

PHENIX Upgrade Plans

Matthias Grosse Perdekamp, UIUC and RBRC

- Issues for Spin in PHENIX
- A complete Chronology of Upgrades
- Upgrades vs Machine vs Spin Physics

Information to look at:

<http://nsac2004.bnl.gov/pres/drees.pdf> and ogilvie.pdf and barish.pdf

Major Issues for Spin in PHENIX

- o limited acceptance in tracking and calorimetry
 - no Jet reconstruction (needed for ΔG , δq)
- o no vertex tracking
 - no event by event heavy flavor physics
- o severe collisions and beam related backgrounds in muon trigger
 - need to pre-scale W- and heavy flavor event candidates
- o no high efficiency hadron trigger
 - reduces yields in inclusive charged hadron measurements
- o readiness for highest luminosities
 - improve relative luminosity measurement
 - improve crossing ID in the muon arm

Complete Chronology of Upgrades

| | | | |
|------|---------------------------------|---|---|
| 2005 | Aerogel | } | PID, inclusive hadrons: A_N , A_{LL} |
| 2006 | TOF | | |
| | RLT | → | Improved relative luminosity |
| 2007 | HBD | → | PID, hadron trigger: A_N , A_{LL} |
| 2008 | muTr-trigger-FEE + muon RPCs | → | Fix muon trigger for W and heavy flavor physics |
| | Barrel silicon tracker | → | vertex resolution for c- and b-physics: A_{LL} large acceptance tracking for jet physics: A_{LL} , A_T |
| 2009 | Forward Silicon | → | vertex resolution for c- and b-physics |
| 2010 | Nosecone Calorimeter | → | direct photon, inclusive neutral pions, jets: A_{LL} |
| 2011 | TPC | → | large acceptance tracking |

Possible Schedule for Future Runs

example: STAR 32 week scenario

$L = 6 \times 10^{30} \text{cm}^{-2}\text{s}^{-1}$

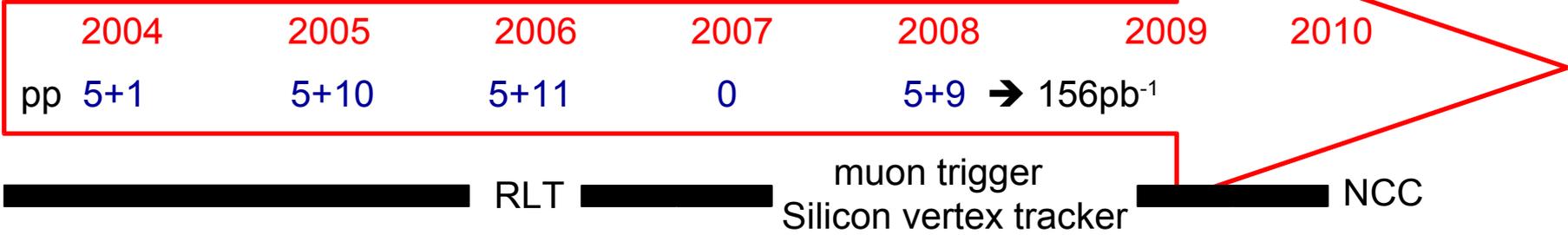
$8 \times 10^{31} \text{cm}^{-2}\text{s}^{-1}$

$P = 0.45$

0.5

0.7

$\sqrt{s} = \dots\dots\dots 200 \text{ GeV} \dots\dots\dots |$



Inclusive hadrons + Jets

Transverse Physics

Charm Physics

direct photons

Bottom physics

W-physics

$A_{LL}(\text{hadrons, Jets})$

$A_{LL}(\text{charm})$

