
Edit	2016-02-07	Orange	Blue	Orange	Orange	Orange																						
Edit	2016-02-06	Orange	Orange	Orange	Orange	Orange	Red	Orange	Orange	Orange	Blue	Blue	Blue	Blue	Orange	Blue	Blue	Orange	Orange	Orange	Orange	Orange						
Edit	2016-02-05	Orange	Orange	Orange	Orange	Orange	Red	Orange	Green	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange											
Edit	2016-02-04	Orange	Green	Green	Orange	Orange	Orange																					
Edit	2016-02-03	Orange	Orange	Orange	Orange	Orange	Green	Orange	Green	Orange	Orange	Orange																
Edit	2016-02-02	Orange	Orange	Orange																								
Edit	2016-02-01	Orange	Orange	Orange																								
Edit	2016-01-31	Orange	Orange	Orange	Orange	Orange	Green	Orange	Orange	Orange	Orange	Orange	Orange	Blue	Orange	Orange	Orange											

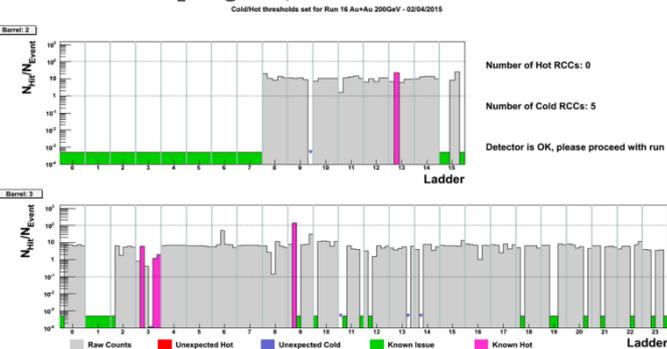
EMCal PBGL Run# 443378, Time: Tue Feb 9 08:22:27 2016 EMCAL PBSC



MPCMON\_2 Run 443378, Time: Tue Feb 9 08:22:06 2016

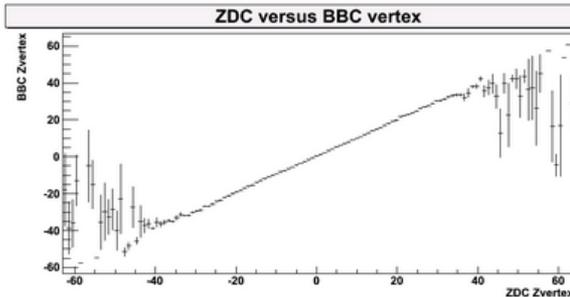


SVXSTRIPMON\_4 Run@ 443378, Time: Tue Feb 9 08:22:12 2016 Events: 125822

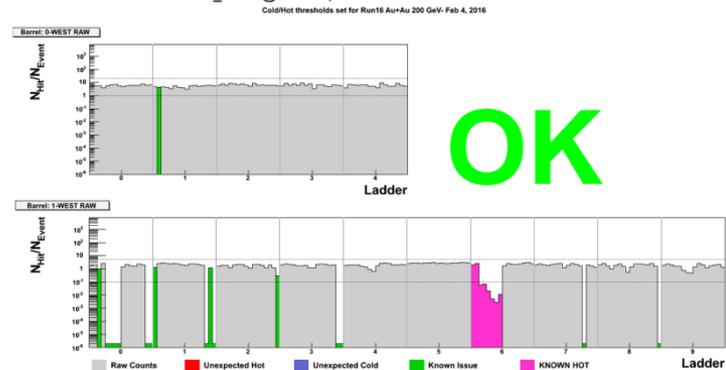


## ZDC ONLINE MONITOR

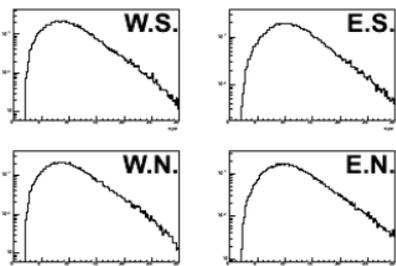
Run 443378, 142299 events processed Date:Tue Feb 9 08:22:27 2016



SVXPXELMON\_2 Run@ 443378, Time: Tue Feb 9 08:22:06 2016 Events: 2852



## photo-electrons per ring for each sector



02/09/2016

PHENIX status Time meeting

(Just a reminder)

## d-Au : 5 weeks, 4 energies

- “**Five to seven weeks** of running to perform a small system beam energy scan (PAC) »

Our optimized choice for **5 weeks**:

- 20 GeV 1.5 week 9M (BUP: 7M)
- 39 GeV 1.5 week 110M (110M)
- 62 GeV 1. week 160M (230M)
- 200 GeV 1. week 1.6 B (2.4B)

Allowing a complete energy scan in the same detection conditions, and keeping BUP and PAC goals of measuring the **excitation function** of 2-particle **correlations** and **V2**, and possibly - the first **BES** measurement of **V3 in small systems** at RHIC.

# Summary

- Recording data since Saturday 6 February

Wishlist for the future:

- Au-Au  **$Z < 10\text{cm}$**   **$> 7\text{KHz}$**  up to end of store

(+ higher integrated per week total Luminosity also gladly accepted)

(from RHICrun16 page)

		Run-14	Run-16
$E$	GeV/nucleon	100	100
$L_{\text{peak}}$	$10^{26}\text{cm}^{-2}\text{s}^{-1}$	90	??
$L_{\text{avg}}$	$10^{26}\text{cm}^{-2}\text{s}^{-1}$	50	??
$L_{\text{week}}$	$\mu\text{b}^{-1}/\text{week}$	2000	??

[as of 12/11/2015]

- dAu: **5 weeks** physics run (4 energies) needed

# Backup

# D-Au BES: some extracts from the PAC June 2015:

In “2.2 Discussion of run 16 priorities:”

“2.2.2 **Five to seven weeks** of running to perform a small system beam energy scan: »

- ....« These measurements capitalize on the **unique and impressive versatility of the RHIC accelerator in providing a variety of collisions systems and energies.**”
- ... “**One of the hottest topics** in heavy ion physics in the past few years is the observed similarity between the behavior of many observables for p+p, p+A, d+A, 3He+A, and A+A, which poses the fundamental question of how small a system can exhibit thermalized QCD behavior. What is the smallest possible droplet of QGP, and how does the answer to this question depend on the collision energy and event multiplicity, which is to say on the temperature of the QGP in question? Addressing this newly opened, and challenging, question promises to deepen our understanding of, for example, which requirements have to be fulfilled for hydrodynamics to be applicable. »

# Store stability: Au Au

Acquisition rate : 6-7 KHz

At beginning of store, part of the bandwidth is devoted to rare triggers

the second part of the store causes a lowering of the average rate of Z<10cm events

« effective luminosity » for phenix depends on **keeping the Z<10cm rate above 7KHz** in the 2/3 second part of the store

