

## RHIC Spin Plan

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This presentation was an introduction to an excellent meeting, discussing the plans for the spin program, set to start next month.

The running plan starts with tuning the AGS for polarization, where we have a dedicated 2 weeks scheduled from the beginning of November. This work will occur during heavy ion fills in RHIC, and the goal is to reach 50% polarization at the RHIC injection energy. The heavy ion to pp changeover is scheduled for Nov. 19-23, and we discussed the work and required time during the presentations. The pp and polarized commissioning is scheduled for the 3 following weeks. Then the first polarized proton collision physics will start. Five weeks are scheduled for polarized collisions at 100 GeV x 100 GeV,  $P_{beam}=50\%$ , luminosity  $4 \times 10^{30} \text{ cm}^{-2}\text{s}^{-1}$ ,  $1.5 \text{ pb}^{-1}$  per week. The agreed split is 1 week/ $1.5 \text{ pb}^{-1}$  transverse spin, 4 weeks/ $6 \text{ pb}^{-1}$  longitudinal spin.

The second transparency addresses the likely luminosity, listing a number of "real world" factors, compared to "design". The conclusion is that  $0.5 \text{ pb}^{-1}/\text{week}$  would be a more achievable (but perhaps still difficult) goal. The split transverse to longitudinal will need to be decided depending on success and circumstances.

The third transparency lists issues. Many of these items were addressed very positively at the meeting. The last item, preparations and plans for the future, will need to be the focus of a future meeting.

G. Bruce  
1 Oct. 2001  
RSC Meeting

## RHIC Spin Plan

- AGS tuning for polarization
  - dedicated 2 weeks Oct/Nov.
- Heavy ion  $\rightarrow$  pp change over
  - 4-5 days Nov. ~~+2-16?~~  
19-23
- pp commissioning
  - 2 weeks
- p $\bar{t}$ p $\bar{t}$  commissioning
  - 1 week
- p $\bar{t}$ p $\bar{t}$  physics at 100 GeV  $\times$  100 GeV,  
 $\rho_{beam} \geq 50\%$ ,  $L = 4 \times 10^{30}$ ,  $1.5 \text{ pb}^{-1}/\text{wk}^*$ 
  - \* { - 1 week /  $1.5 \text{ pb}^{-1}$  transverse pol.  
- 4 weeks /  $6 \text{ pb}^{-1}$  longitudinal pol.  
5 weeks physics for p $\bar{t}$ p $\bar{t}$  and pp

## Notes / Remarks

\* on the  $1.5 \text{ pb}^{-1}/\text{week}$

$$L = 4 \times 10^{30} (8 \times 10^{31}/20) \times 1 \text{ week}$$

$$\times 100\% \text{ availability} = 2.4 \text{ pb}^{-1}$$

- if average  $\bar{L}/\text{fill} = 2 \times 10^{30}$

RHIC up 40%  $\Rightarrow [0.5 \text{ pb}^{-1}/\text{week}]$

$$\begin{aligned}
 & \frac{\text{Bunches}}{\text{Design}} \times \left| \frac{\left( \frac{N_{\text{bunch}}}{N_{\text{spin design}}} \right)^2 \times \frac{\epsilon_{2001}}{\epsilon_{\text{design}}}}{\times \frac{(\beta_{2001}^*)^{-1}}{\beta_{\text{design}}^*} \times \frac{L_{\text{avg}}}{L_{\text{max}}}} \right. \\
 & \quad \left. \times \frac{\frac{1}{4} \times \frac{1}{2} \times \frac{1}{2} \times \frac{1}{2}}{\times \frac{1}{2} \times \frac{1}{2}} \right. \\
 & \quad \left. \Rightarrow \text{lower than spin design by at least factor 32} \right. \\
 & \quad \rightarrow \text{above a factor 40 is assumed}
 \end{aligned}$$

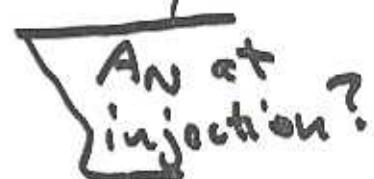
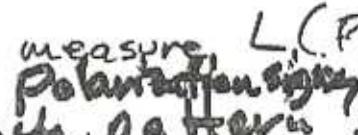
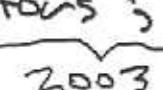
Can be 1  
 if we use  
 120 bunches

\* on split between longitudinal / transverse pol.

- not set in stone

- actual split depends on amount of beam delivered and success in maintaining polarization while turning off one snake at 100 GeV

## More to discuss - today and beyond

- prospects for  $P \geq 50\%$  at RHIC injection
  - AGS, AGS to RHIC (+ source?)
- control of tune/orbit in RHIC
  - prospect to reach requirement?
- prospects/plan for decelerating to carry polarimeter AN to 100 GeV?   
AN at injection?
- prospects/plan for spin flipping?
- experiments - readiness?
  - relative  $L_{++}/L_{+-}$
  - redundancy, ability to measure  $L(P)$ ?   
Polarimeters?
  - local deadtimes; bunch/pattern?
  - rate/trigger capabilities
  - planned measurements!
- theory for planned measurements!
- local polarimeters
- running conditions
  - $\phi$ -polarization bunches?
  - some radial polarization running?
  - $p_p^2 p_p$  test with lower  $N_p$ ?
  - any limit on  $N_p$  from silicon?
- future - beyond 2001/2
  - rotators; CNI for AGS; jet  $\uparrow$   

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