RHIC Machine/Detector Planning Meeting

21 Jun 05

Agenda

(if not covered in time meeting)

- **Experiment issues**
- **Accelerators Issues (Bai)**
- **Other business**

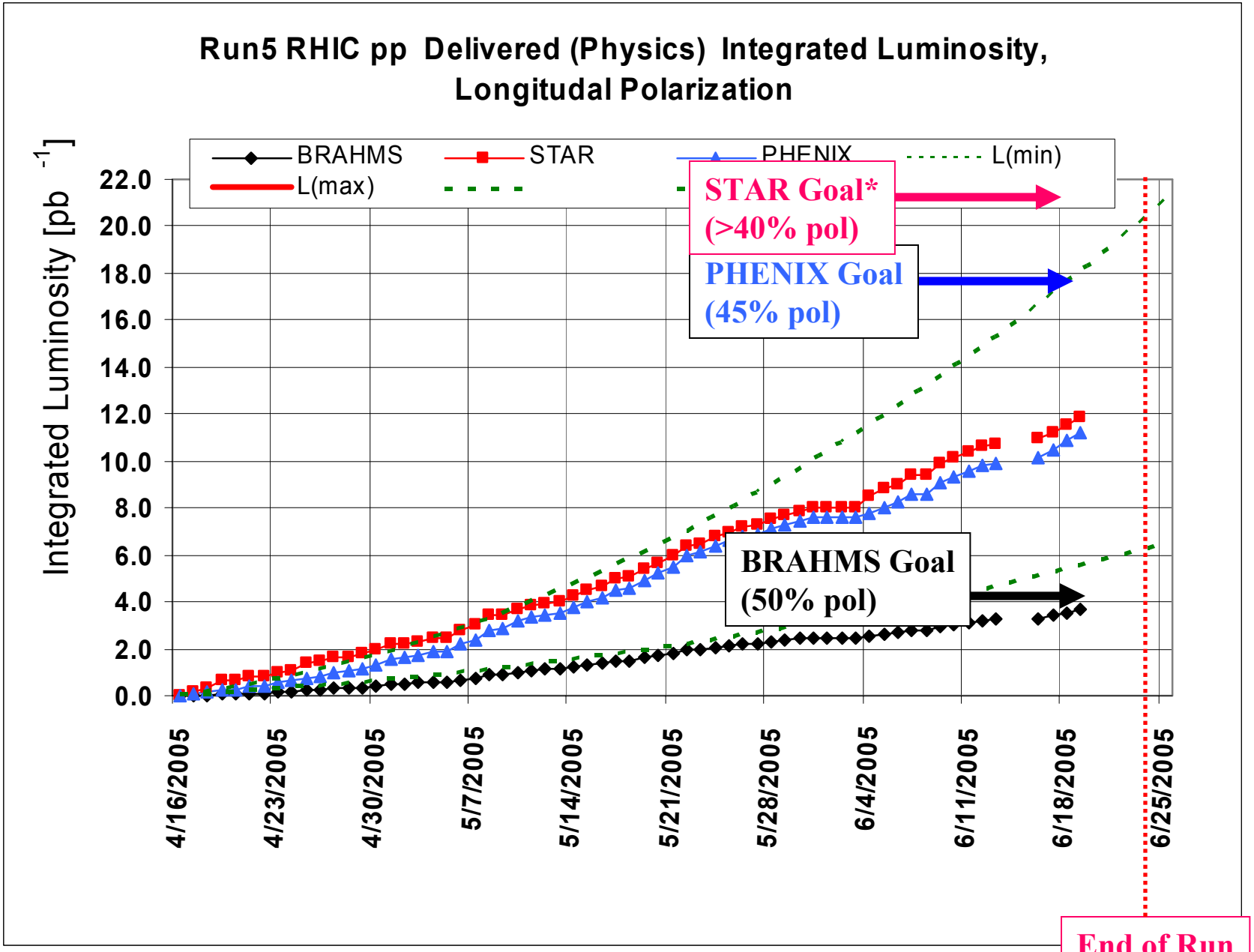
Planning Meeting Web Site: http://www.c-ad.bnl.gov/esfd/RMEM/rhic_planning.htm

RHIC Machine/Detector Planning Meeting

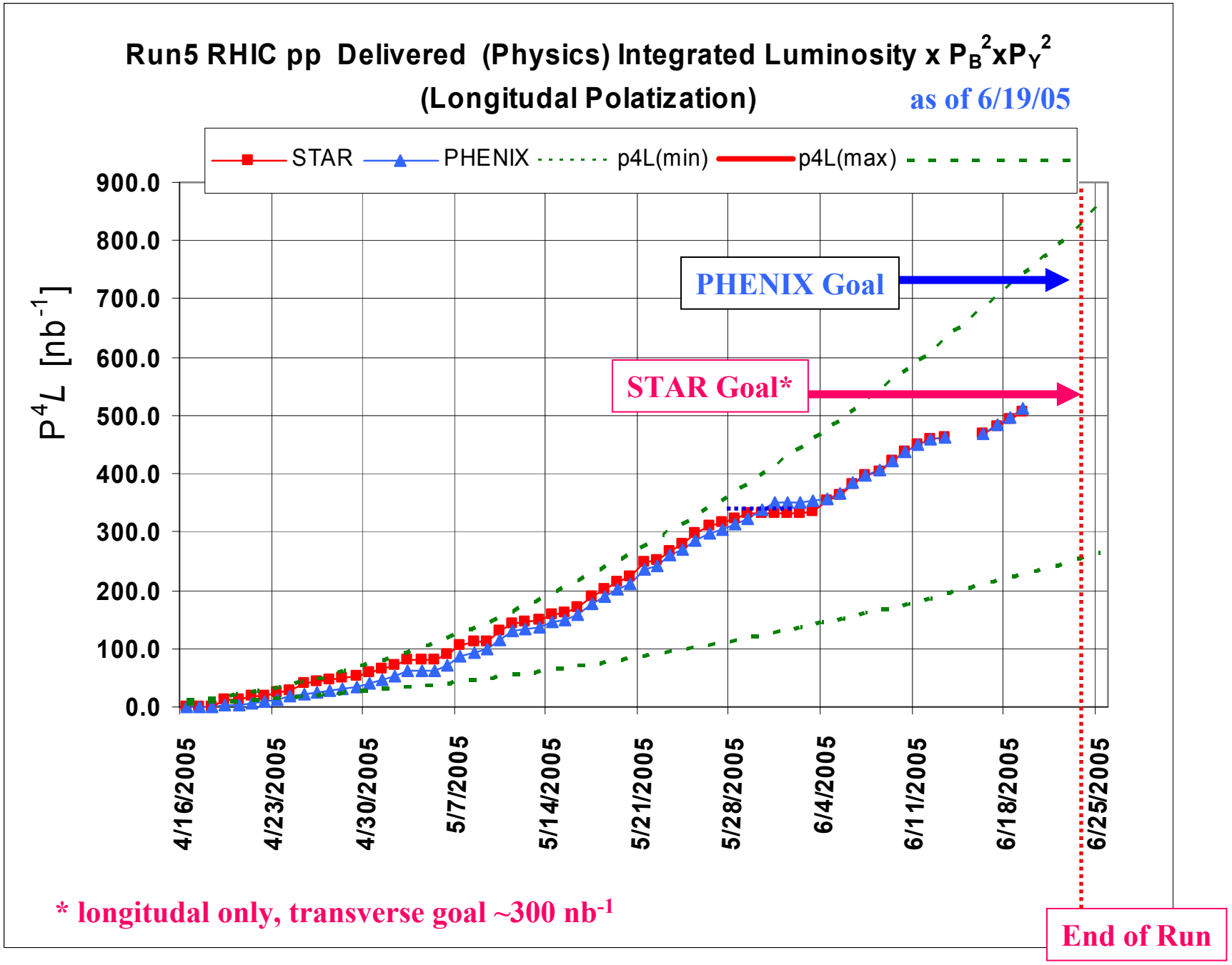
- **Details – as run/planned**

  - ***11 Jan – Physics with Cu-Cu began***
  - ***7 Mar (0800) – end 200 GeV/n Cu-Cu***
  - ***7-9 Mar – Setup 62.4 GeV/n Cu-Cu***
  - ***9-15 Mar - 62.4 GeV/n Cu-Cu Physics***
  - ***10 March – Physics begins***
  - ***15 Mar – 8 hours at injection energy***
  - ***15-22 (1400) Mar - 62.4 GeV/n Cu-Cu Physics***
  - ***22 (1400)-24 (0800) March Cu-Cu Physics at RHIC Injection***
  - **24 Mar (0800) – End of 10.3 week Cu-Cu run, 8 hr maintenance**
  - ***24-30 Mar – begin 3 week pp setup***
  - **30 Mar - 1 Apr 05 Cold Snake/Jet Installation/CNI etc**
  - ***1-16 Apr – complete 3 week pp setup*** *(7 April, overnight stores for experiments started)*
  - ***17 Apr – Begin 10.0 week pp Physics run***
  - ***31 May – Begin 410 GeV pp setup***
  - ***2-3 June – 2 shifts Physics at 410 GeV***
  - ***3 June – Back to 200 GeV pp***
  - **25 Jun – end pp run (midnight 24 June), RHIC Run 5 ends**
  - **30 Jun – Cryo switch to LN_2 complete, *32.0* weeks of RHIC cryo operation ends**

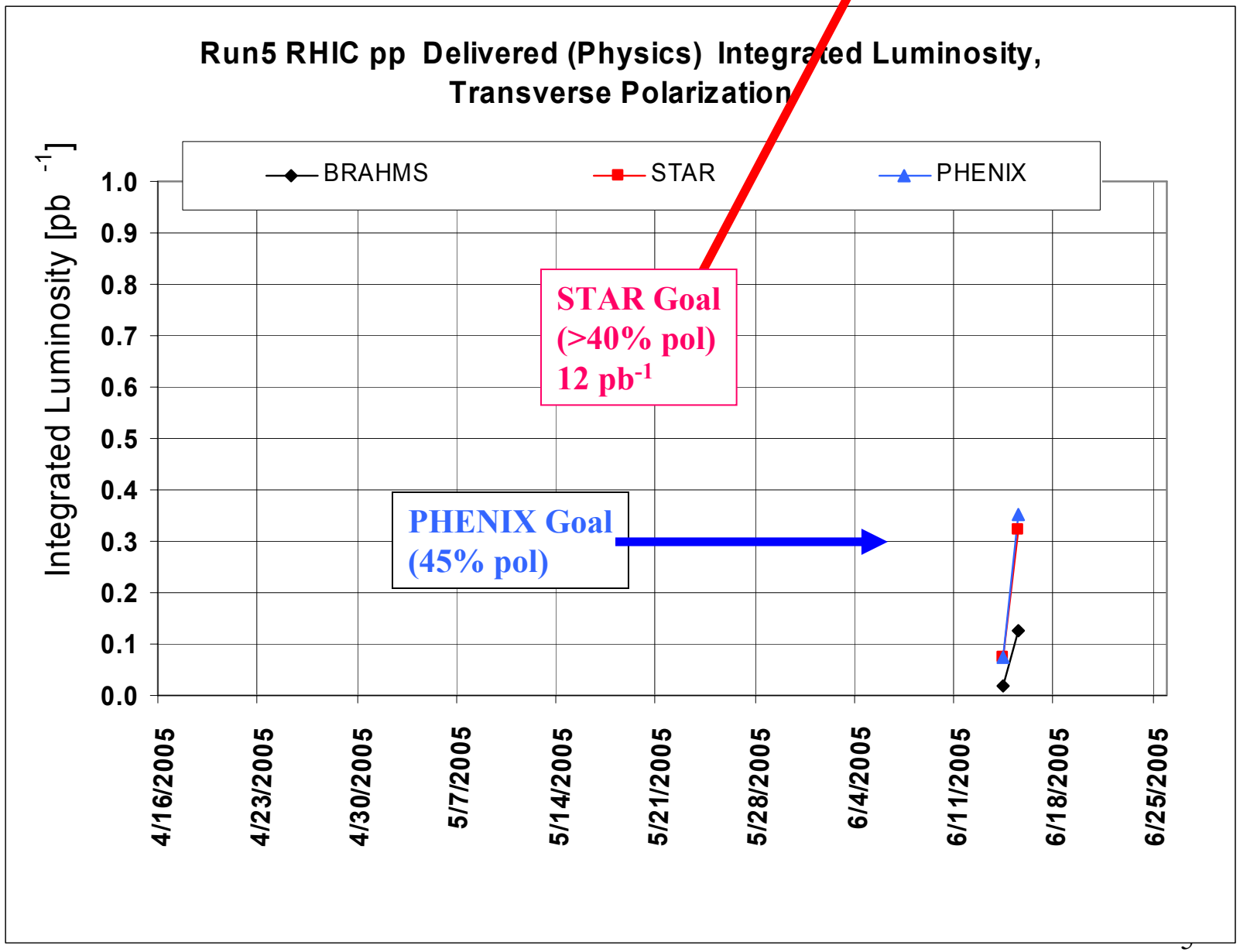
as of 6/19/05



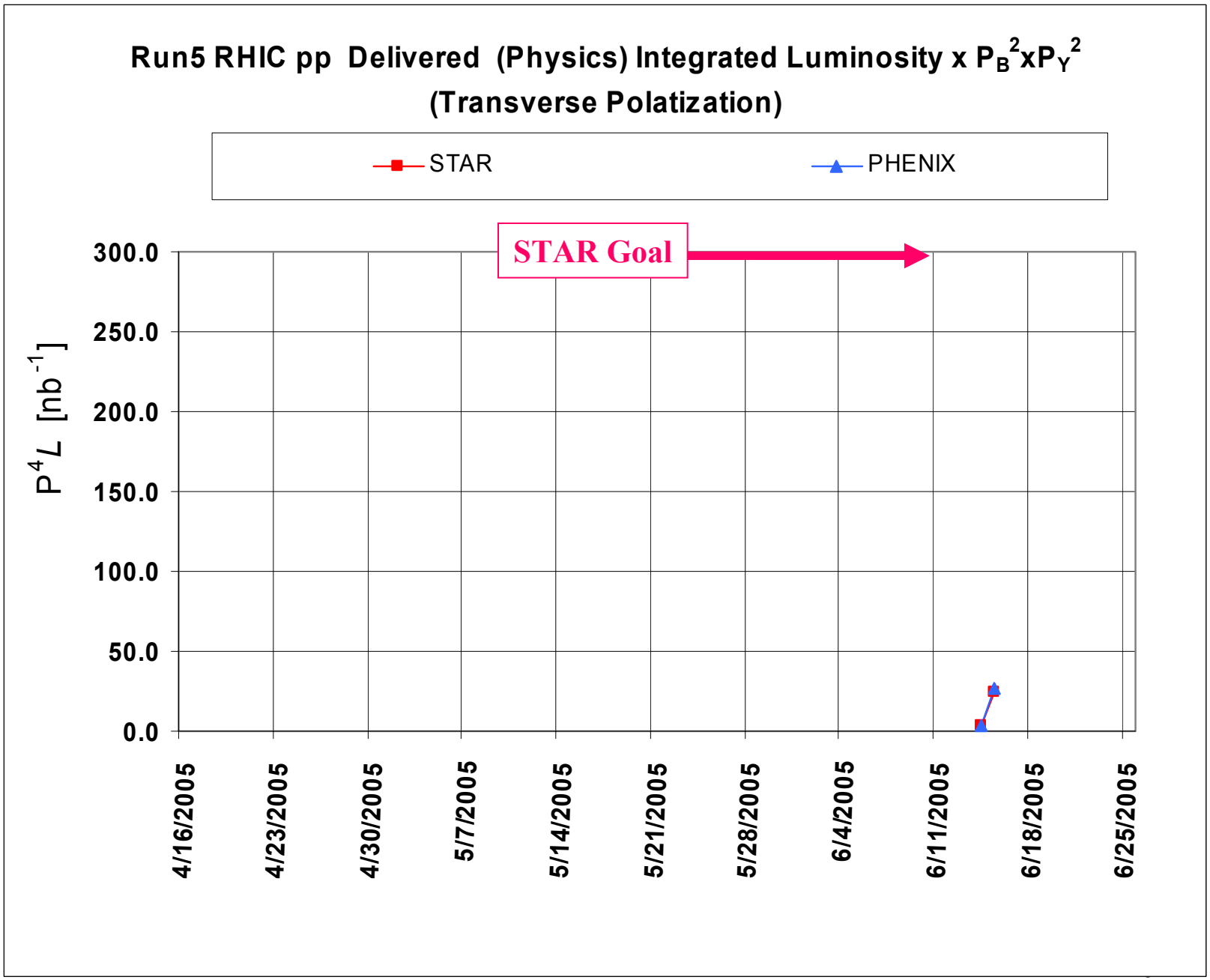
* longitudal polarization only, transverse goal 12 pb^{-1}


Run5 RHIC pp Delivered (Physics) Integrated Luminosity x $P_B^2 x P_Y^2$
(Longitudal Polatization)
as of 6/19/05
STAR
PHENIX
p4L(min)
p4L(max)
P^4L [nb^{-1}]
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.0
PHENIX Goal
STAR Goal*
4/16/2005
4/23/2005
4/30/2005
5/7/2005
5/14/2005
5/21/2005
5/28/2005
6/4/2005
6/11/2005
6/18/2005
6/25/2005
* longitudal only, transverse goal ~300 nb^{-1}
End of Run

as of 6/19/05

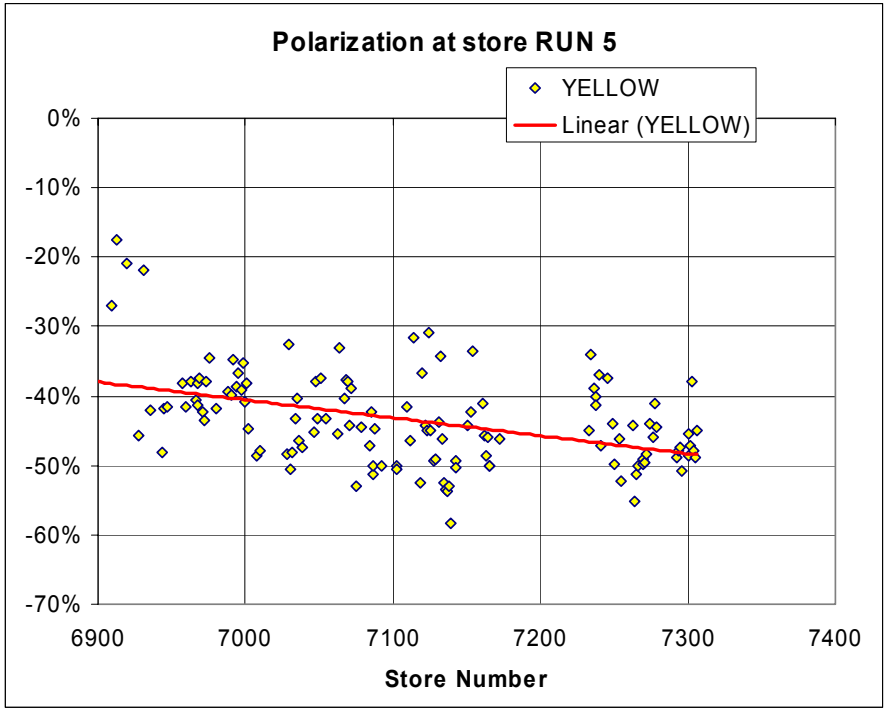

Run5 RHIC pp Delivered (Physics) Integrated Luminosity,
Transverse Polarization
Integrated Luminosity [pb -1]
BRAHMS
STAR
PHENIX
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
4/16/2005
4/23/2005
4/30/2005
5/7/2005
5/14/2005
5/21/2005
5/28/2005
6/4/2005
6/11/2005
6/18/2005
6/25/2005
STAR Goal
(>40% pol)
12 pb-1
PHENIX Goal
(45% pol)

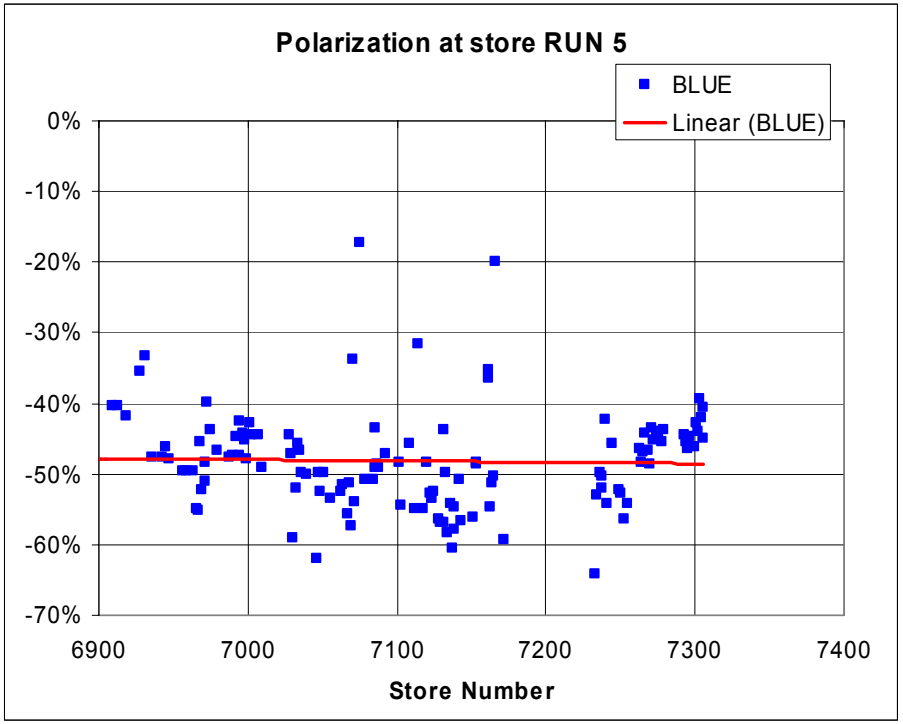
as of 6/19/05


Run5 RHIC pp Delivered (Physics) Integrated Luminosity x $P_B^2 x P_Y^2$
(Transverse Polatization)
STAR
PHENIX
STAR Goal
P^4L [nb^{-1}]
300.0
250.0
200.0
150.0
100.0
50.0
0.0
4/16/2005
4/23/2005
4/30/2005
5/7/2005
5/14/2005
5/21/2005
5/28/2005
6/4/2005
6/11/2005
6/18/2005
6/25/2005

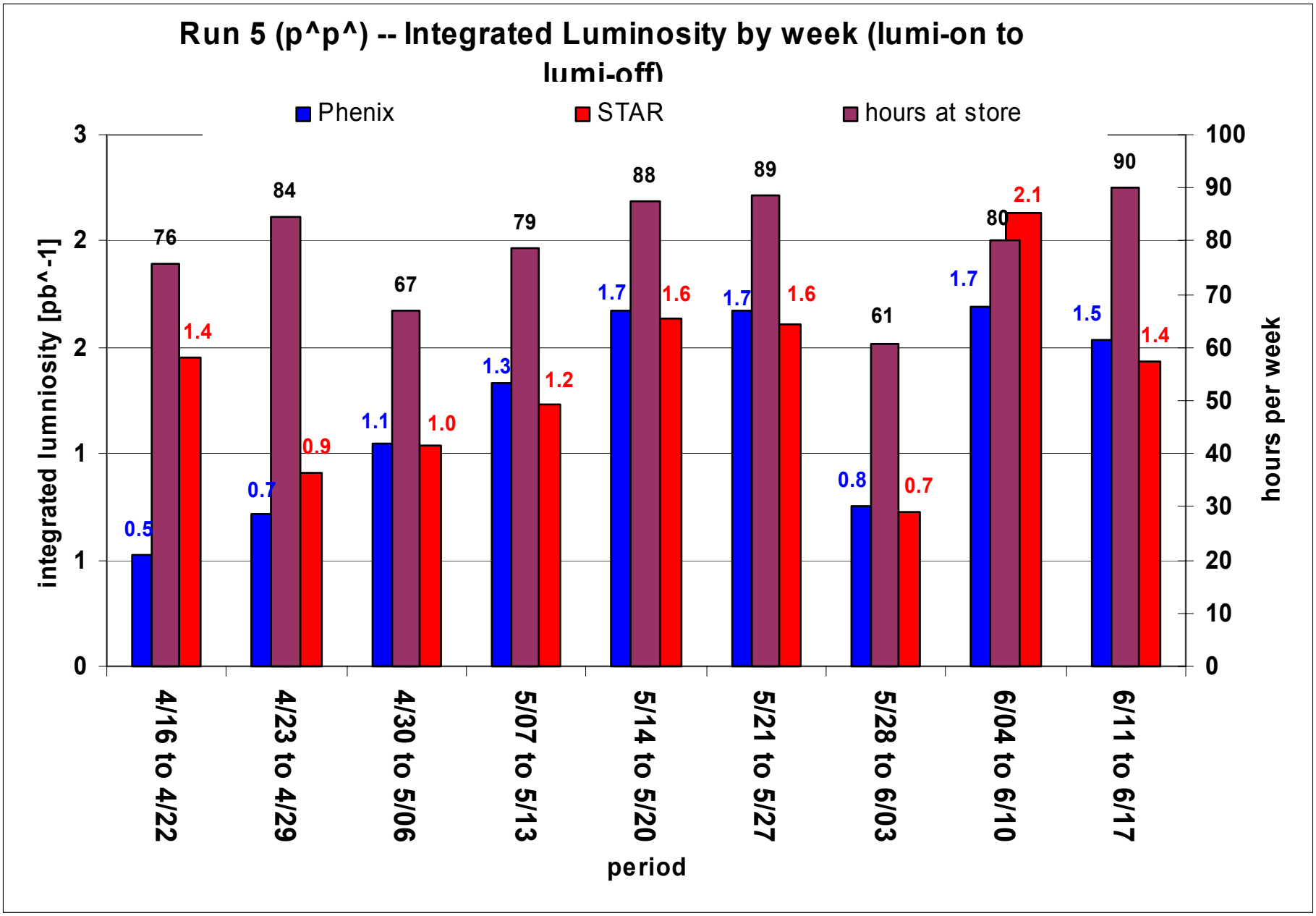
as of 6/19/05

RHIC Run-5 pp 100x100 GeV





RHIC Machine/Detector Planning Meeting



RHIC Machine/Detector Planning Meeting

Archive

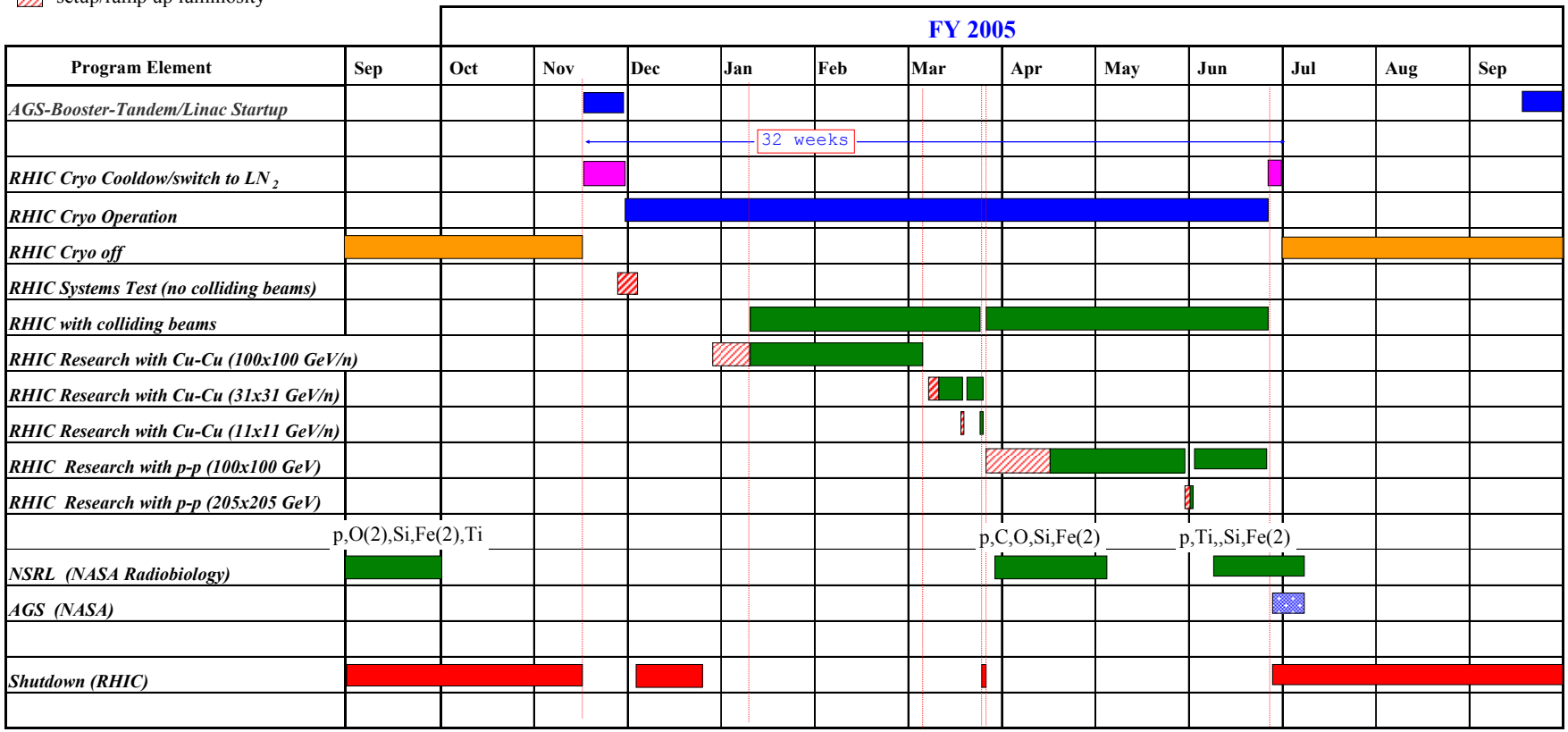
http://www.c-ad.bnl.gov/esfd

C-A Operations-FY05

14 Jun 05

Schedule - subject to change

pending funding
schedule to be determined
setup/ramp up luminosity



http://www.c-ad.bnl.gov/esfd

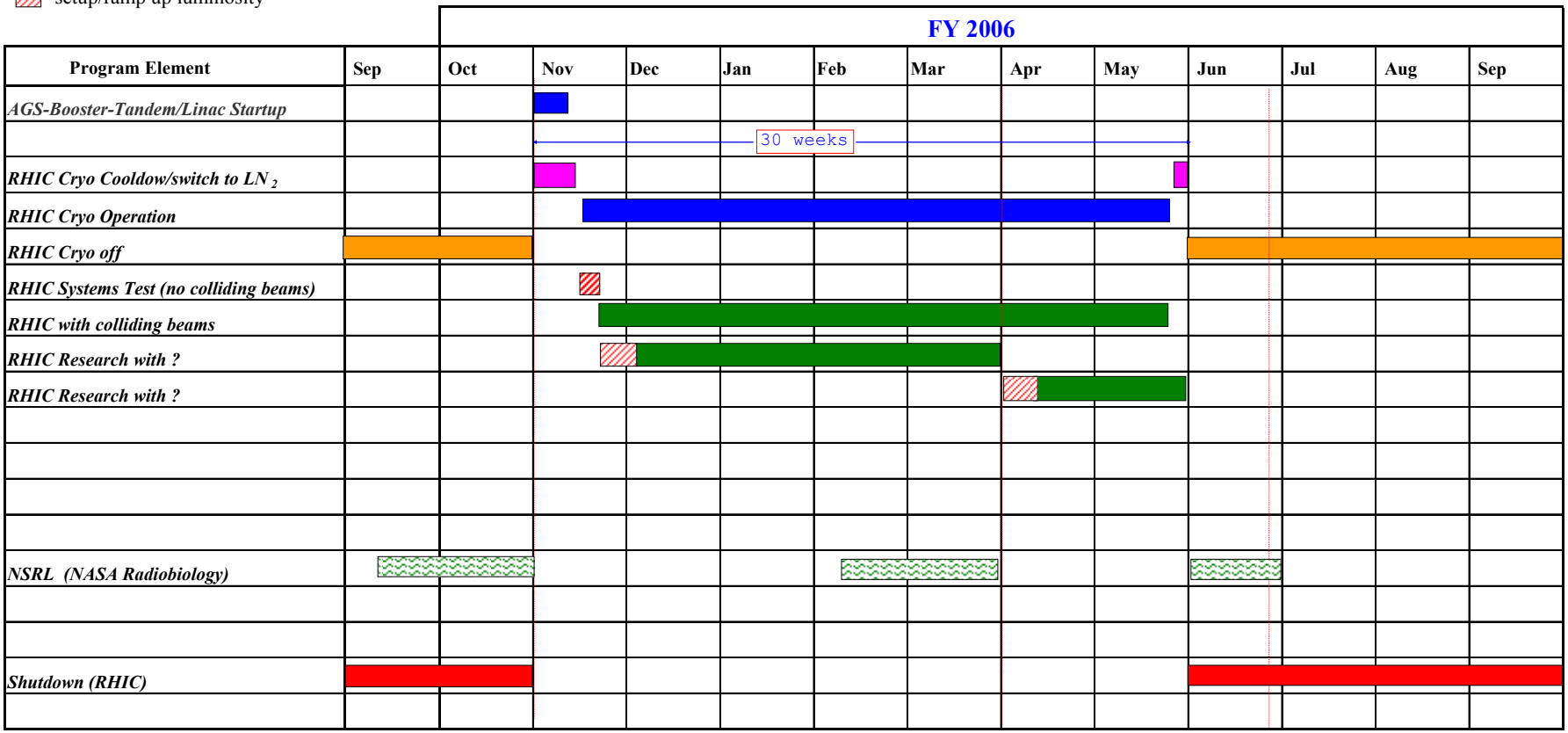
DRAFT - Not published

C-A Operations-FY06

14 Jun 05

Schedule - subject to change

pending funding
schedule to be determined
setup/ramp up luminosity



http://www.c-ad.bnl.gov/estd

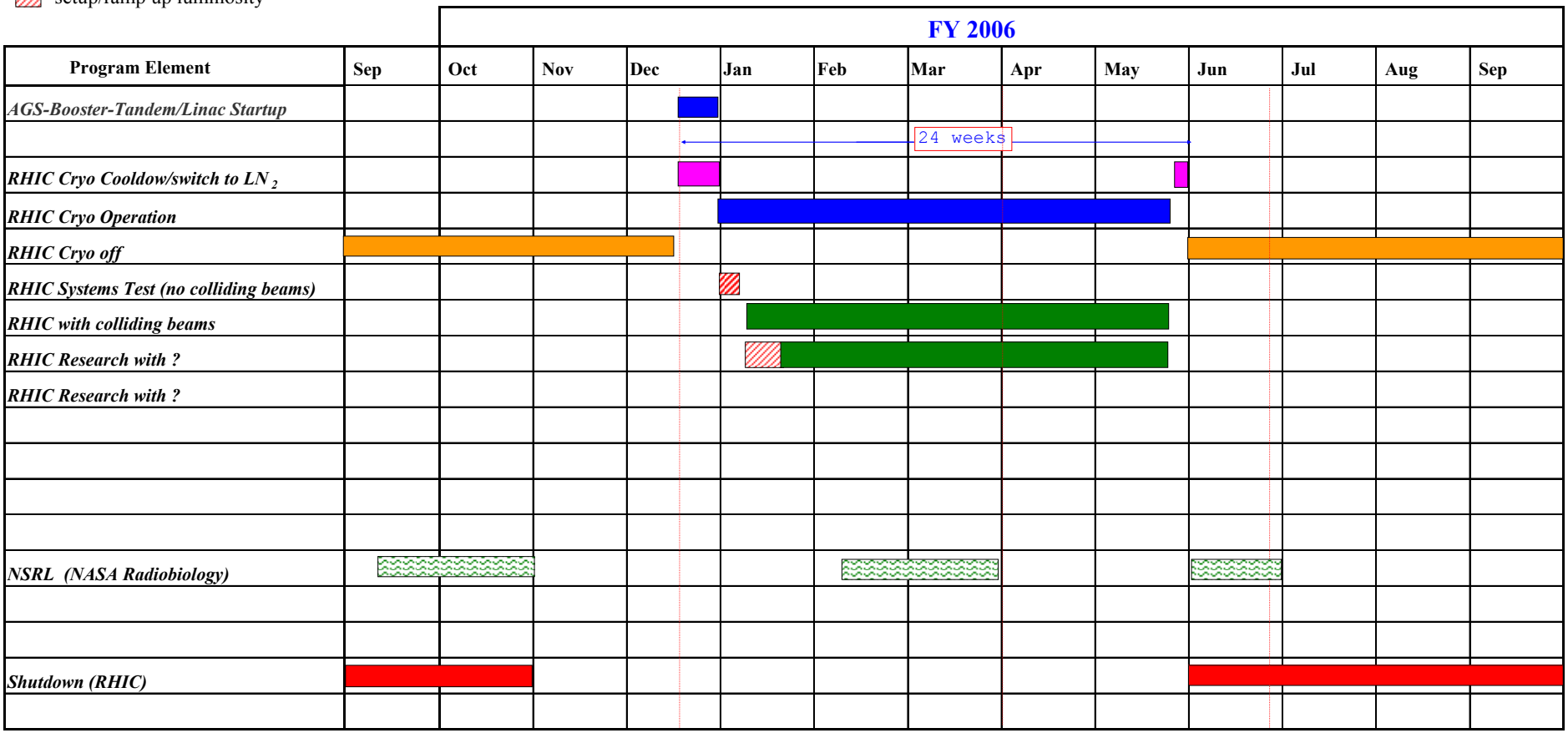
DRAFT - Not published

C-A Operations-FY06

14 Jun 05

Schedule - subject to change

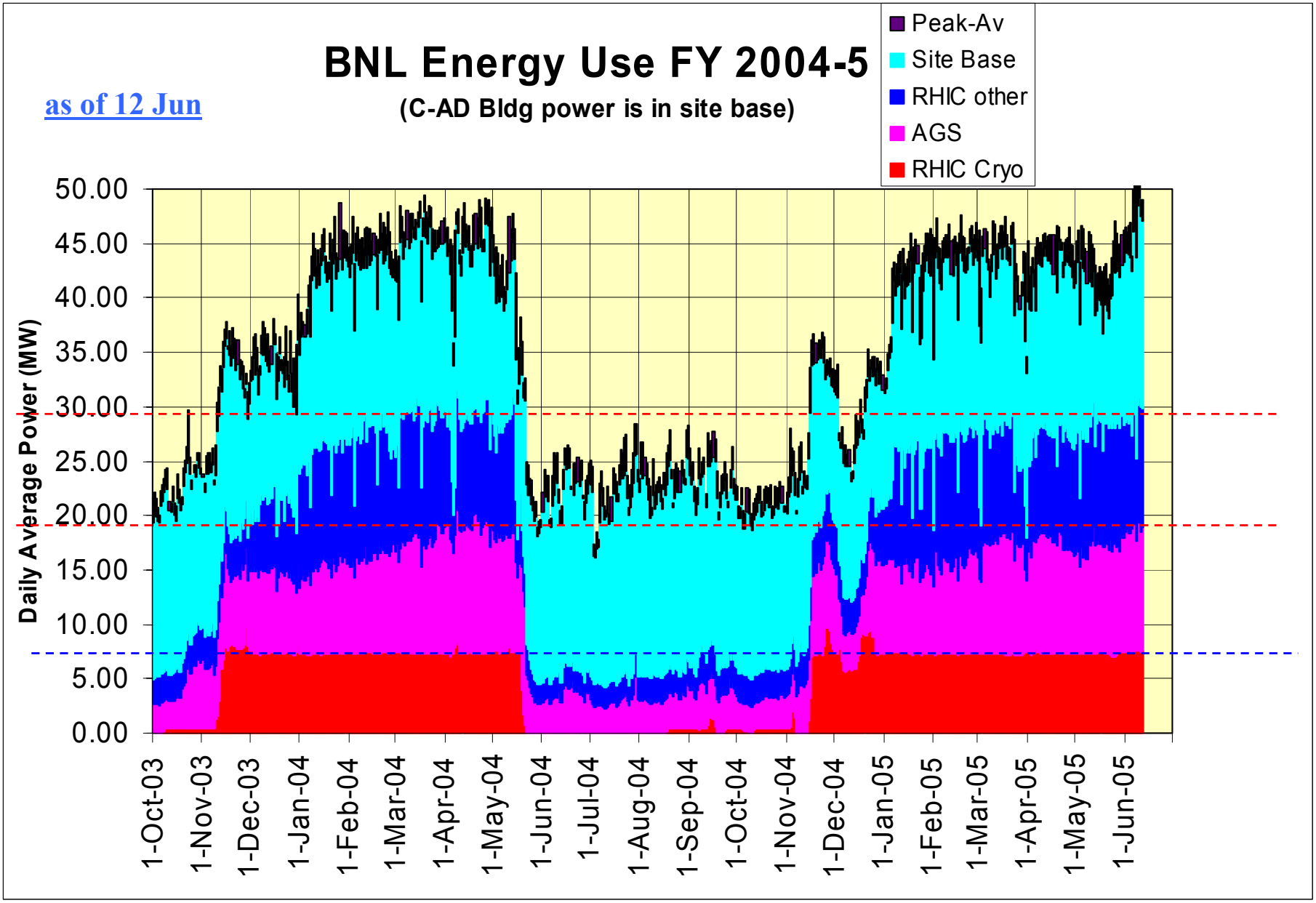
pending funding
schedule to be determined
setup/ramp up luminosity



BNL Energy Use FY 2004-5

(C-AD Bldg power is in site base)

as of 12 Jun



RHIC Machine/Detector Planning Meeting

- ***RHIC Run5 As Run/Plan***

  - **18 Nov 04 – Cool down begins**
  - **23 Nov 04 – Blue Ring Cold**
  - **28 Nov 04 – Yellow Cold**
  - **29 Nov 04 – Short in D6-D8 dipoles Yellow Ring, schedule delay**
  - **3 Dec 04 – quad bus-bus short in sector 12, shutdown to repair**
  - **27 Dec 04 – short problem resolved, rings at 4 degrees again**
  - **27 Dec 04 - "2 week" RHIC setup with beam began**
  - **28-29 Dec 04 – found & fixed aperture problem in Yellow Ring (Al foil)**
  - ***5 Jan 05 – "2 week" ramp-up with colliding beams began***

Experiment Goals RHIC Run 5, 100x100 GeV pp

(6/21/05 update)

- **BRAHMS**
  - Began physics 17 April
  - Luminosity Goal 2 pb^{-1} transverse polarized (50%) recorded
    - Translates to , 4 pb^{-1} transverse polarized delivered
  - $P_B^2 \boldsymbol{L}$ (FOM) goal with 50% polarization = 500 nb^{-1} recorded
    - Translates to , 1000 nb^{-1} transverse polarized delivered

- **PHENIX**
  - Began min-bias physics 17 April, main physics 19 April
  - Efficiencies (~actual):
    - Vertex cut = 0.43
    - PHENIX "uptime" = 0.72
  - Luminosity Goal (Longitudal) 5.5 pb^{-1}recorded,
    - Translates to 5.5/(.72*.43)=17.8 pb^{-1} delivered
  - Luminosity Goal (Transverse) 0.1 pb^{-1}recorded,
    - Translates to 0.1/(.72*.43)=0.3 pb^{-1} delivered
  - $P_B^2 P_Y^2 \boldsymbol{L}$ (FOM) longitudal goal with 45% polarization = 226 nb^{-1} recorded
    - Translates to: $P_B^2 P_Y^2 \boldsymbol{L}$ goal 226 nb^{-1}/(0.72*0.43) = 730 nb^{-1} delivered

- **STAR**
  - Began physics 17 April
  - Goal ~ 20 Mevts min-bias (~70 hrs)
  - Goal ~ 7 pb^{-1} longitudal polarized (>40%) collisions, 21 pb^{-1} delivered (useable)
    - $P_B^2 P_Y^2 L$ *Goal* = 180 nb^{-1} recorded, 537 nb^{-1} delivered
  - Goal ~ 4 pb^{-1} transverse polarized (>40%) collisions, 12 pb^{-1} delivered (useable)
    - $P_B^2 P_Y^2 L$ *Goal* = 100 nb^{-1} recorded, 300 nb^{-1} delivered

Experiment Goals RHIC Run 5, 100x100 GeV/n CuCu, Summary of Results (3/23/05 update)

- **BRAHMS**
  - Soft physics goal 0.8 nb^{-1} recorded, achieved 0.8 nb^{-1} → 100% of goal
  - High-Pt goal 2.4 nb^{-1} recorded, achieved 1.75 nb^{-1} → 73% of goal
- **PHENIX**
  - Integrated recorded luminosity goal (live BBCLL1) 2.9 nb^{-1}, achieved 3.06 nb^{-1} → 105% of goal
- **PHOBOS**
  - Goal 1000M events to tape, achieved 500M → 50% of minimum goal
  - Minimum Goal 400M events to tape, achieved 500M → 125% of minimum goal
- **STAR**
  - Min bias, Goal 80M events, recorded 64.5M events → 80% of goal
  - High Pt Trigger (BEMC HT18), Goal to sample 1-2 nb^{-1}, recorded >1 nb^{-1} → 100% of goal

Experiment Goals RHIC Run 5, 31.2 x31.2 GeV/n and 11.2x11.2 GeV/n CuCu and Final Results (3/30/05)

- **BRAHMS**
  - 62 GeV, Integrated Recorded Luminosity Goal 90 μb^{-1}
    Actual recorded luminosity 120 μb^{-1} (133% of goal)
  - 22 GeV, Goal 1.5M FFS triggers recorded
    Actual recorded 1.9M triggers (126% of goal)

- **PHENIX**
  - 62 GeV, Integrated Delivered Luminosity Goal = 250 μb^{-1}
    Integrated Recorded Luminosity Goal 92 μb^{-1}
    Actual recorded luminosity 190 μb^{-1} (206% of goal)
  - 22 GeV, ~20M recorded events
    Actual recorded 23.8M events (119% of goal)

- **PHOBOS**
  - 62 GeV, Goal 250M events to tape, minimum Goal 100M events
    Actual recorded 115M events (115% of minimum goal)
  - 22 GeV, Goal 8M events to tape
    Actual recorded 20M events (250% of goal)

- **STAR**
  - 62 GeV, Min bias, Goal >20M events to tape
    Actual recorded 27.3M events (136% of goal)
  - 22 GeV, Min bias, Goal >1M events to tape
    Actual recorded 3.85M events (385% of goal)

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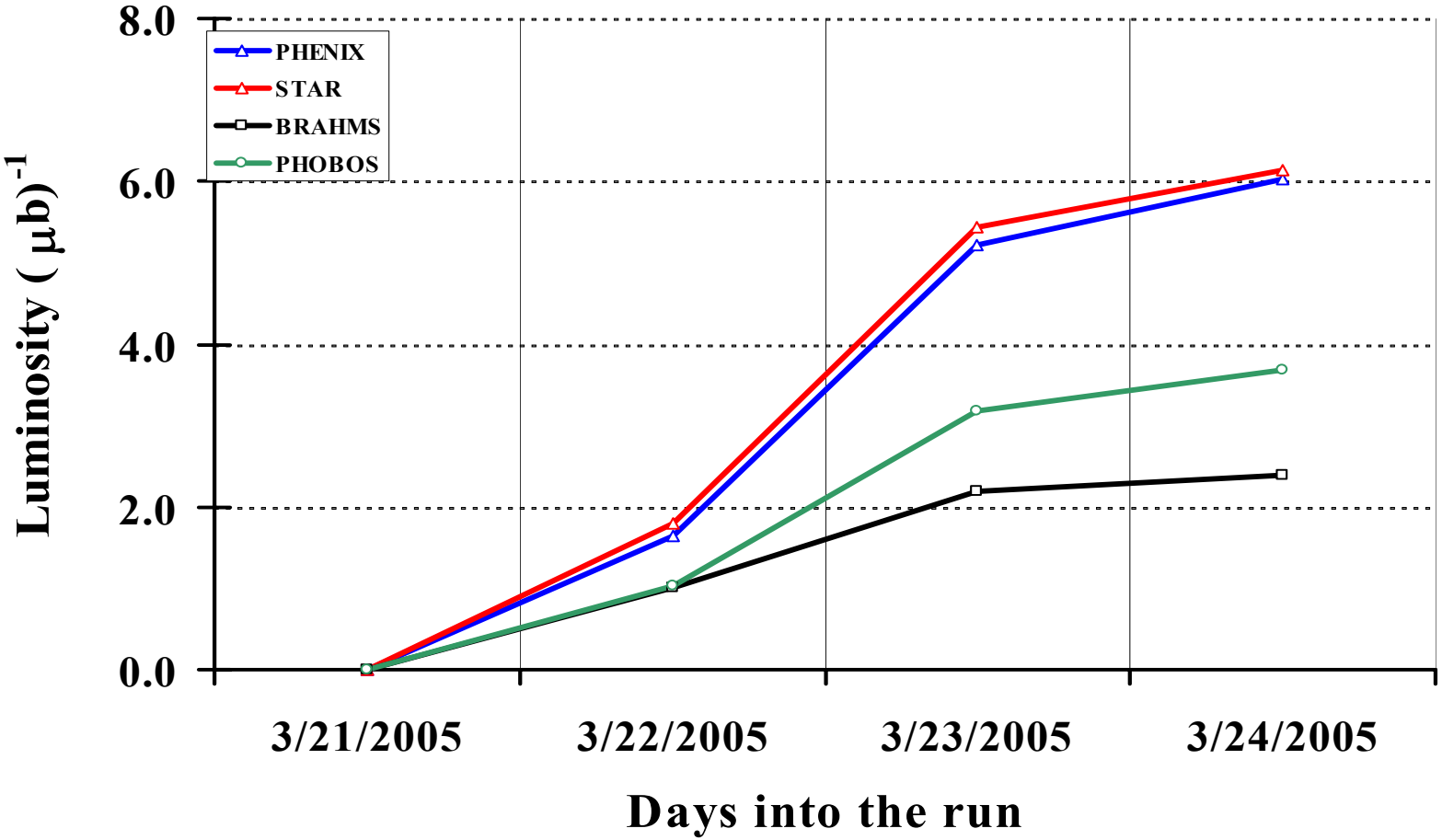
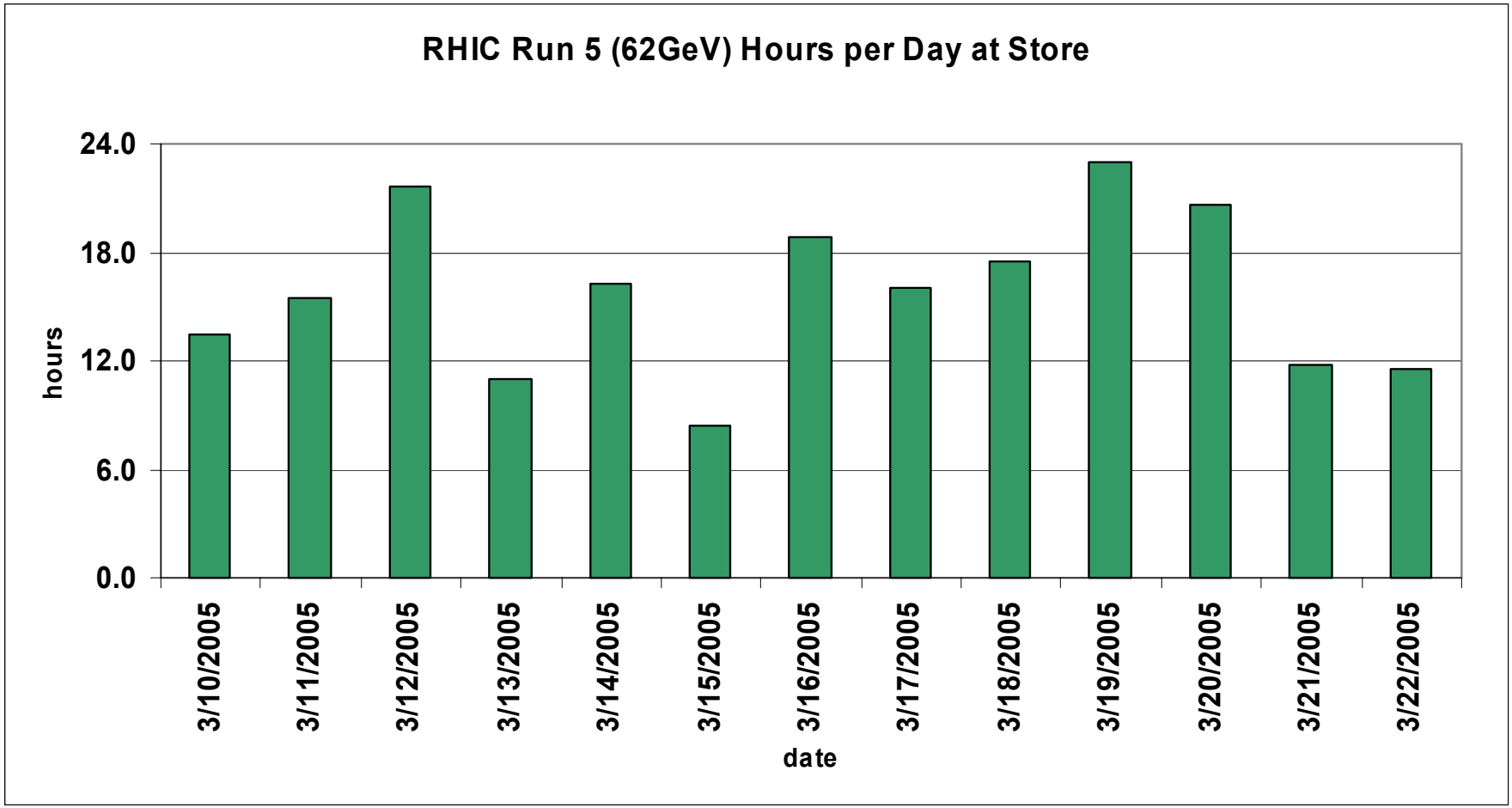
17 November 2004

PAC Recommendations (very short summary):

- 8-10 week pp run should have highest priority
- Cu-Cu run should accumulate an integrated delivered luminosity of at least 7 nb^{-1} at $\sqrt{s}$ = 200 GeV
- Cu-Cu at $\sqrt{s}$ = 62.4 GeV and 1 day at injection is advisable if above goals are met
- 1-2 day pp (unpolarized) run at $\sqrt{s}$ = 400-500 GeV desirable

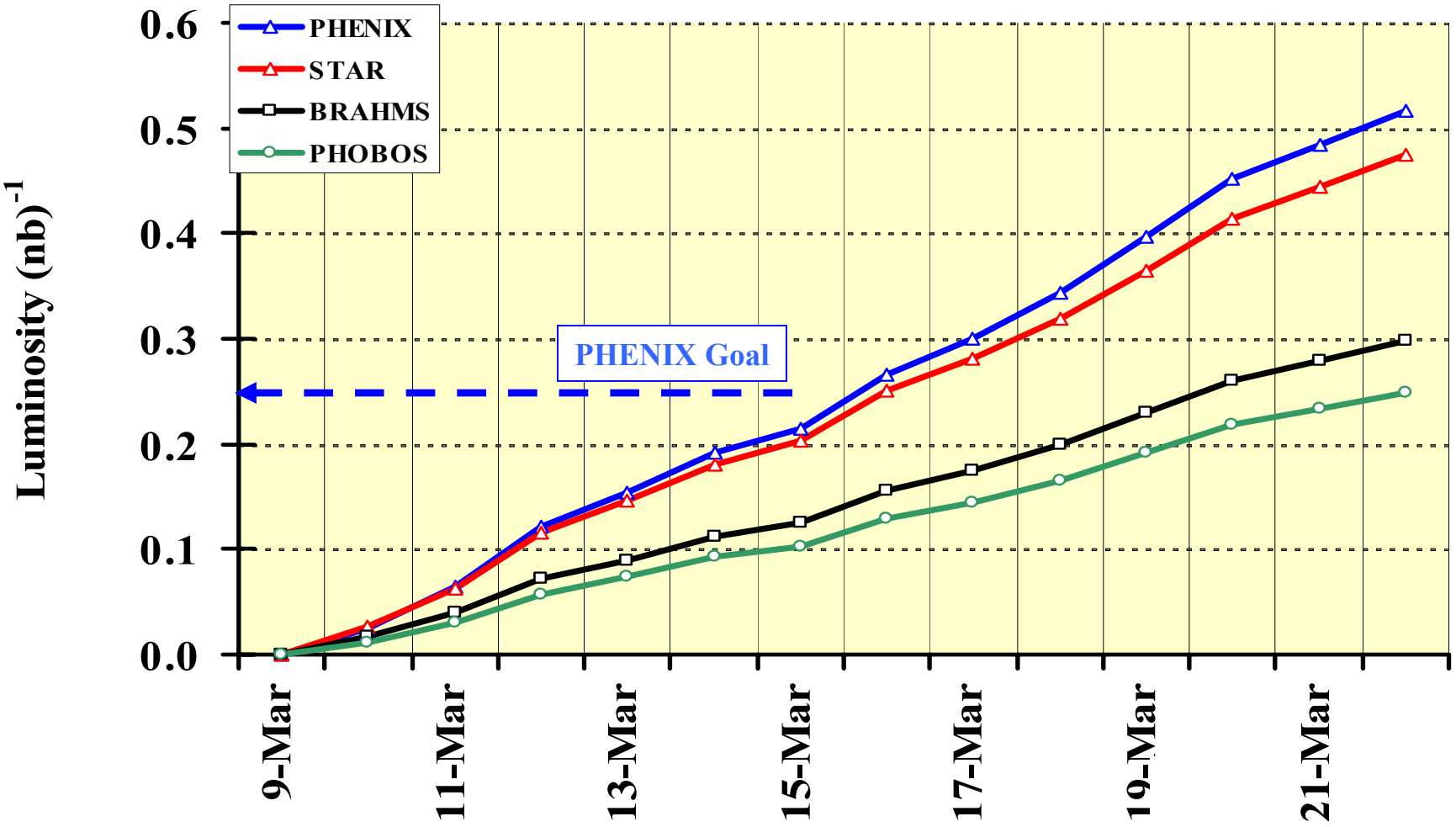
RHIC Run 5 (22 GeV) Final Delivered Cu-Cu Luminosity



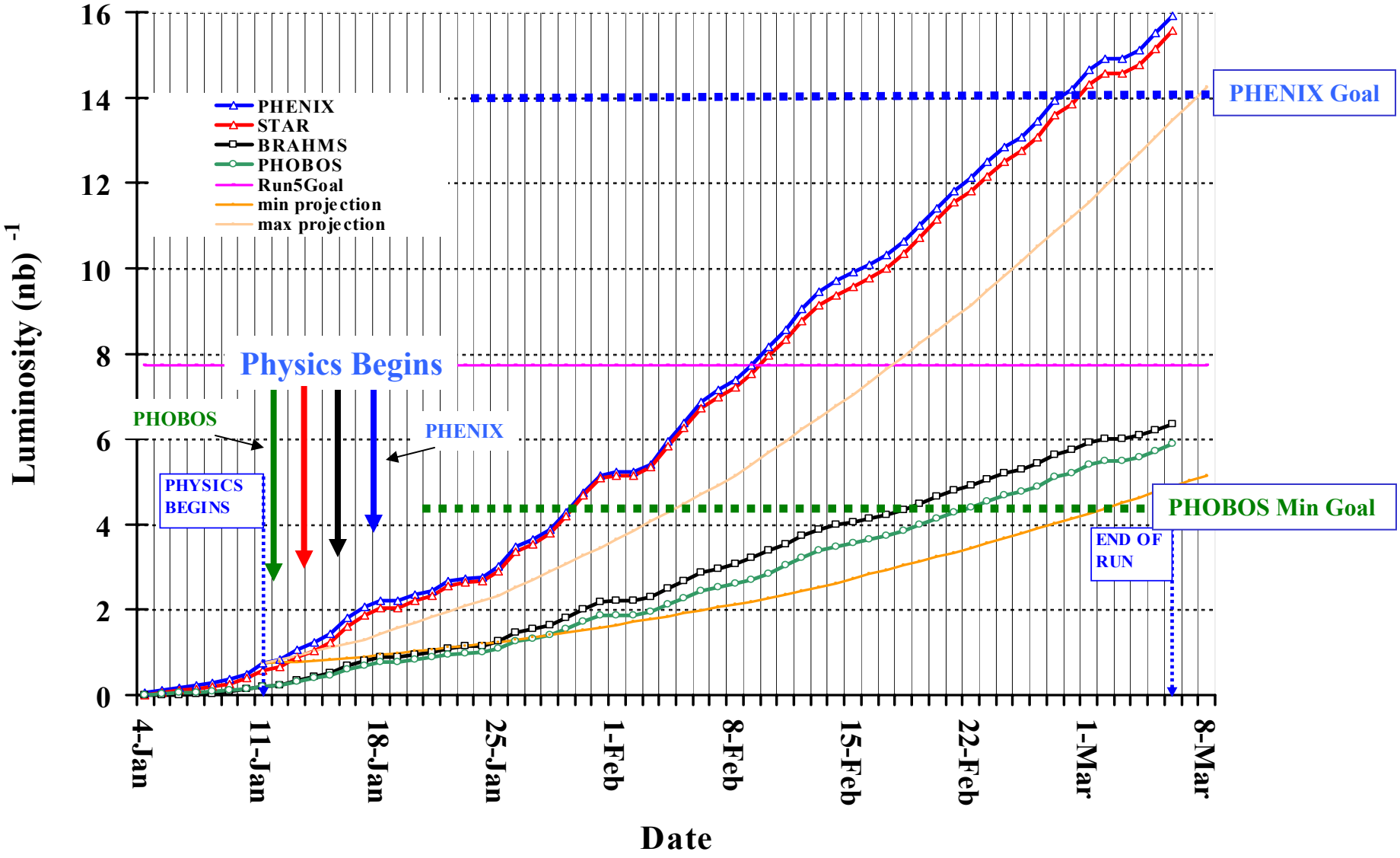


Total = 205.5 hours
0130 10 Mar – 1330 22 Mar = 300 clock hours
68.5% or 115 hrs/week average

RHIC Run 5 (62 GeV) Final Delivered Cu-Cu Luminosity



RHIC Run 5 Final Delivered 100x100 GeV/n Cu-Cu Luminosity



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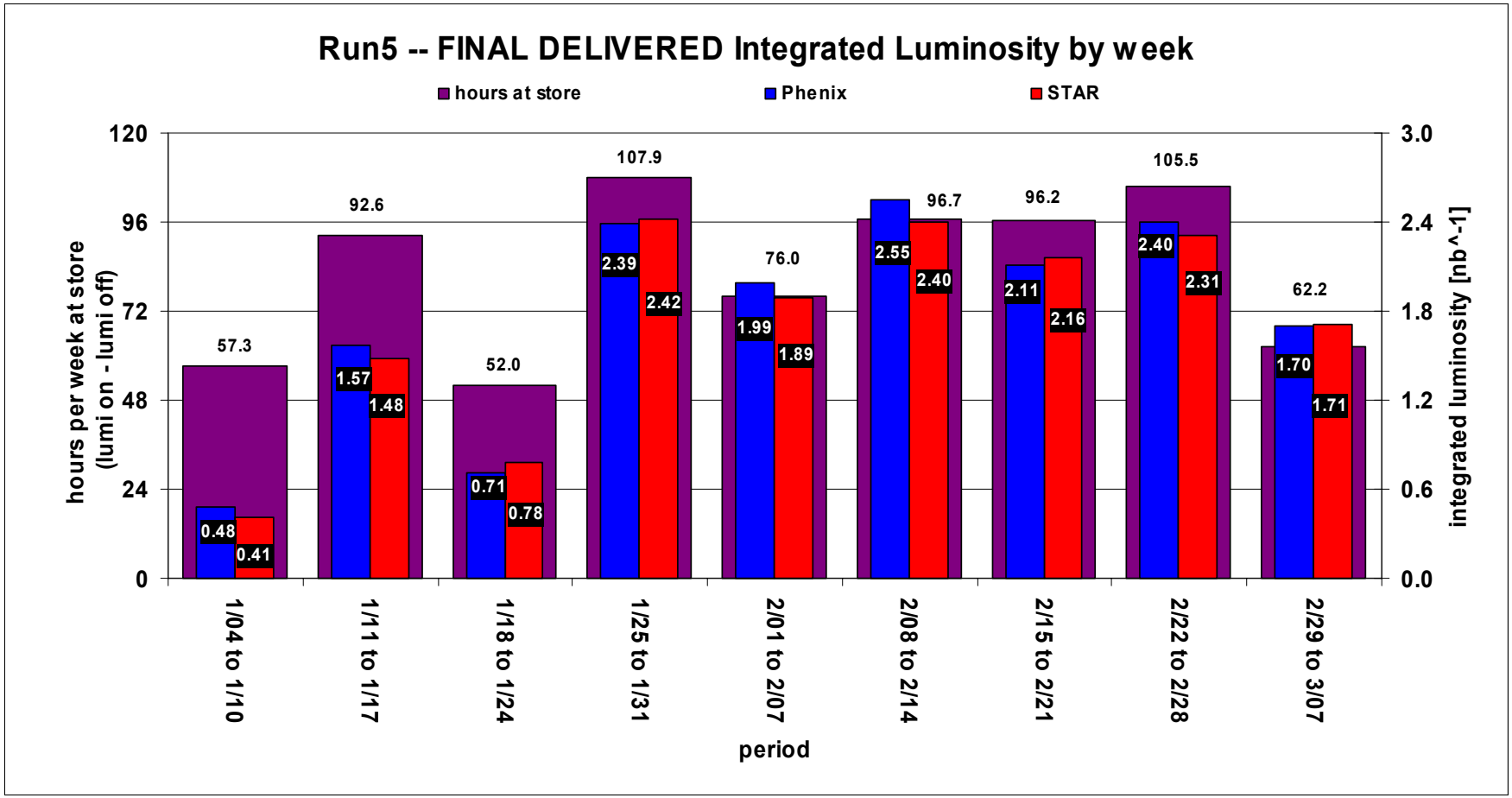

RHIC Machine/Detector Planning Meeting

17 November 2004

Purpose of this meeting:

- To address issues and priorities relating to the optimization of physics output from RHIC experiments.

- To discuss and promulgate policy (when needed).