RHIC Machine/Detector Planning Meeting

11 April 06

Agenda

- **Proposal for developing low energy beams in RHIC– (Satogata)**
- **Scheduling Physicist (Brown) - Scheduling issues**
- **Experiment Progress/Issues - STAR, PHENIX, (BRAHMS)**
- **Jet Target Progress/issues - (Makdisi)**
- **Machine Issues - (Ptitsyn)**
- **AGS beam polarization progress report/polarimeter status – (Huang)**
- **RHIC Polarimeters (Bravar) – issues**
- **RHIC Beam Experiments – (Pilat)**
- **RCF (Throwe) – issues (Tom's away – no issues to report)**

Planning Meeting Web Site: http://www.c-ad.bnl.gov/esfd/RMEM_06/rhic_planning.htm

The 14.5 week pp "physics" plan, Run6

$\sqrt{s}$ = 200 GeV/c (1st 11 weeks)

$\sqrt{s}$ = 62.4 GeV/c (next 2 weeks)

- 2 weeks physics
  - STAR Transverse
  - PHENIX Transverse
  - BRAHMS Transverse

$\sqrt{s}$ = 500 GeV/c (last 1 week)

- Machine Development

- ~~**0.5 week contingency, use to be determined**~~

RHIC Run 6 Original Plan

- 1 Feb – Begin cool-down
- 8 Mar –Physics Mode for machine and experiments (5 weeks into run)
- 8 Mar – begin 11 weeks of $\sqrt{s}$=200 GeV pp
- 24 May – end 11 weeks $\sqrt{s}$=200 GeV pp
- 24 May begin setup $\sqrt{s}$=62 GeV pp
- 7 Jun – end 2 week $\sqrt{s}$=62 GeV pp
- 7 Jun – begin 1 week $\sqrt{s}$=500 GeV pp development
- 14-18 Jun – Contingency (end 14.5 weeks "Physics")
- 18 Jun – begin cyro warm-up
- 21 Jun – RHIC Cryo warm-up complete, end 20.0 weeks of cryo operation

RHIC Run 6 as run/revised plan* 4/11/06

- 1 Feb – Cool-down begins
- 7 Feb – 1st beam in blue ring
- 12 Feb – 1st beam in yellow beam
- 5 Mar – Machine Physics Mode declared (4.6 weeks into run)
- 8 Mar – **PHENIX** in Physics Mode – radial pol (5 weeks into run – on schedule)
- 12 Mar – **STAR** in Physics Mode – long pol (5.6 weeks into run)
- 12 Mar – begin 11.0 weeks of $\sqrt{s}$=200 GeV pp (0.6 weeks behind schedule)
- 6 Apr – **STAR** switch to trans pol
- 13 Apr – **PHENIX** switch to long pol (estimate)
- 25 Apr – **STAR** switch to long pol (estimate)
- 28 May – end 11.0 weeks $\sqrt{s}$=200 GeV pp
- 28 May begin setup $\sqrt{s}$=62 GeV pp – add **BRAHMS**
- 11 Jun – end 2 week $\sqrt{s}$=62 GeV pp
- 11 Jun – begin 1 week $\sqrt{s}$=500 GeV pp development
- 18 Jun – End RHIC Run 6 Physics
- 21 Jun – RHIC Cryo switch to LN2 complete, end 20.0 weeks of cryo operation

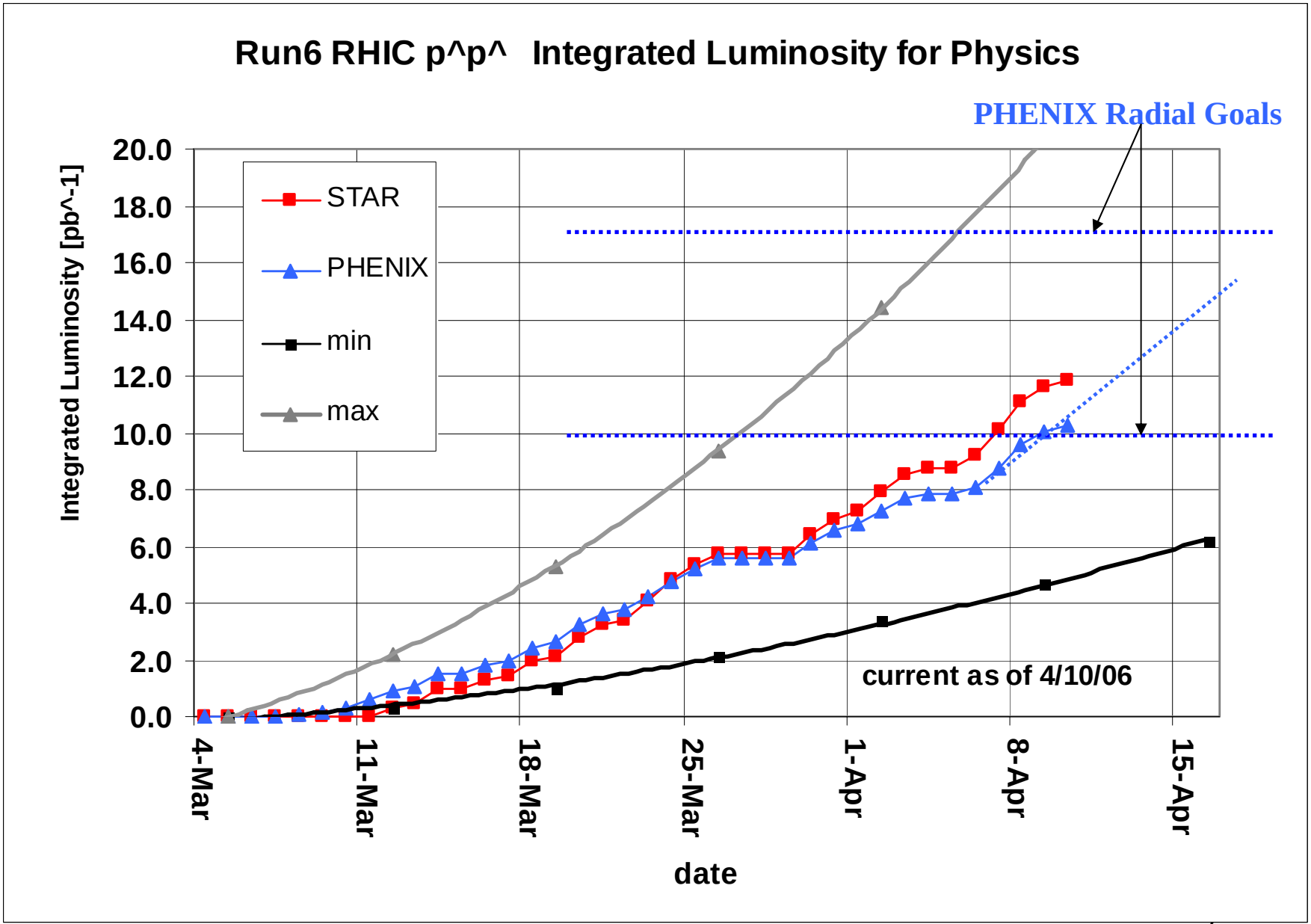
<u>Proposed addition to above</u>

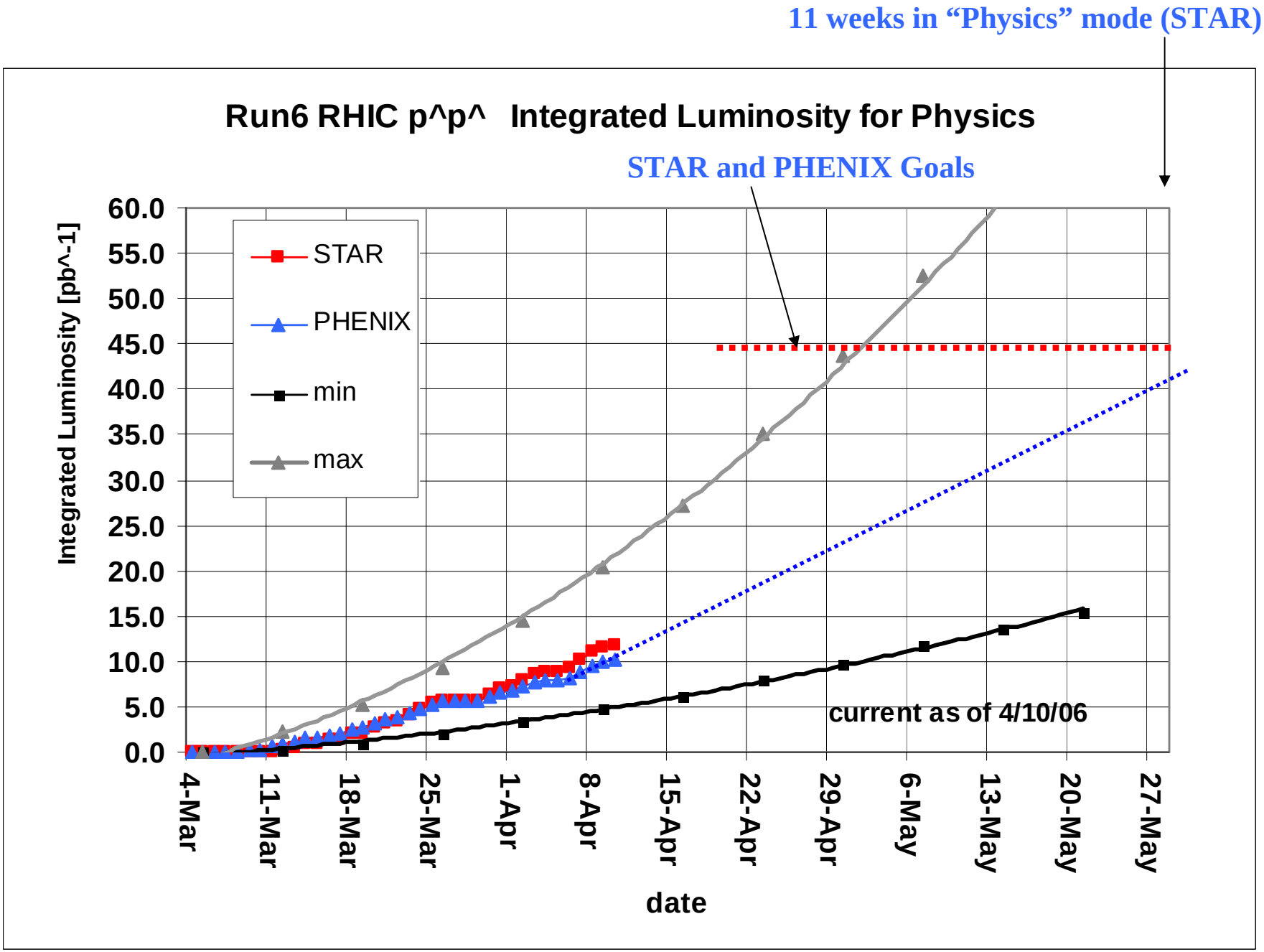
- low energy beam development - ?? Days

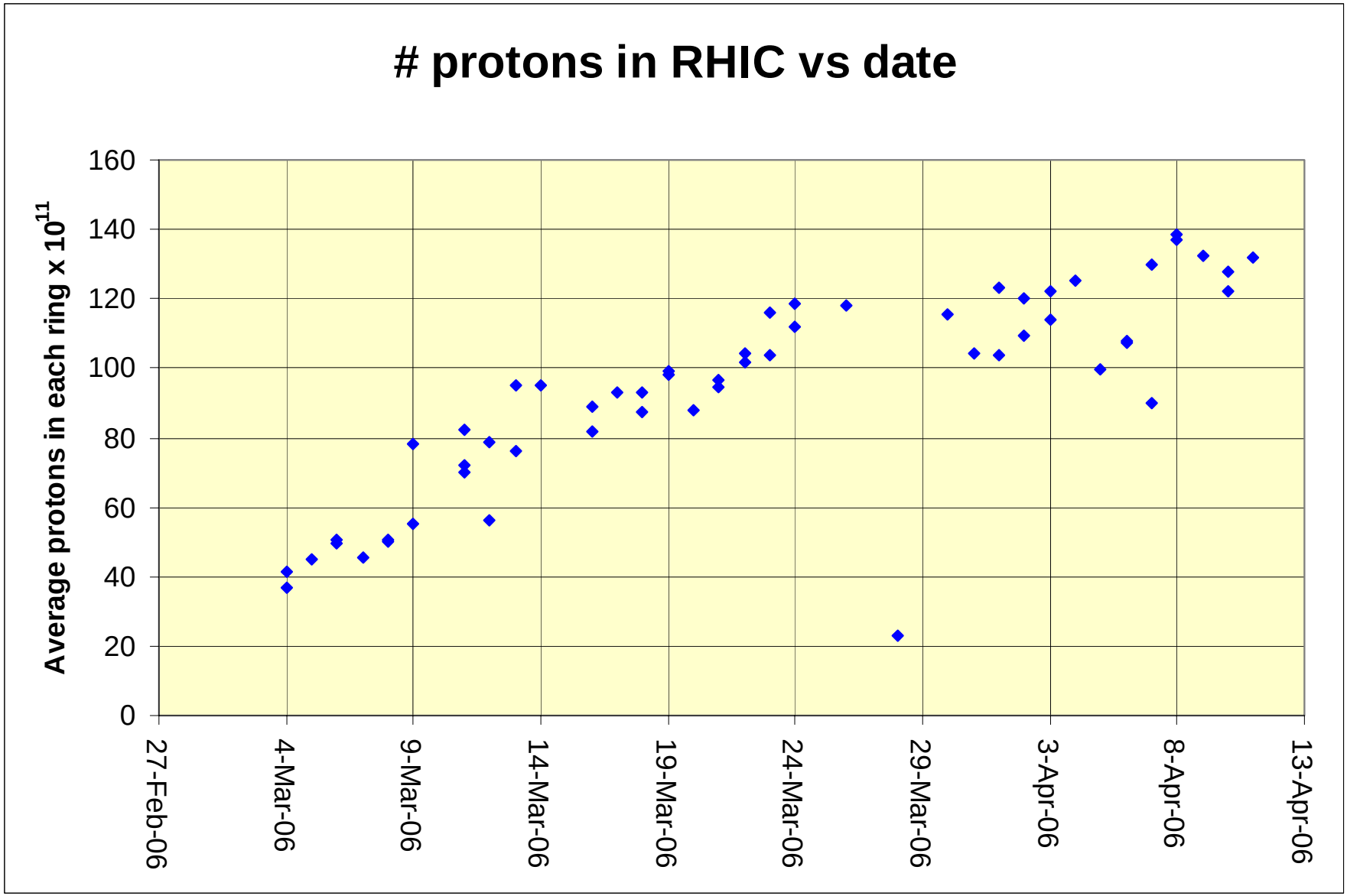
Experiment Goals (in progress)

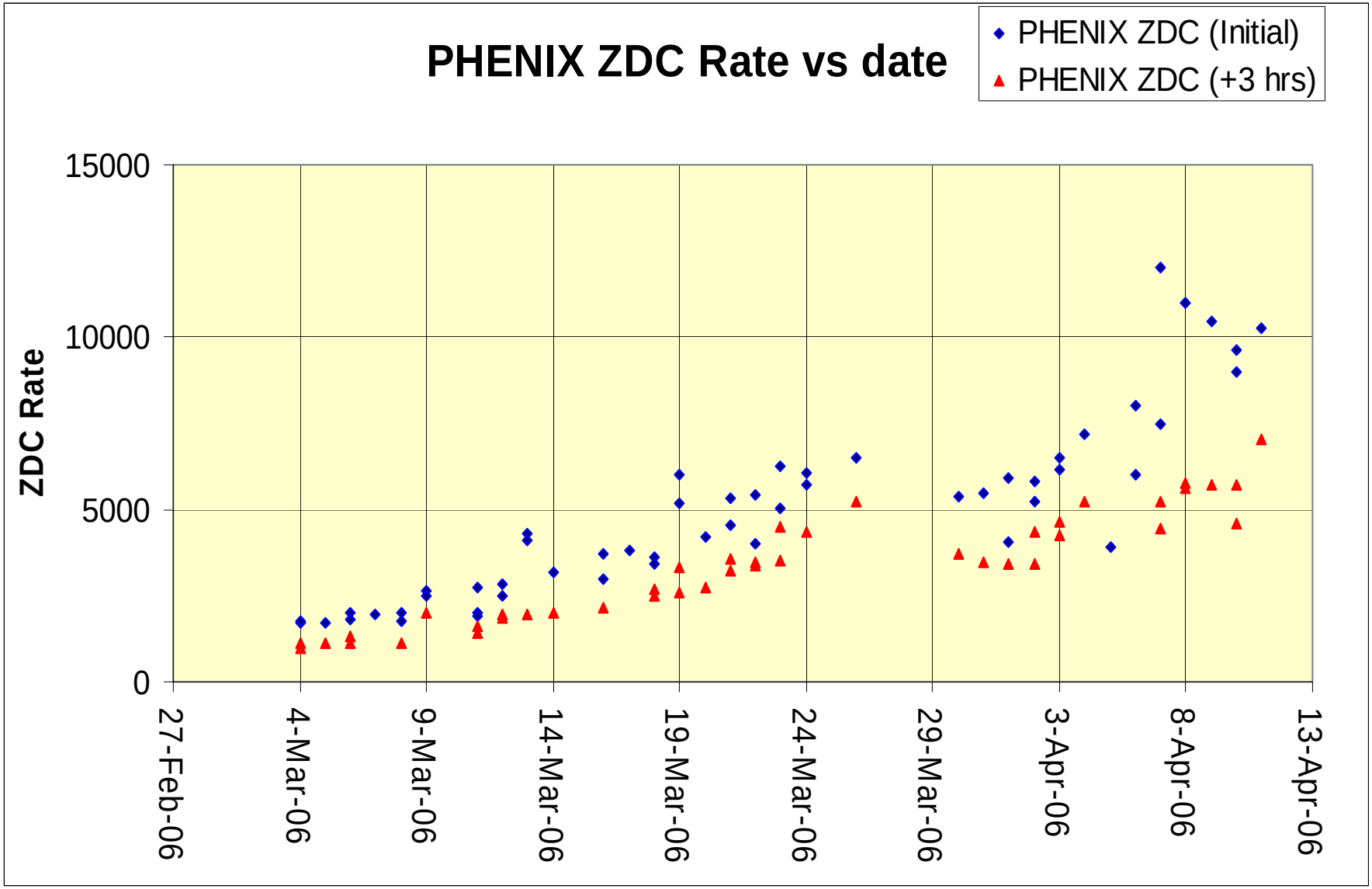
	$\sqrt{s}$	Pol. Config.	Recorded L	Delivered L	Pol	weeks
PHENIX:	200 GeV	Radial	4-7 pb^{-1}	10-17 pb^{-1}	$\geq$ 50%	3-4#
	200 GeV	Longitudinal	10 pb^{-1}	30 pb^{-1}	~ 60%	7
	62.4 GeV	Transverse	0.6 pb^{-1}	1.4 pb^{-1}	any	2
	*22 GeV		4 nb^{-1}	10 nb^{-1}		
STAR:	200 GeV	Transverse	5 pb^{-1}	15 pb^{-1}	$\geq$ 50%	~ 4
	200 GeV	Longitudinal	10 pb^{-1}	30 pb^{-1}	$\geq$ 50%	~7
	62.4 GeV	Transverse	◯ pb^{-1}	◯ pb^{-1}	$\geq$ ◯	2
BRAHMS:	62.4 GeV	Transverse	0.85 pb^{-1}	1.4 pb^{-1}	~ 50%	2

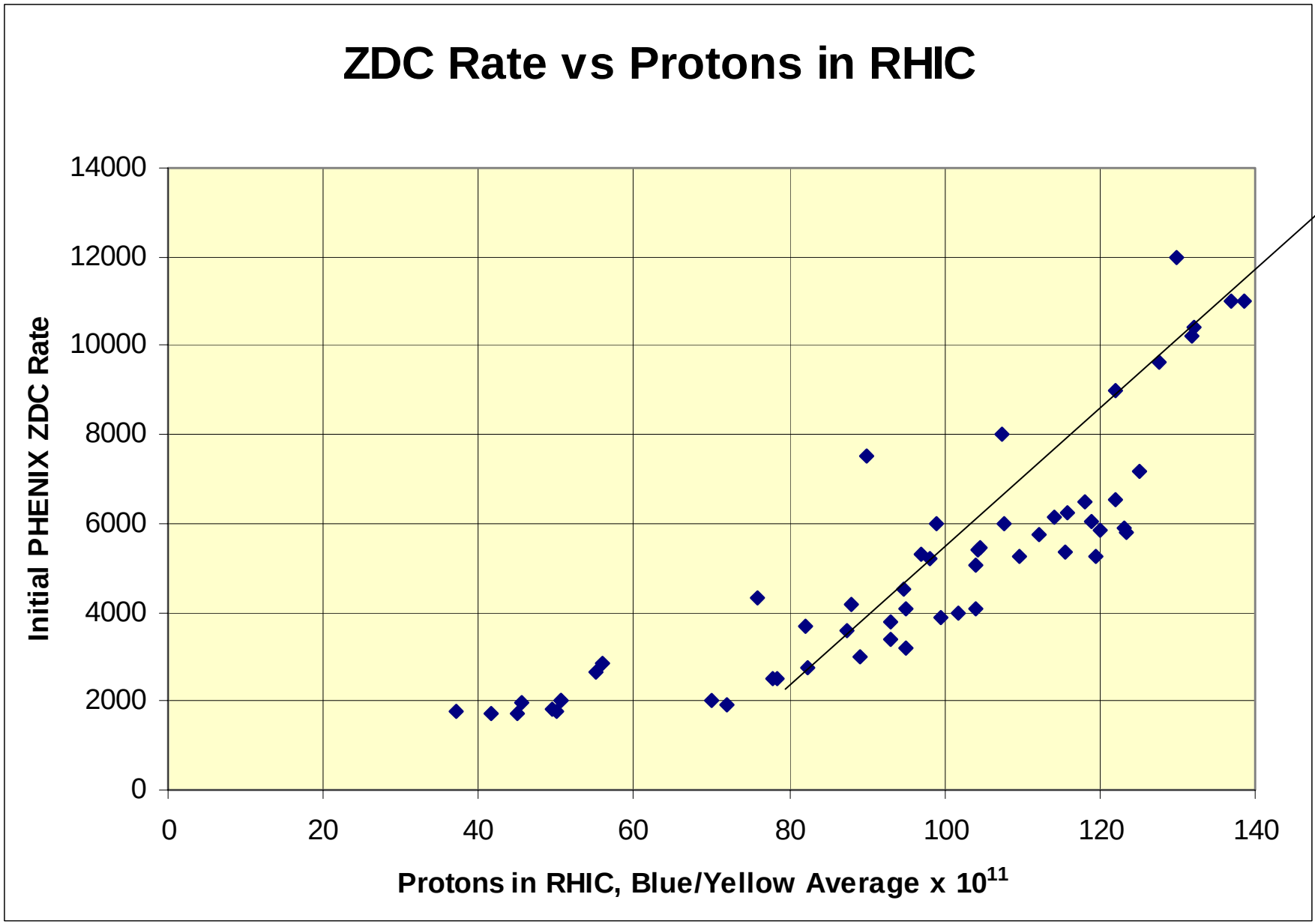
- Not in present plan
- # with 50-60% pol, end with ~~4 weeks of operation or~~ 4-7 recorded pb^{-1}, ~~whichever comes first~~

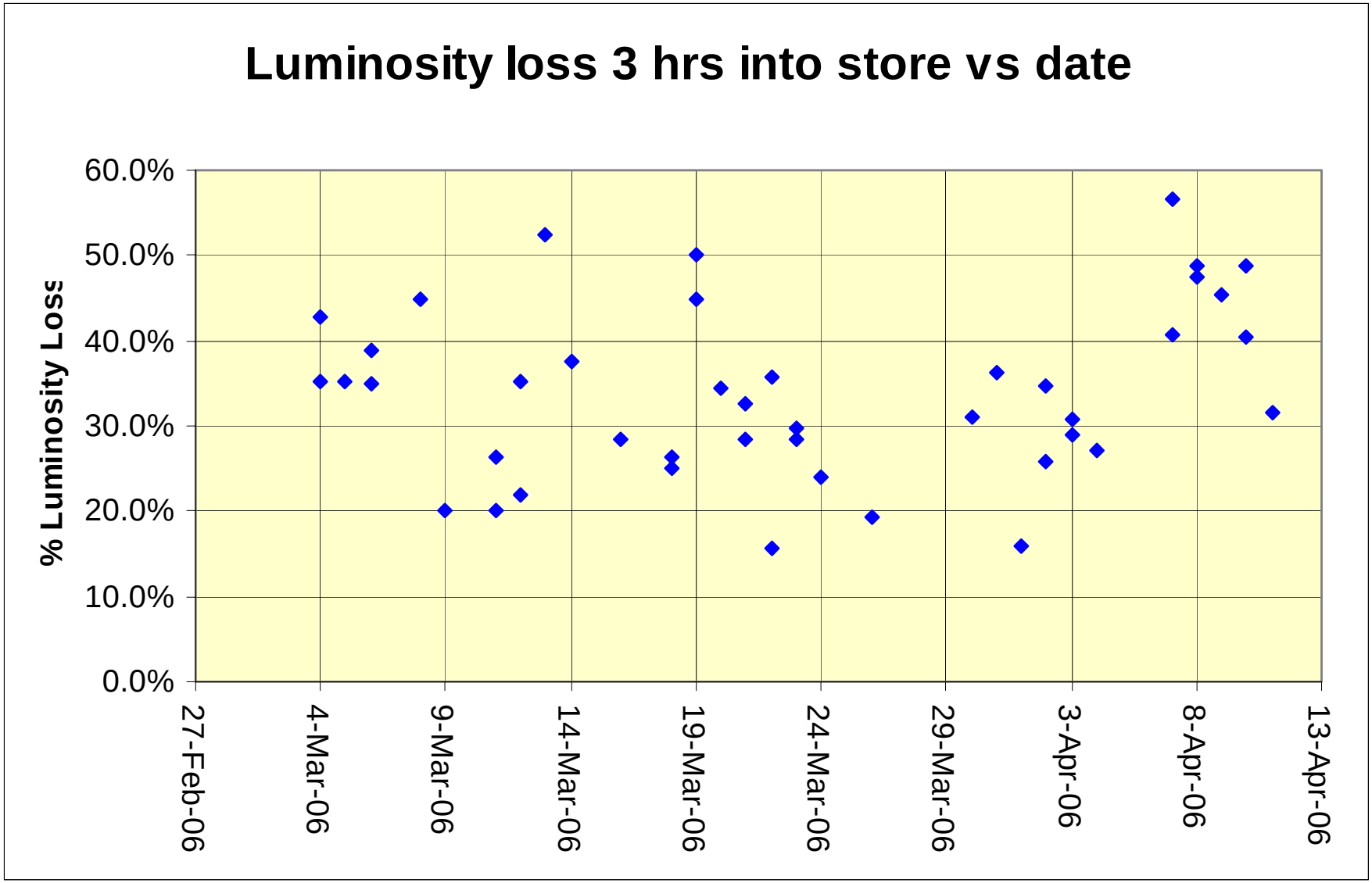

Run6 RHIC p^p^ Integrated Luminosity for Physics
PHENIX Radial Goals
Integrated Luminosity [pb^-1]
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
STAR
PHENIX
min
max
current as of 4/10/06
4-Mar
11-Mar
18-Mar
25-Mar
1-Apr
8-Apr
15-Apr
date

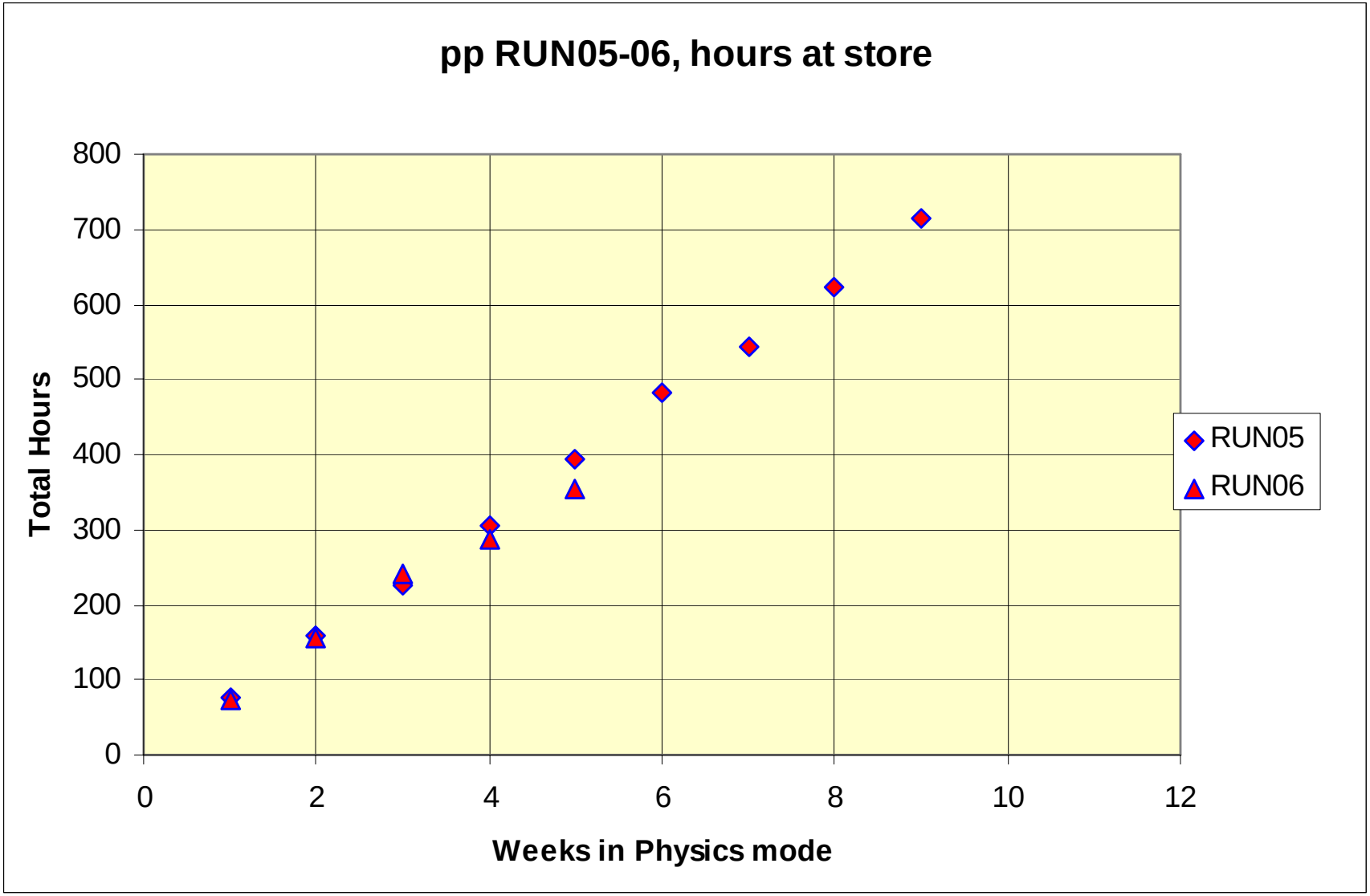

11 weeks in "Physics" mode (STAR)
Run6 RHIC p^p^ Integrated Luminosity for Physics
STAR and PHENIX Goals
Integrated Luminosity [pb^-1]
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
STAR
PHENIX
min
max
current as of 4/10/06
4-Mar
11-Mar
18-Mar
25-Mar
1-Apr
8-Apr
15-Apr
22-Apr
29-Apr
6-May
13-May
20-May
27-May
date

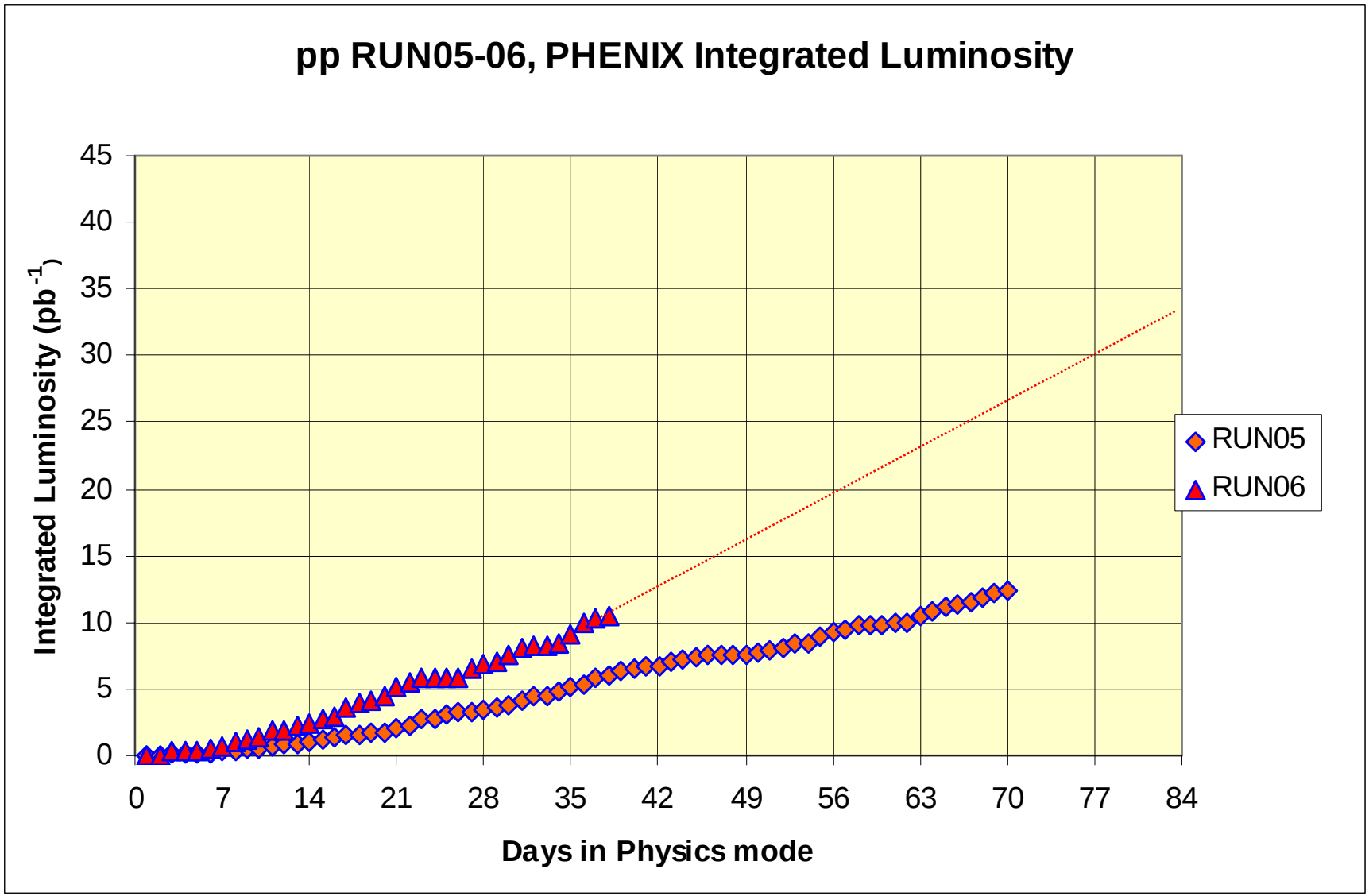

protons in RHIC vs date
Average protons in each ring x 10^11
0
20
40
60
80
100
120
140
160
27-Feb-06
4-Mar-06
9-Mar-06
14-Mar-06
19-Mar-06
24-Mar-06
29-Mar-06
3-Apr-06
8-Apr-06
13-Apr-06


PHENIX ZDC Rate vs date
PHENIX ZDC (Initial)
PHENIX ZDC (+3 hrs)
ZDC Rate
15000
10000
5000
0
27-Feb-06
4-Mar-06
9-Mar-06
14-Mar-06
19-Mar-06
24-Mar-06
29-Mar-06
3-Apr-06
8-Apr-06
13-Apr-06

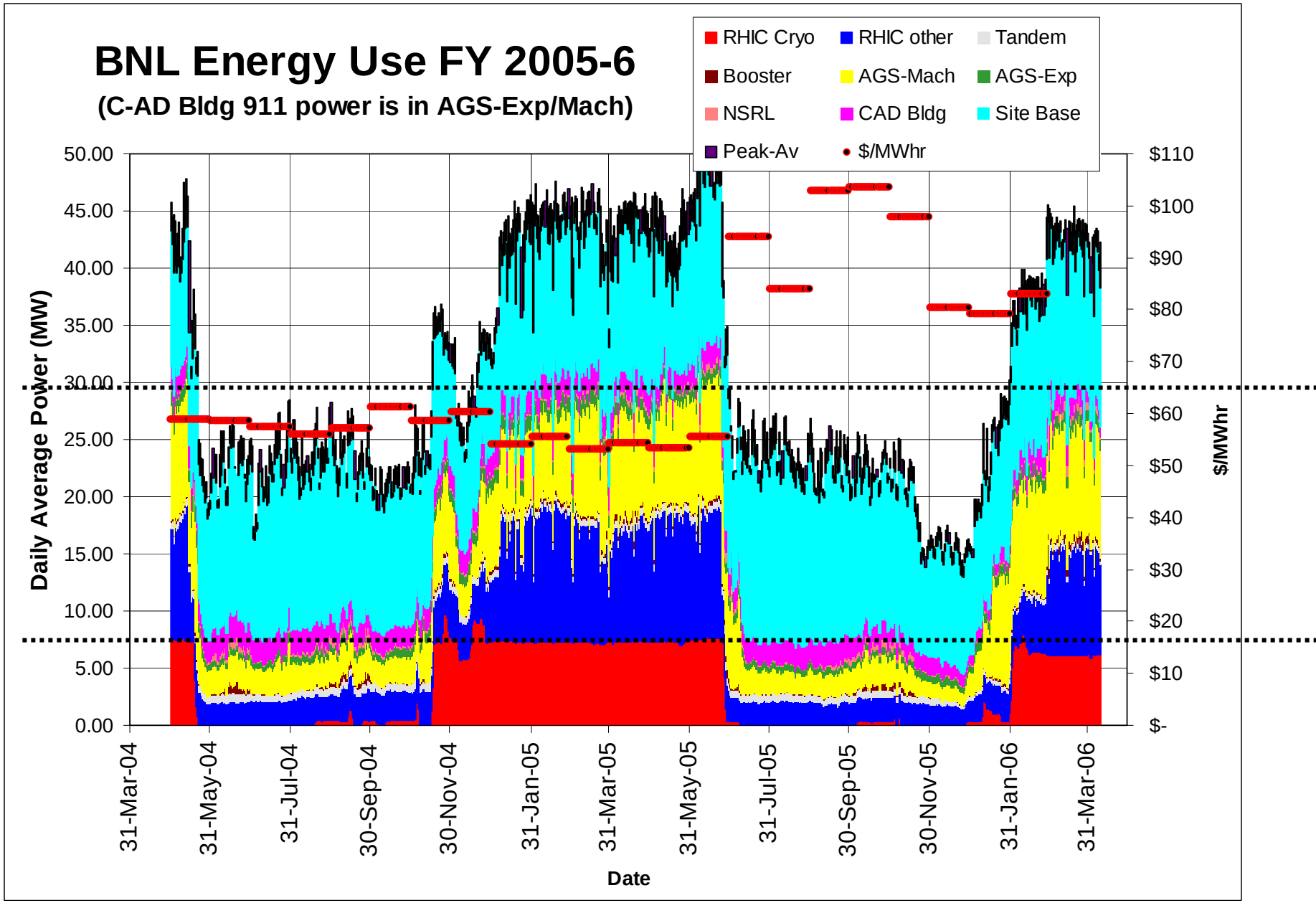

ZDC Rate vs Protons in RHIC
Initial PHENIX ZDC Rate
14000
12000
10000
8000
6000
4000
2000
0
0
20
40
60
80
100
120
140
Protons in RHIC, Blue/Yellow Average x 10^11


Luminosity loss 3 hrs into store vs date
% Luminosity Loss
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
27-Feb-06
4-Mar-06
9-Mar-06
14-Mar-06
19-Mar-06
24-Mar-06
29-Mar-06
3-Apr-06
8-Apr-06
13-Apr-06


pp RUN05-06, hours at store
Total Hours
800
700
600
500
400
300
200
100
0
0
2
4
6
8
10
12
Weeks in Physics mode
RUN05
RUN06


pp RUN05-06, PHENIX Integrated Luminosity
Integrated Luminosity (pb-1)
45
40
35
30
25
20
15
10
5
0
0
7
14
21
28
35
42
49
56
63
70
77
84
Days in Physics mode
RUN05
RUN06

As of 9 Apr 2006



RHIC Machine/Detector Planning Meeting

Archive

RHIC Run 7 – first look at possible run plan

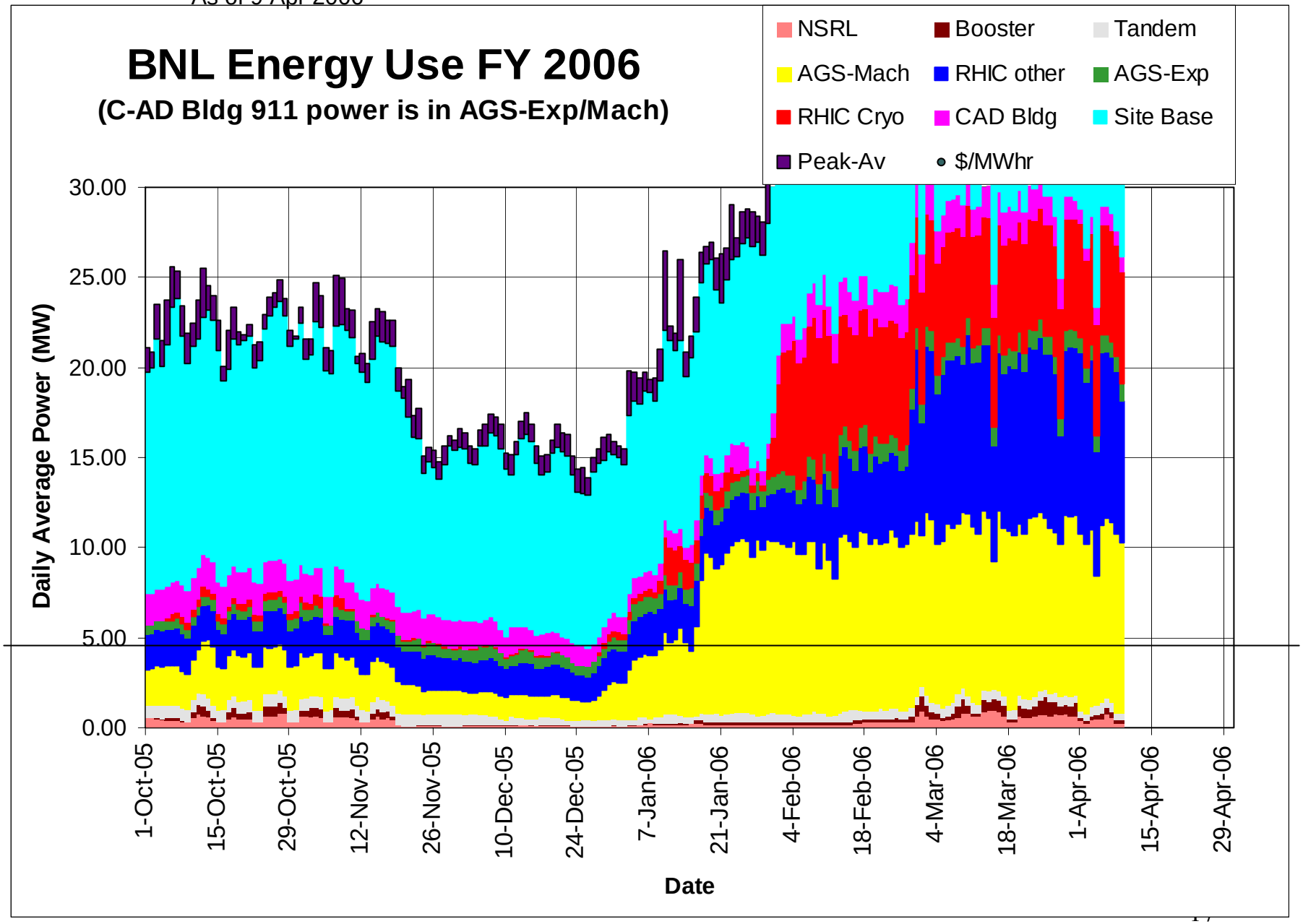
- PHENIX
  - Long Au-Au run at $\sqrt{s}$=200 GeV/n
  - pp development, especially for $\sqrt{s}$=500 GeV

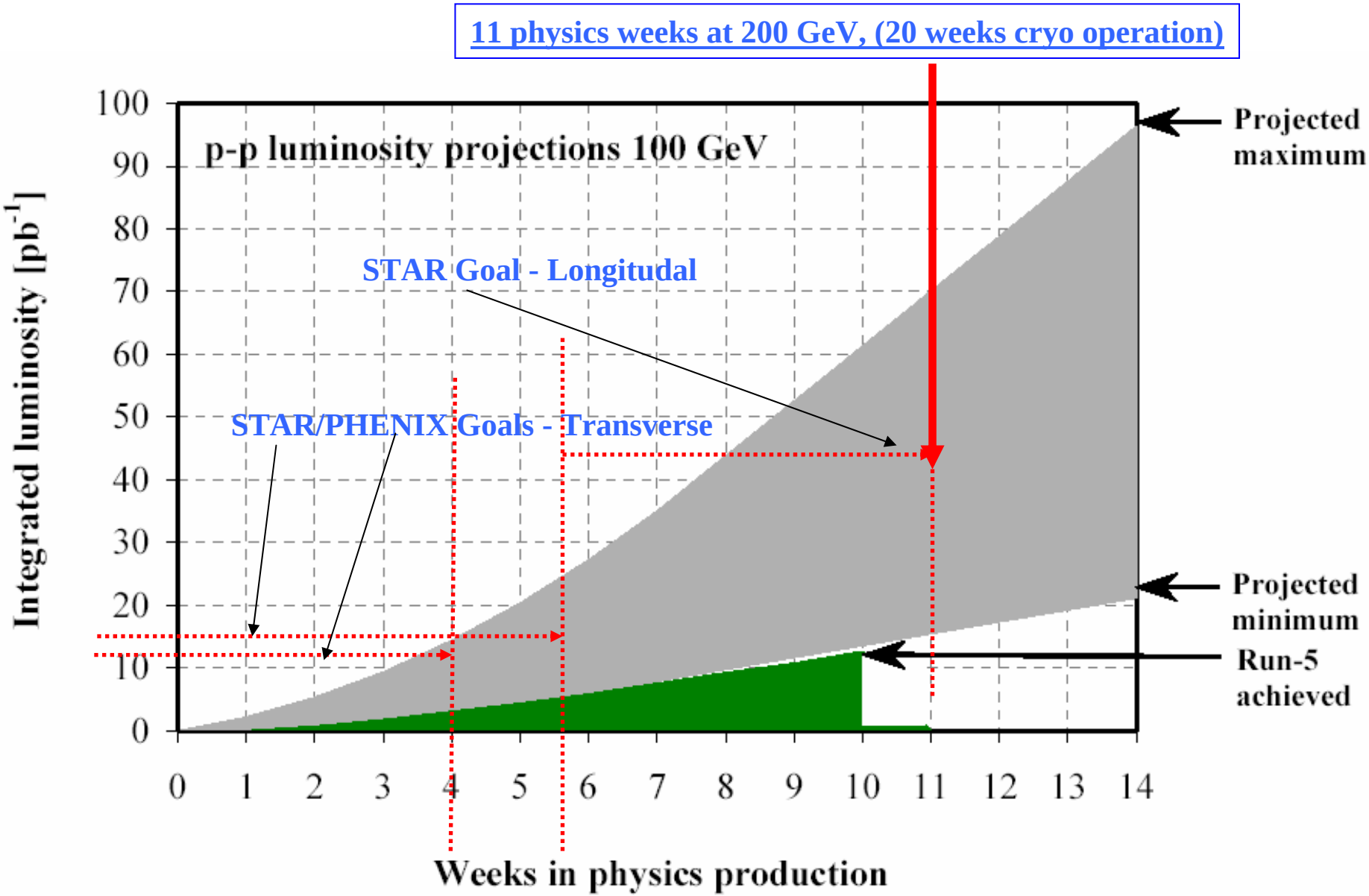
- STAR
  - d-Au at $\sqrt{s}$=200 GeV/n
  - pp development

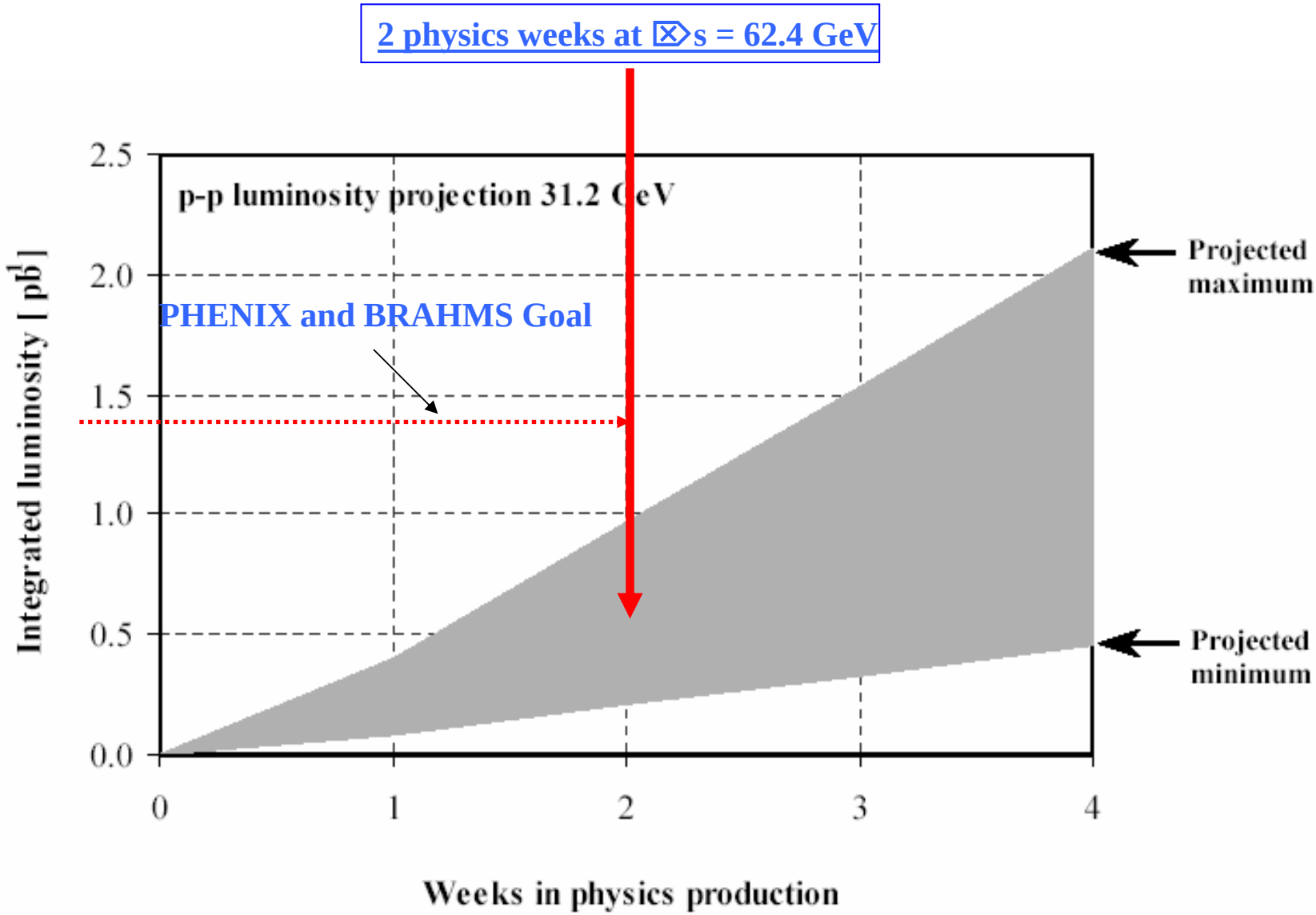
As of 9 Apr 2006

BNL Energy Use FY 2006

(C-AD Bldg 911 power is in AGS-Exp/Mach)




11 physics weeks at 200 GeV, (20 weeks cryo operation)
p-p luminosity projections 100 GeV
STAR Goal - Longitudal
STAR/PHENIX Goals - Transverse
Projected maximum
Projected minimum
Run-5 achieved
Integrated luminosity [pb^{-1}]
Weeks in physics production
0
10
20
30
40
50
60
70
80
90
100
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14


2 physics weeks at √s = 62.4 GeV
p-p luminosity projection 31.2 GeV
PHENIX and BRAHMS Goal
Projected maximum
Projected minimum
Integrated luminosity [pb-1]
Weeks in physics production
2.5
2.0
1.5
1.0
0.5
0.0
0
1
2
3
4

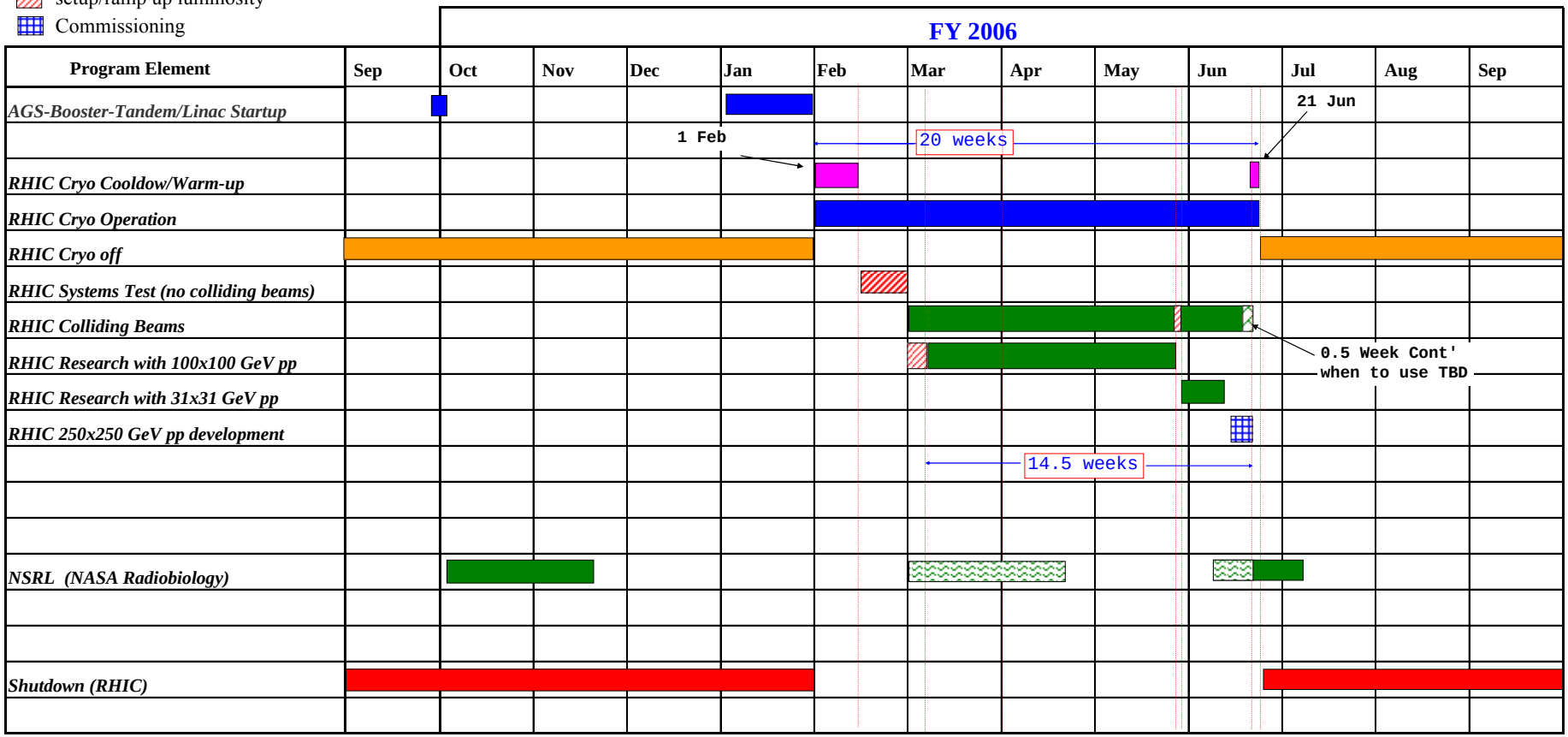
http://www.c-ad.bnl.gov/estd

C-A Operations-FY06

30 Jan 06

The Plan

- Contingency
- schedule to be determined
- setup/ramp up luminosity
- Commissioning



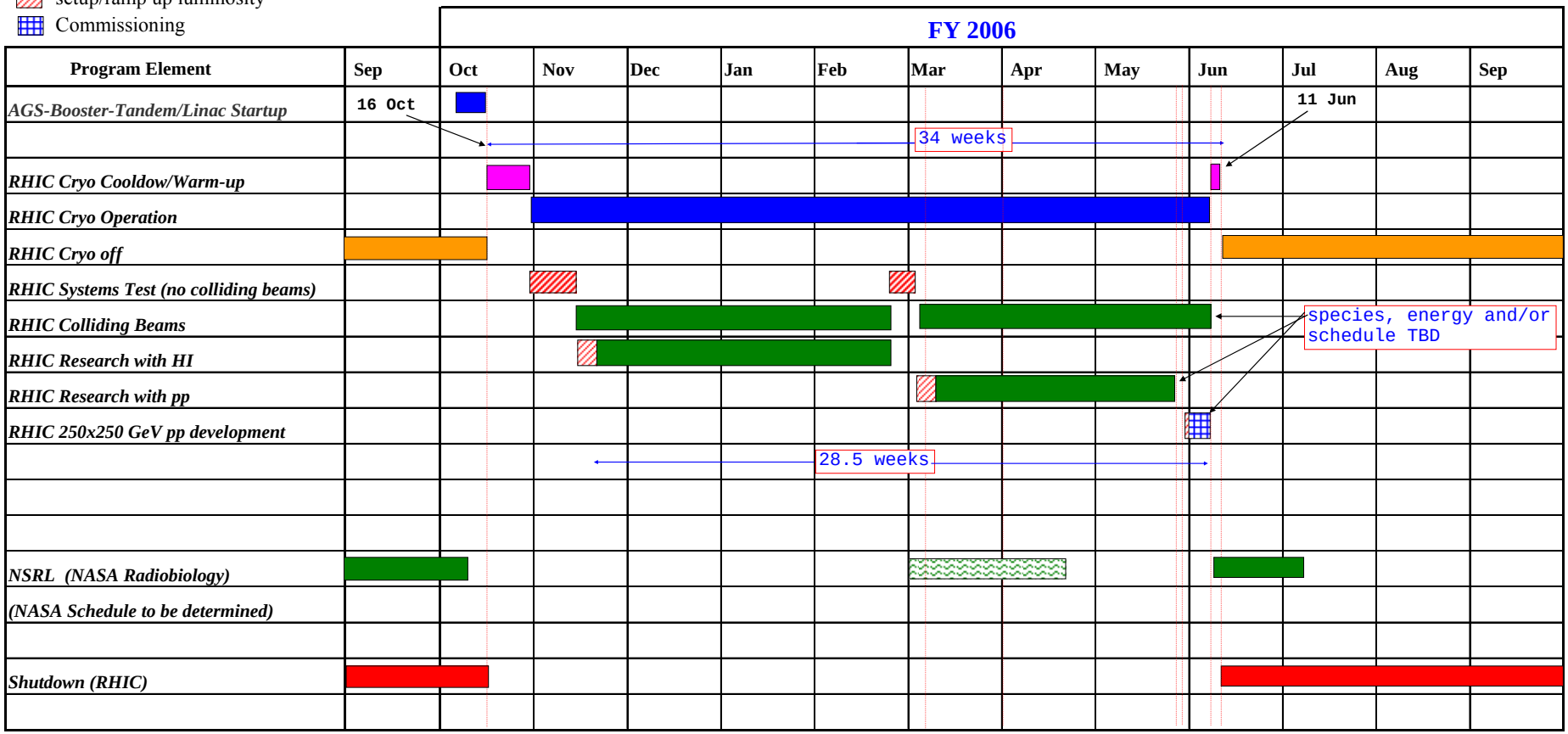
http://www.c-ad.bnl.gov/estd

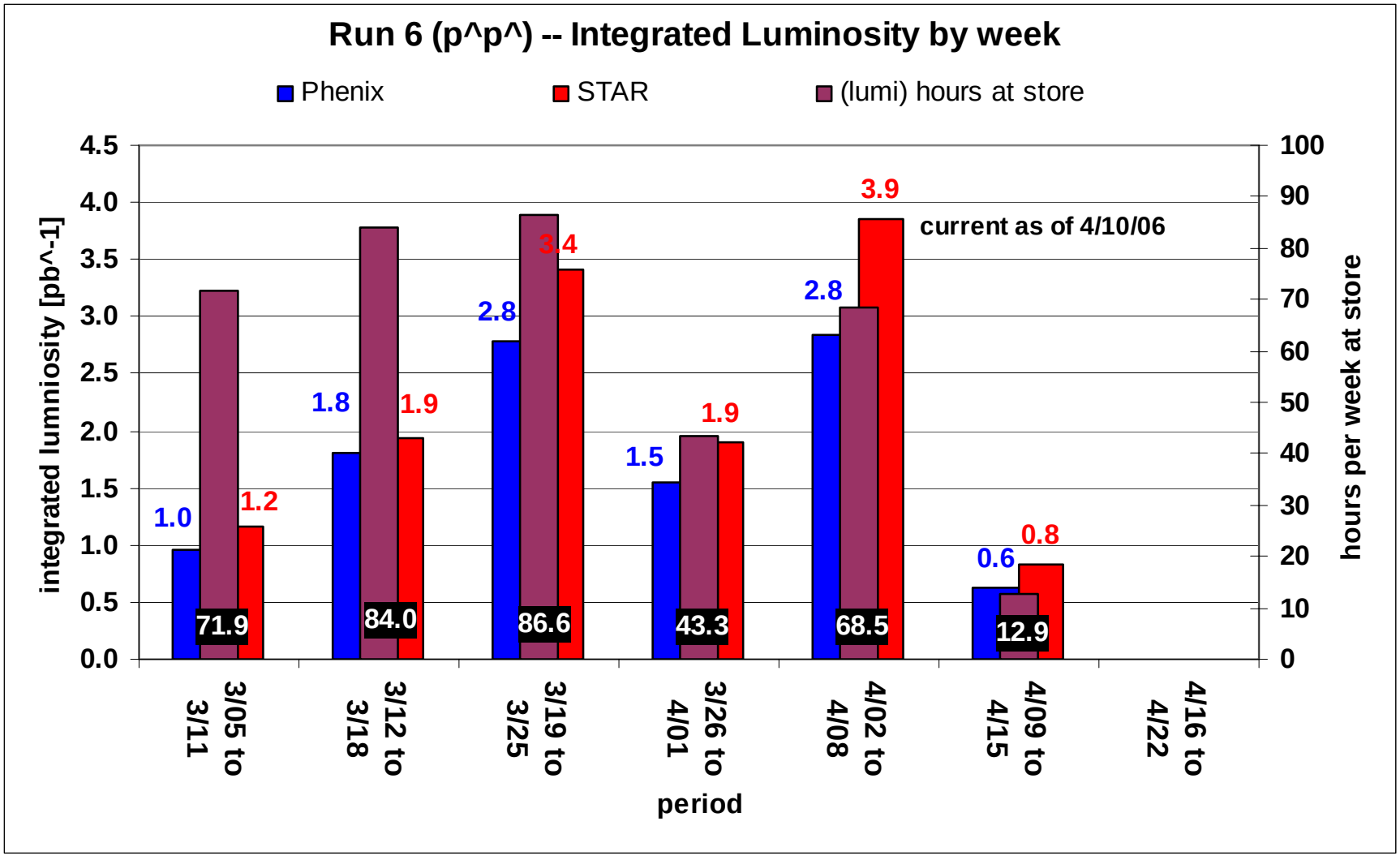
C-A Operations-FY07

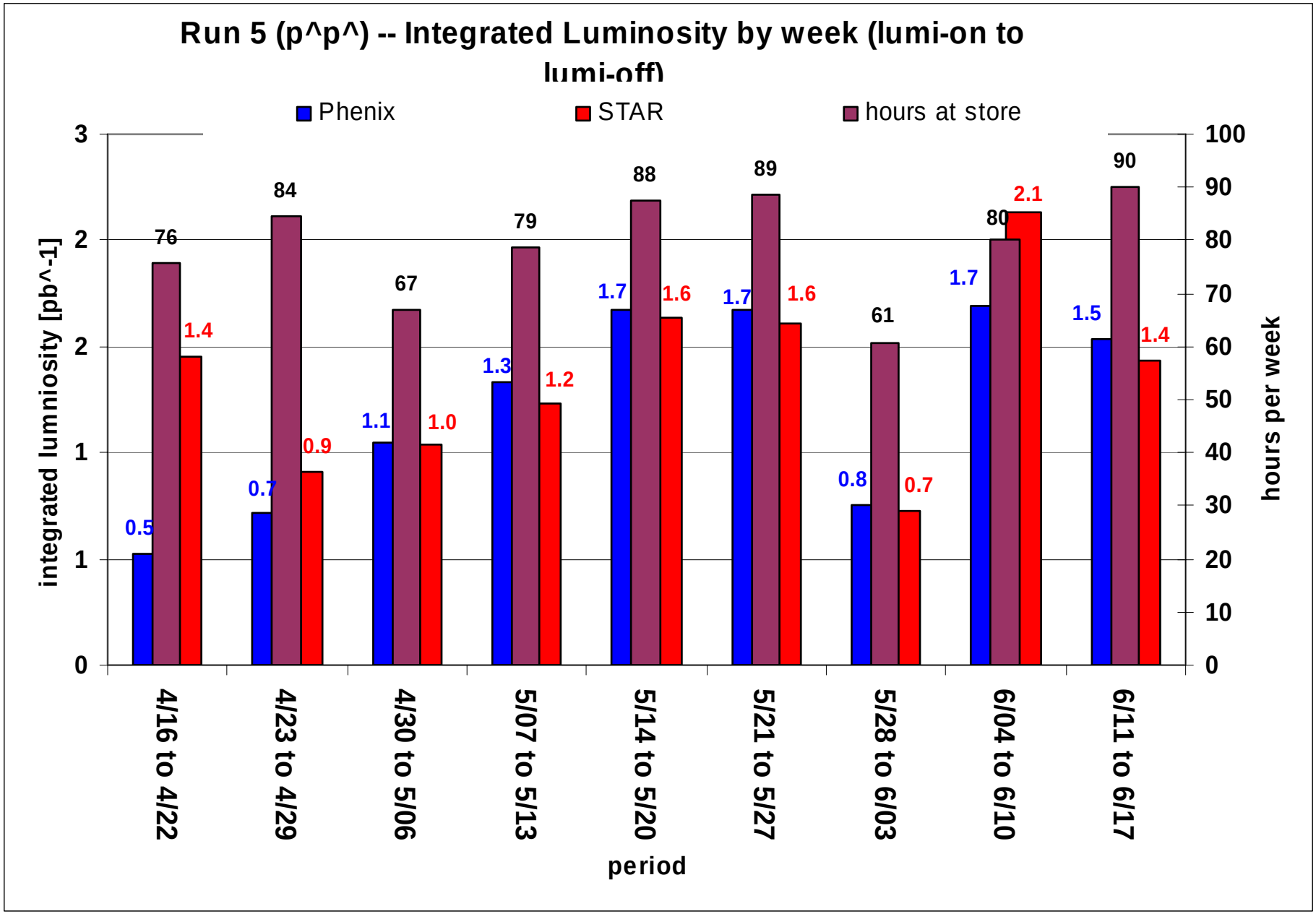
14 Mar 06

34 week Draft Plan

- Contingency
- concurrent with RHIC
- setup/ramp up luminosity
- Commissioning




Run 6 (p^p^) -- Integrated Luminosity by week
Phenix
STAR
(lumi) hours at store
integrated lumniosity [pb^-1]
hours per week at store
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
100
90
80
70
60
50
40
30
20
10
0
1.0
1.2
71.9
1.8
1.9
84.0
2.8
3.4
86.6
1.5
1.9
43.3
2.8
3.9
68.5
current as of 4/10/06
0.6
0.8
12.9
3/05 to 3/11
3/12 to 3/18
3/19 to 3/25
3/26 to 4/01
4/02 to 4/08
4/09 to 4/15
4/16 to 4/22
period


Run 5 (p^p^) -- Integrated Luminosity by week (lumi-on to lumi-off)
Phenix
STAR
hours at store
integrated lumniosity [pb^-1]
hours per week
period
4/16 to 4/22
4/23 to 4/29
4/30 to 5/06
5/07 to 5/13
5/14 to 5/20
5/21 to 5/27
5/28 to 6/03
6/04 to 6/10
6/11 to 6/17
0.5
1.4
76
0.7
0.9
84
1.1
1.0
67
1.3
1.2
79
1.7
1.6
88
1.7
1.6
89
0.8
0.7
61
1.7
2.1
80
1.5
1.4
90