

PHENIX RUN-10



Stefan Bathe, APEX Workshop 2009

Introduction

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- Detector installation complete for Run 10
- Safety system, magnet, and detector setup and testing under way
- Rack room air conditioning upgrade almost complete
- Preparing to begin detector operation Dec 1
- However half the IR air conditioners still need service!

Goals

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- 1st priority: 10 weeks of 200 GeV Au+Au
 - High-quality/low-bckgrd low-mass dilepton measurement with HBD
 - signature for chiral symmetry restoration
 - HBD (Hadron Blind Detector) will be replaced by VTX after Run-10
 - Accumulate statistics for rare signals: e.g. high- p_T photons, J/ψ
- 2nd priority: begin energy scan, focusing first between full and injection energy
 - 4 weeks of 62.4 GeV Au+Au
 - Energy dependence of low mass dilepton enhancement
 - 39 GeV , lower energies
 - Search for onset of v_2 saturation and quark scaling
- 3rd priority: p+p development

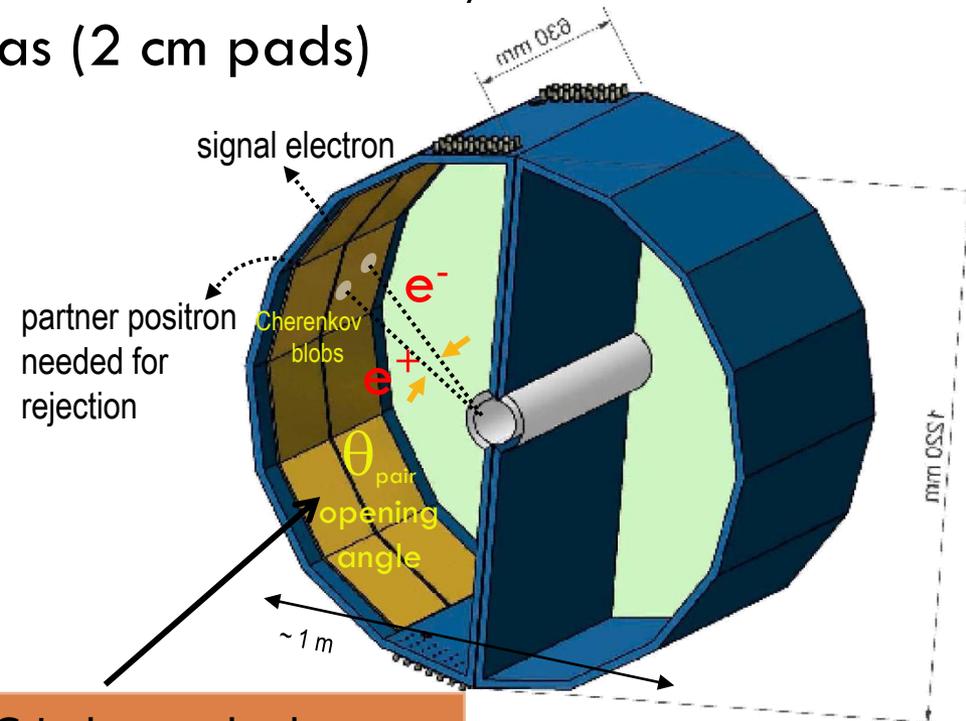
Hadron Blind Detector (HBD)

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- Designed for low-mass dileptons in A+A
- Removes combin. bckgrd from Dalitz and conversion pairs (small opening angle)

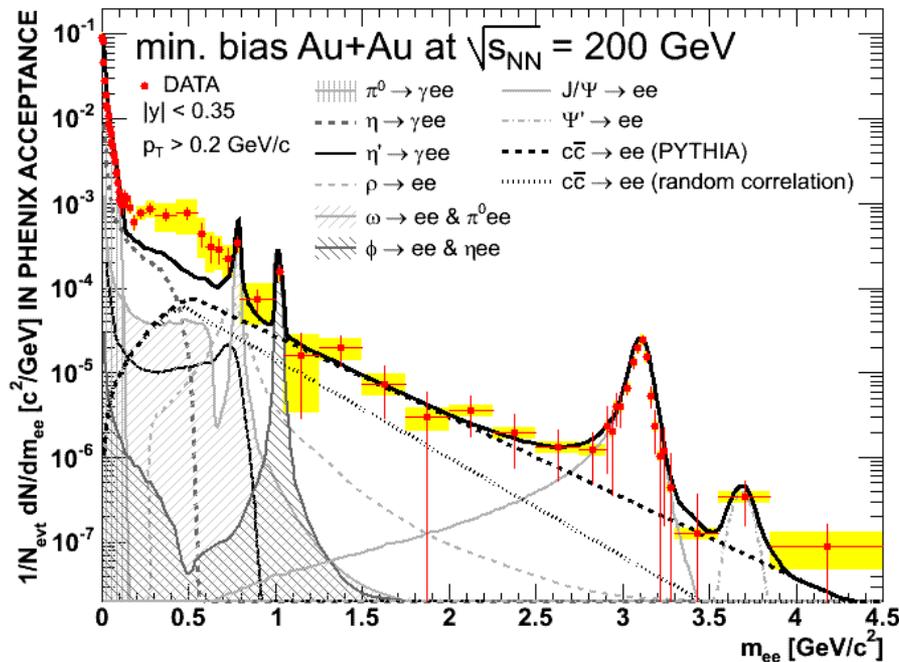
- Windowless Cerenkov detector with CF₄ avalanche/radiator gas (2 cm pads)



CsI photocathode covering triple GEMs

HBD Physics

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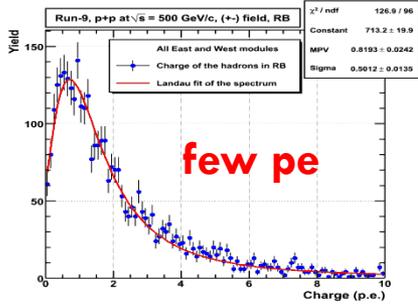


arXiv:0706.3034

- Study electron continuum in low M_{ee} region
- ▣ Measure in medium-modifications of ρ , ω , ϕ
- ▣ Chiral symmetry restoration
- Measure temperature (internal conversion of direct photons)

HBD Performance

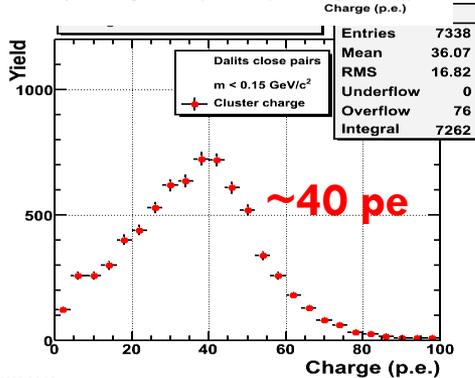
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Measured in Run-9

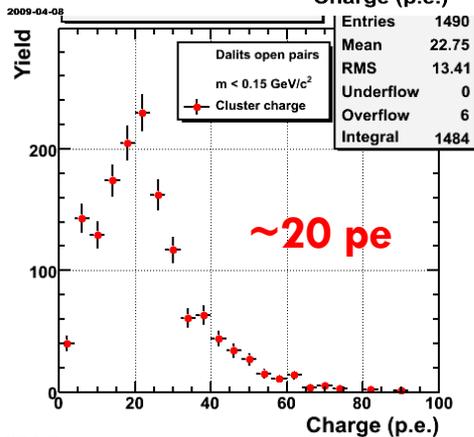
hadron blind

- Taking data in Runs 9, 10
- Will be replaced by VTX after Run-10



background
(Dalitz, conversion):
40 photo-electrons

Clear separation of signal and background

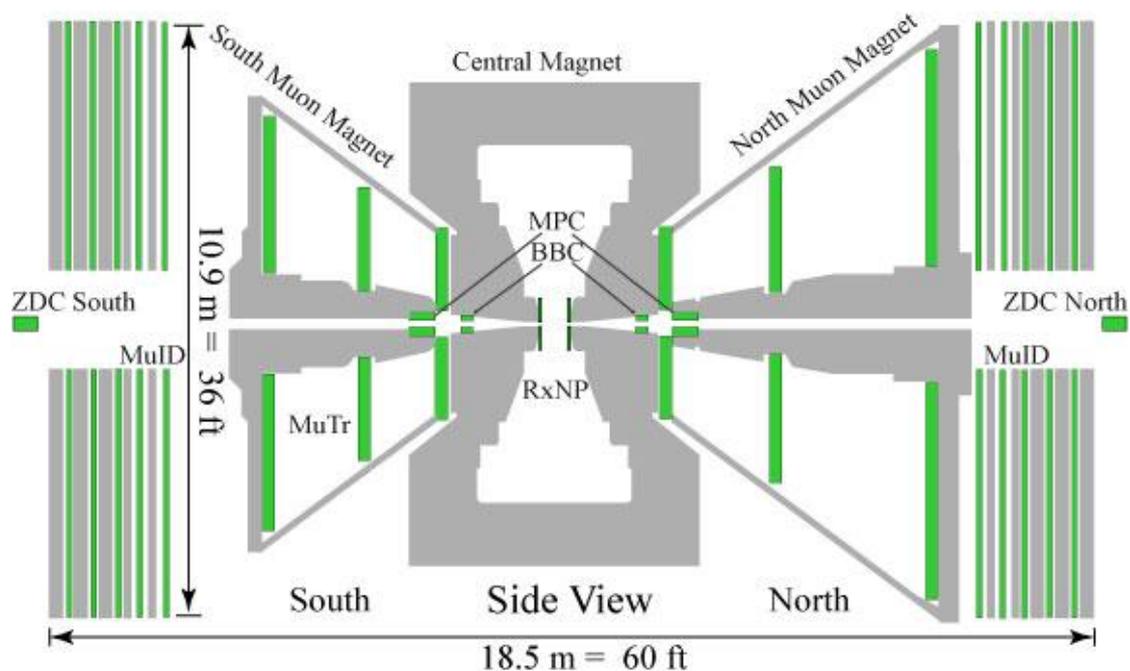
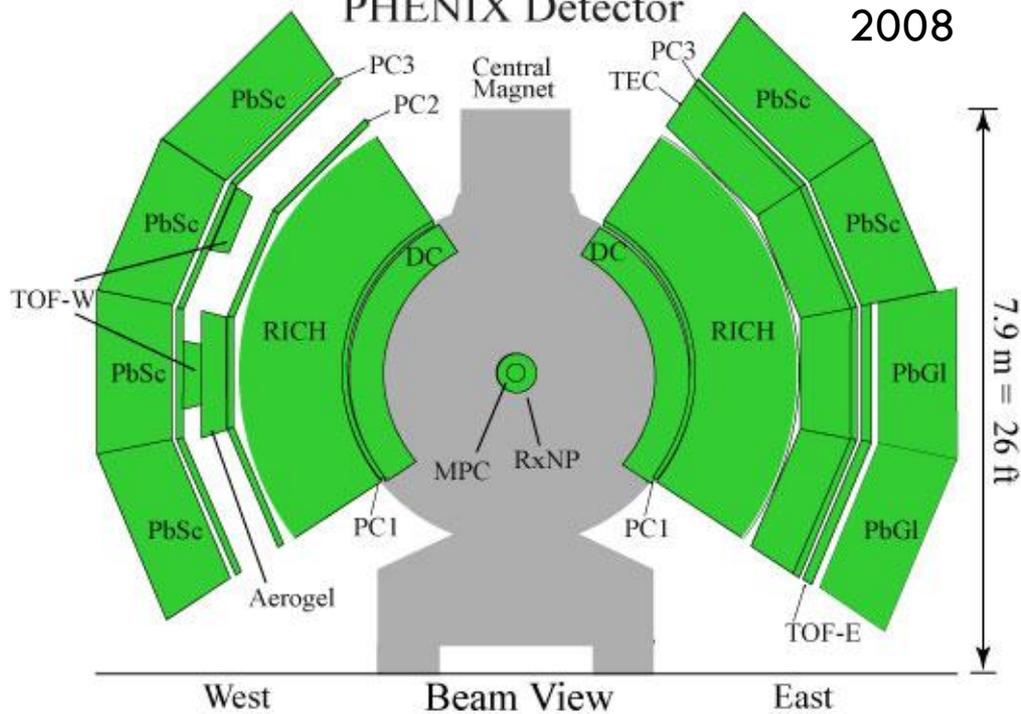


signal
(separated electrons):
20 photo-electrons

Suppression of background pairs increases effective statistics by factor 8-16

PHENIX Detector

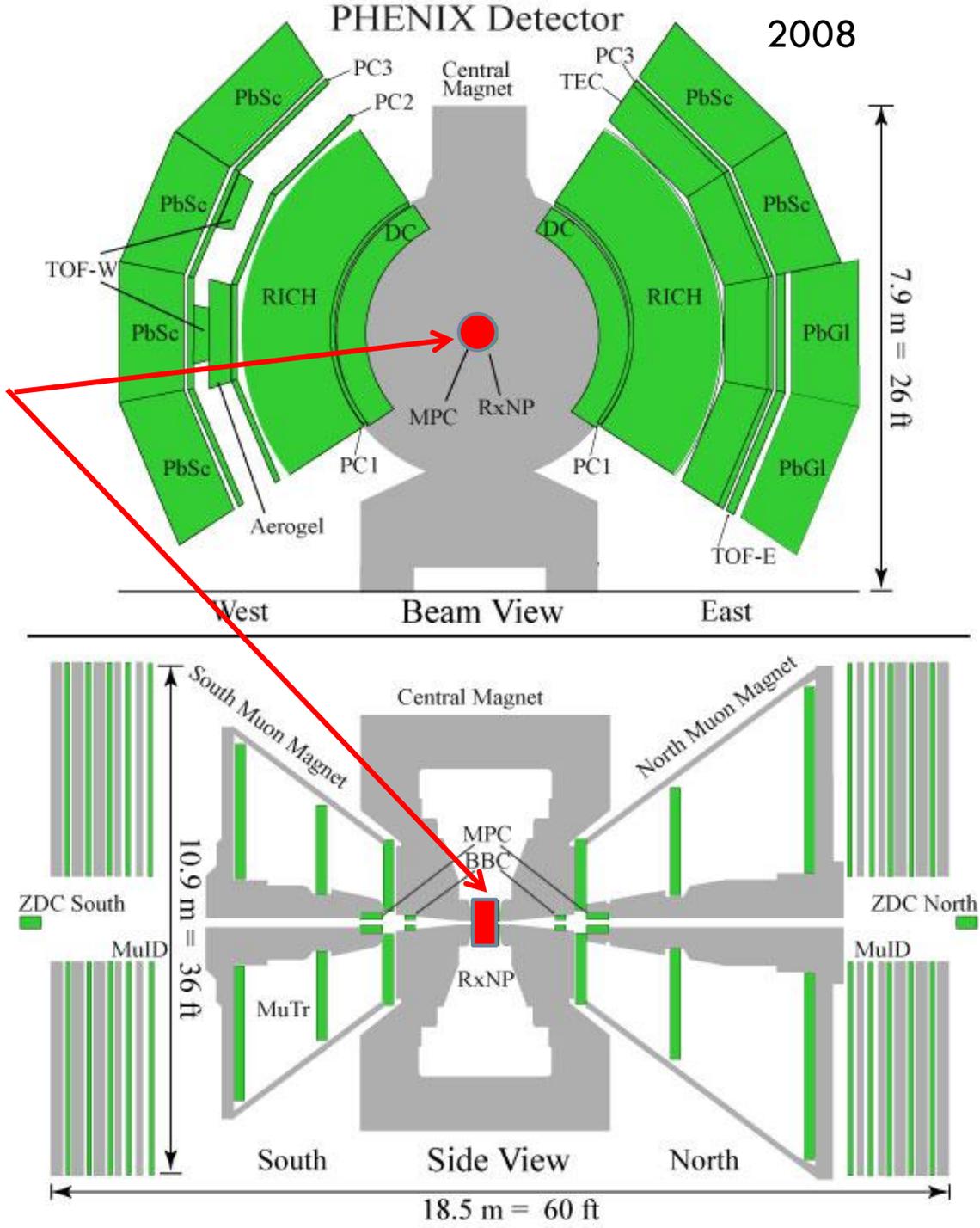
2008



PHENIX Detector

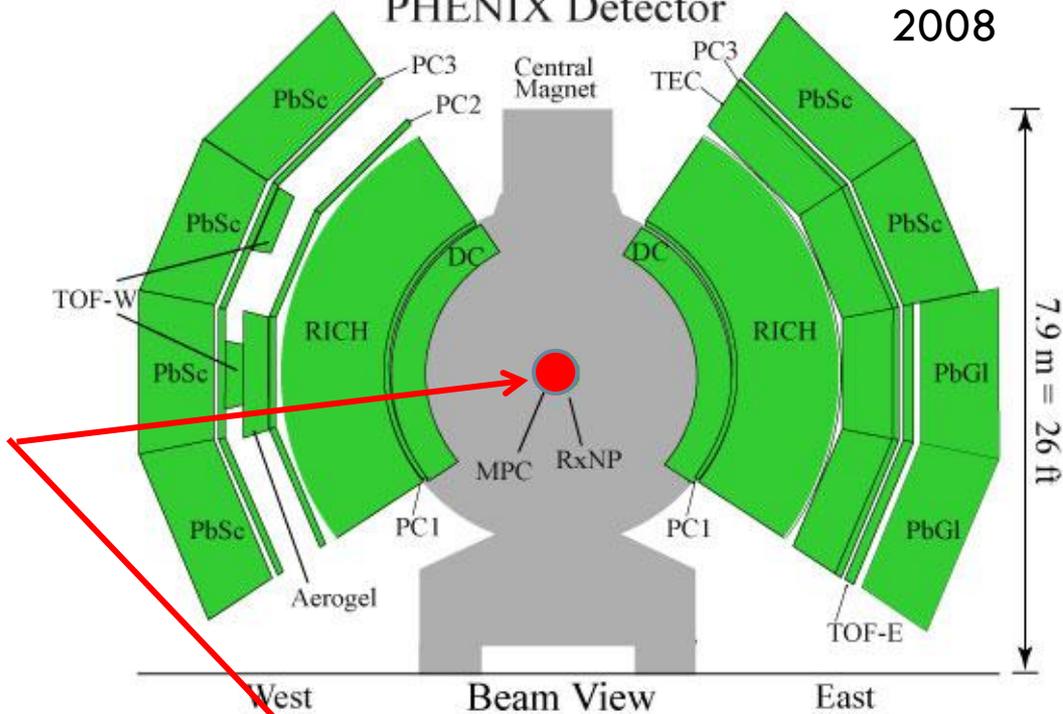
2008

2009/ HBD
2010

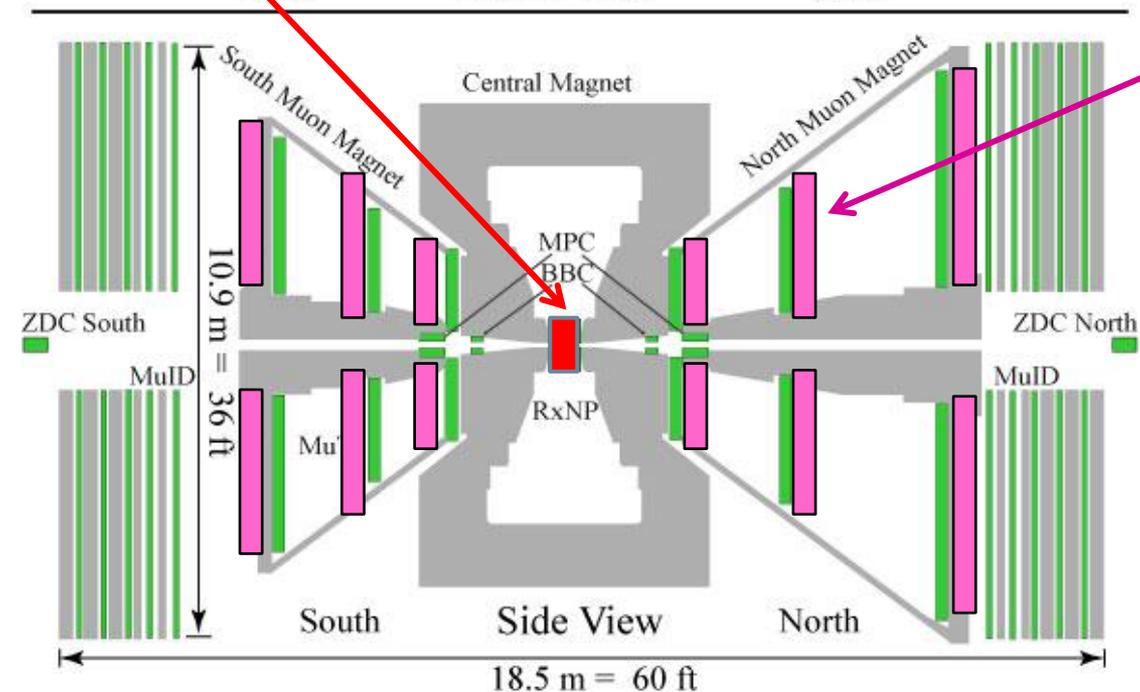


PHENIX Detector

2008



2009/ HBD
2010

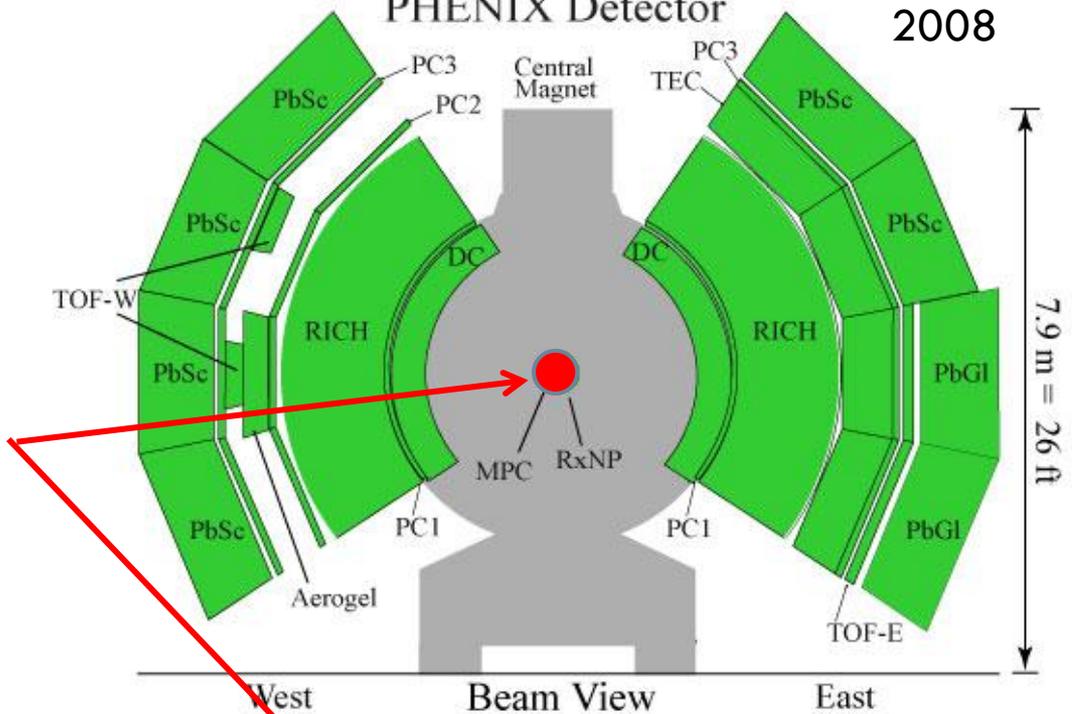


MuTr FEE
2009/10

PHENIX Detector

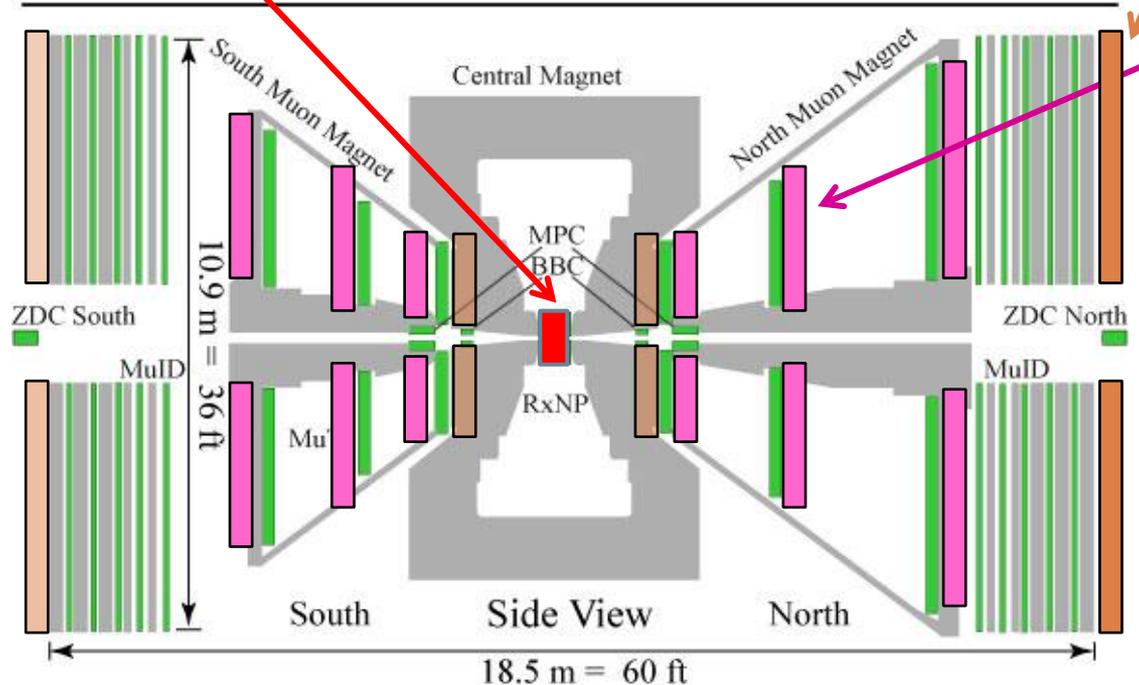
2008

2009/ HBD
2010



RPC
2010/11

MuTr FEE
2009/10



Installations during 2009 shut down

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- HBD East is repaired and back in IR
- PC1 bad chamber swap is done
- DC-East wire repair done
- MuTrg FEE Installation is complete
- All north Muon RPC half octants installed in tunnel
 - ▣ Run-10 is test run only for RPC's



Desired Beam Experiments

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- Commissioning of longitudinal and vertical cooling
- β^* development from 0.6 to 0.5
- Increase luminosity for low-energy running
- Modifications to timing for low-energy running
 - ▣ Would like to know which bunch is which
 - ▣ Do dry run (w/o beam) with decreased clock frequency for detector tests during maintenance day
- p+p development utilizing Au+Au stores
 - ▣ power supply glitch during ramp
 - ▣ can be studied using Au beams
 - ▣ primary issue is precision and dispersion of supply currents during the ramp