

Run-8 in February and beyond*

* we hope!

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for the PHENIX Collaboration



It is absolutely crucial to run p+p!

- **RHIC/Collaboration Issue**

2 years in a row without p+p running will send the spin community looking elsewhere

- **RIKEN**

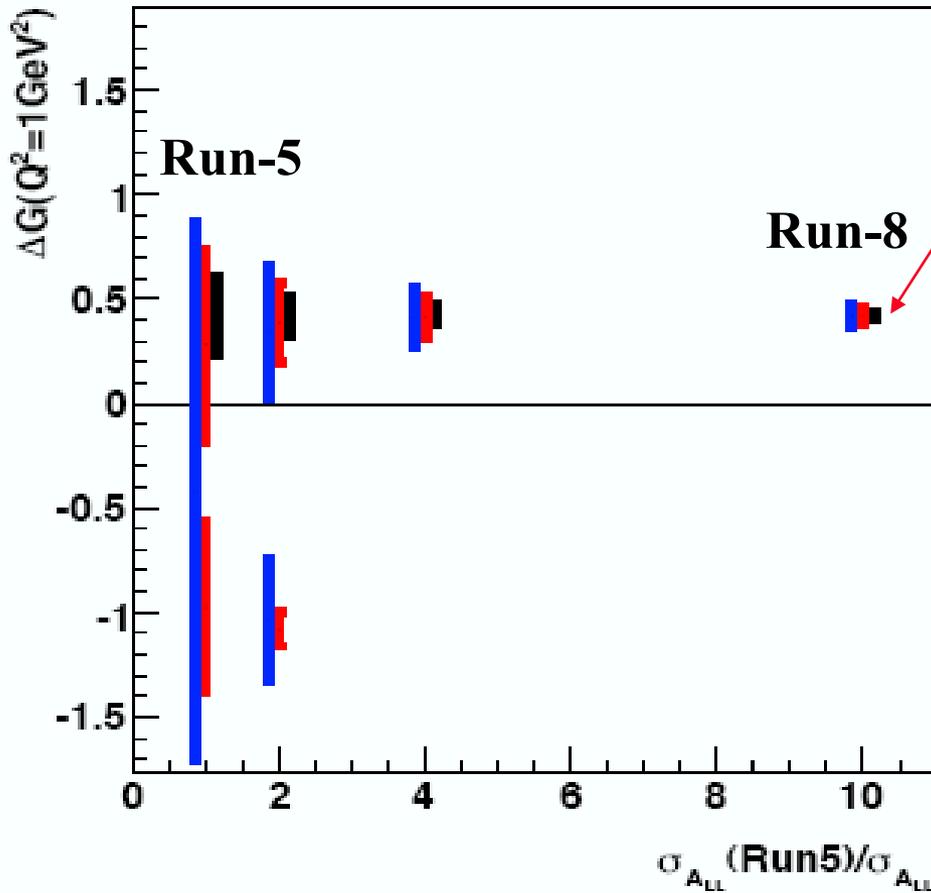
New MOU with BNL started in 2007

2nd year without spin run poses a significant difficulty likely to damage credibility with RIKEN, MEXT

Milestone: First W measurement by March 2011 requires production running in Run-9 or 10



200 GeV p+p goal:



to achieve this, need
 $\geq 71 \text{ pb}^{-1}$ recorded

DOE milestone for ΔG
measurement: 2008

PHENIX remains committed to yearly p+p running,
to develop required luminosity & polarization.
Next goal is 500 GeV p+p for W production

minimum 200 GeV p+p run for new physics

- **5 pb⁻¹ of transverse p+p recorded**
-> 5 weeks of p+p, transversely polarized, physics running.
is 7 cryo weeks enough??
- **goal: forward physics with MPC**
 π^0 in MPC + charged pion single spin asymmetry
- **need a lot more p+p for the Spin Plan milestone.**
This is a *minimum* data set for some new physics



if 4-5 cryo weeks: 500 GeV p+p

- **Goals**

- demonstrate 500 GeV collisions
- establish 250 GeV polarimetry in both p-C and H-Jet polarimeters
- measure cross section for neutral pions & photons
compare to pQCD, publish!
- $W \rightarrow e\pm$
rate: 68 e (single sign) per week for $3.6 \text{ pb}^{-1}/\text{week}$
assume Run-6 $\mathcal{L} \times 2.5$ for emittance shrinkage
- measure J/ψ and Y : 1500/40 $J/\psi/Y \mu\mu$ per week
- study muon backgrounds for W measurement

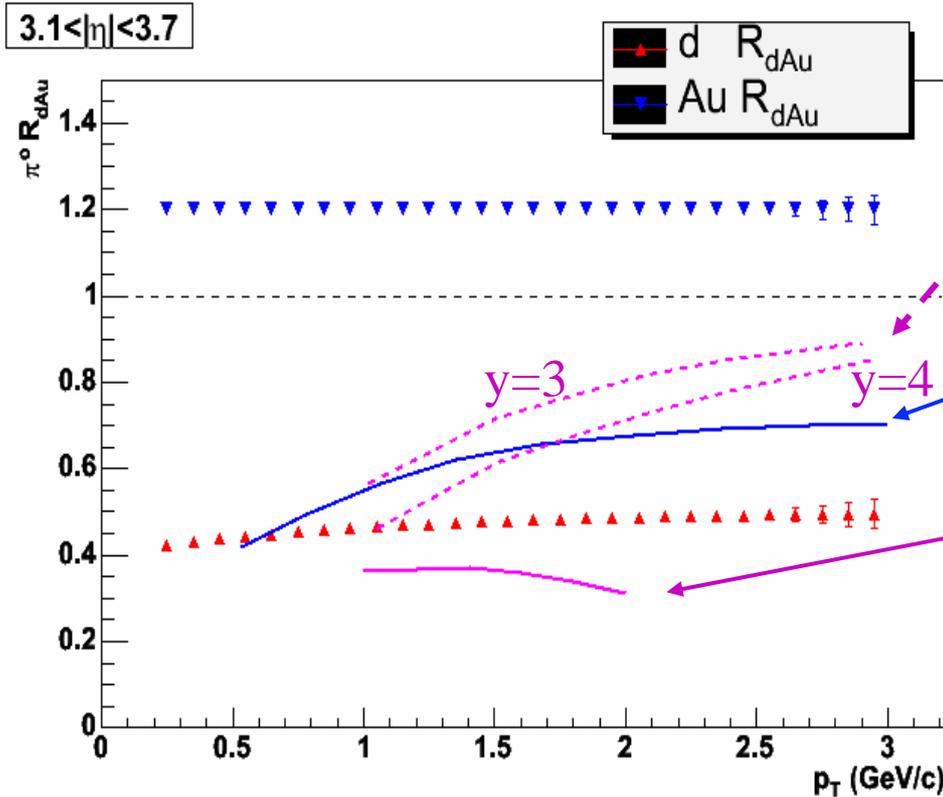
● Important step toward RIKEN RHIC deliverables!



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- **backup slides**



forward π^0 R_{dAu} with the MPC

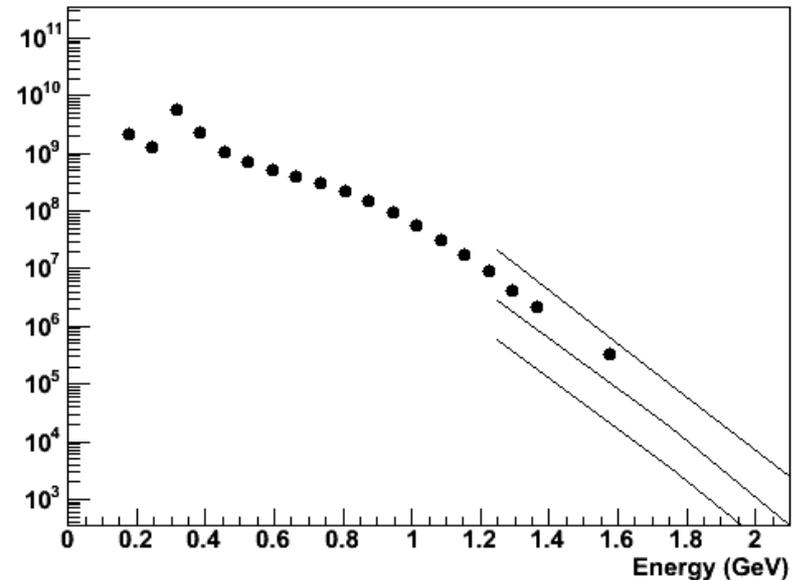


Qiu/Vitev, PLB 632, 507 (2006)
coherent multiple scattering

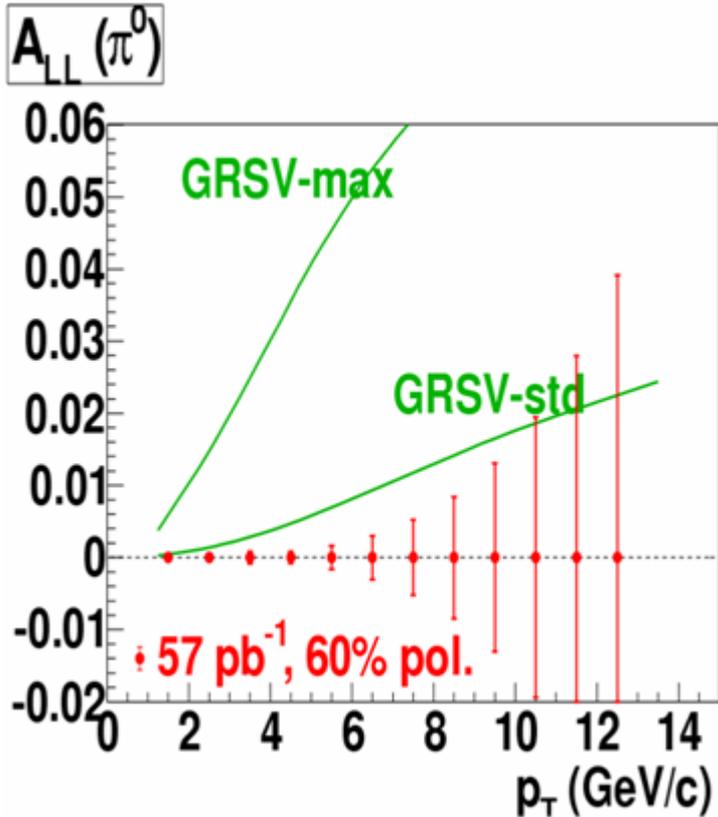
Kharzeev, et al, PLB599
CGC

Vitev, hep-ph/0609156
+ initial state energy loss

π^0 spectrum
in MPC south



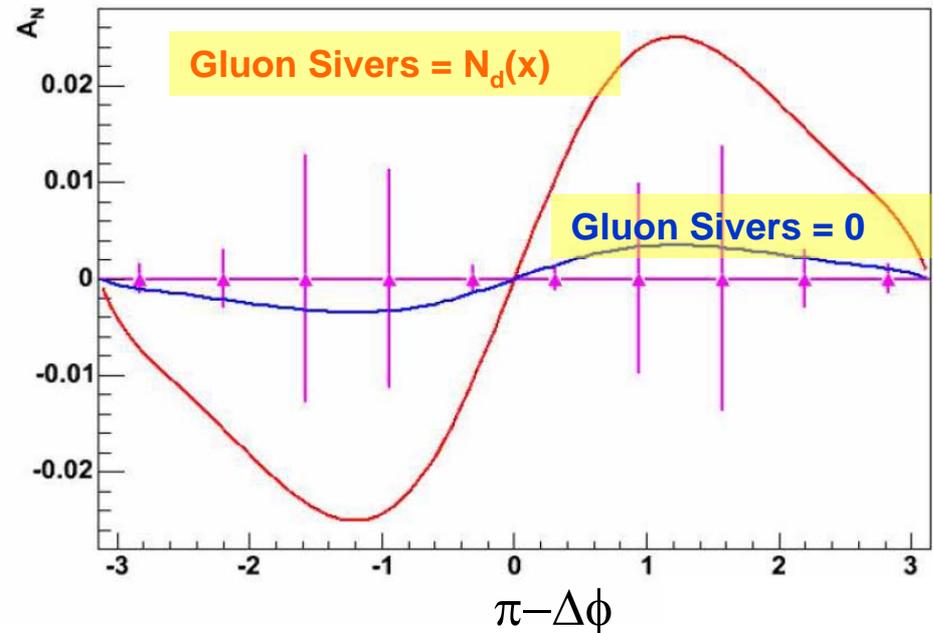
From our previous Run-7 request



approximately
what's expected
for Run-8

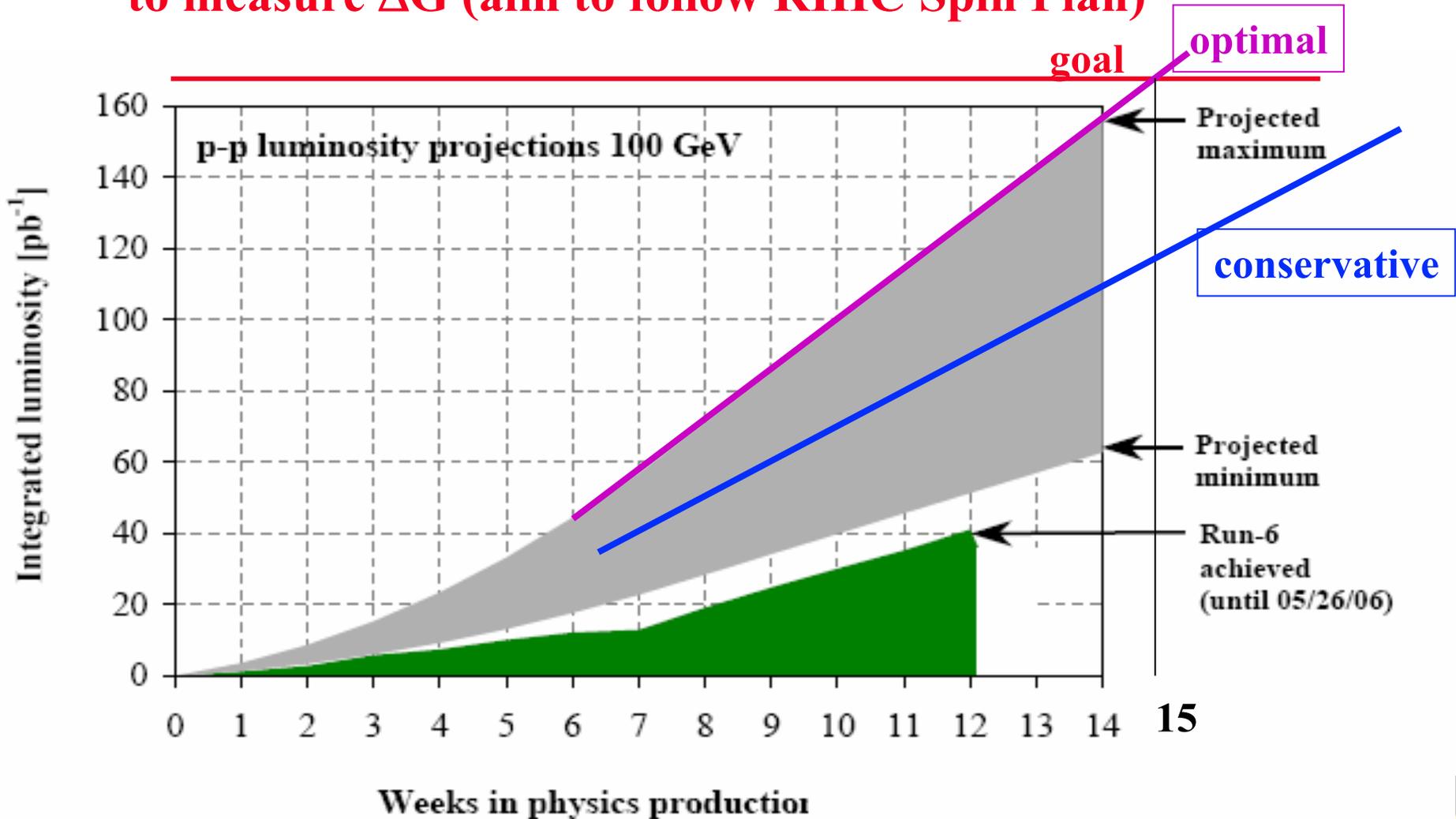
for 2.7 + 6.0 pb^{-1} transverse
pol. recorded (<Run-8)
di-hadron (+ singles)
measurement

[Boer and Vogelsang, hep-ph/0312320](#)



Run-8 polarized p+p

- 71 pb⁻¹ recorded (167 delivered)
to measure ΔG (aim to follow RHIC Spin Plan)



Run 9 & 10 plan

Run-9

- **complete large 200 GeV/A Au+Au data set**
→ **definitive measurements with rarest probes**
- **if needed, complete 200 GeV polarized p+p**
- **begin 500 GeV polarized p+p for W production**
- **aim to begin low energy scan & utilize HBD**

Run-10

- **begin commissioning VTX detector (HBD removed)**
→ **both p+p and heavy ion running**
ion species/energy depend on Runs-7,9 and EBIS
- **significant 500 GeV polarized p+p for W production**
utilizing muon trigger

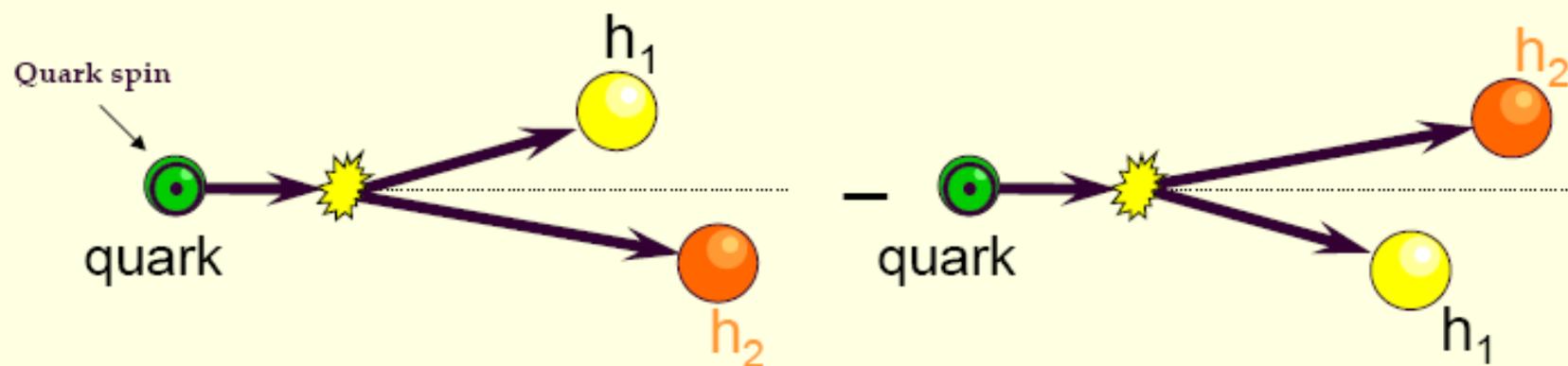


Comparison of IFF and Collins FF

Interference fragmentation function $H_1^{\times}(z, M_{\pi\pi}^2)$

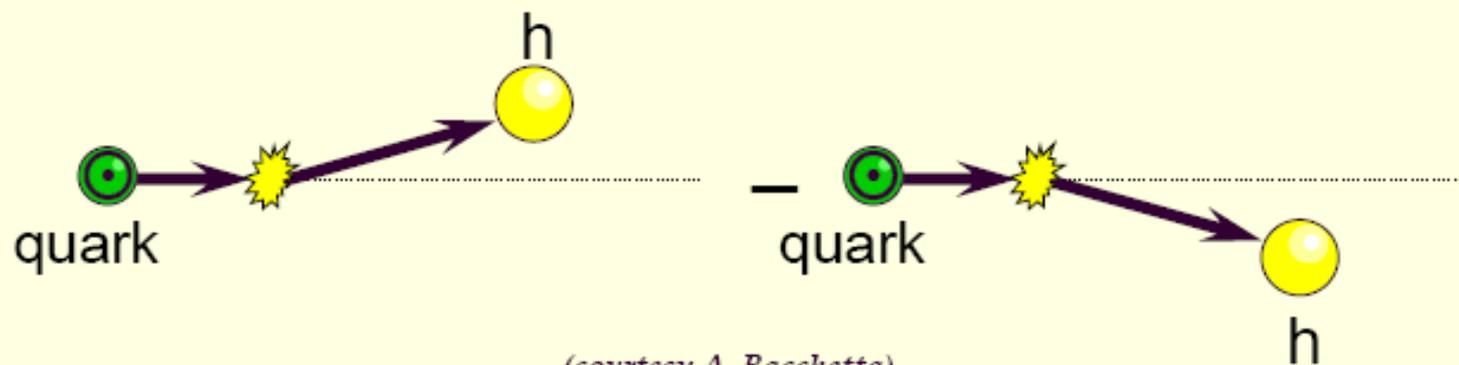
J. Collins S.Heppelmann, G. Ladinsky, Nuclear Physics B, 420 (1994) 565

R. Jaffe, X. Jin, J. Tang, Physical Review Letters, 80 (1998) 1166



Collins fragmentation function H_1^{\perp}

J. C. Collins, Nucl. Phys. B396, (1993) 161



(courtesy A. Bacchetta)

