

# RUN 11 RHIC MACHINE/EXPERIMENTS MEETING

15 Feb 2011

Agenda:

- Status –

# RUN 11 RHIC MACHINE/EXPERIMENTS MEETING

## DECISIONS

11/23/2010

- Agreed to new APEX schedule, 12 hour sessions (0800-2400) every other week away from maintenance days.

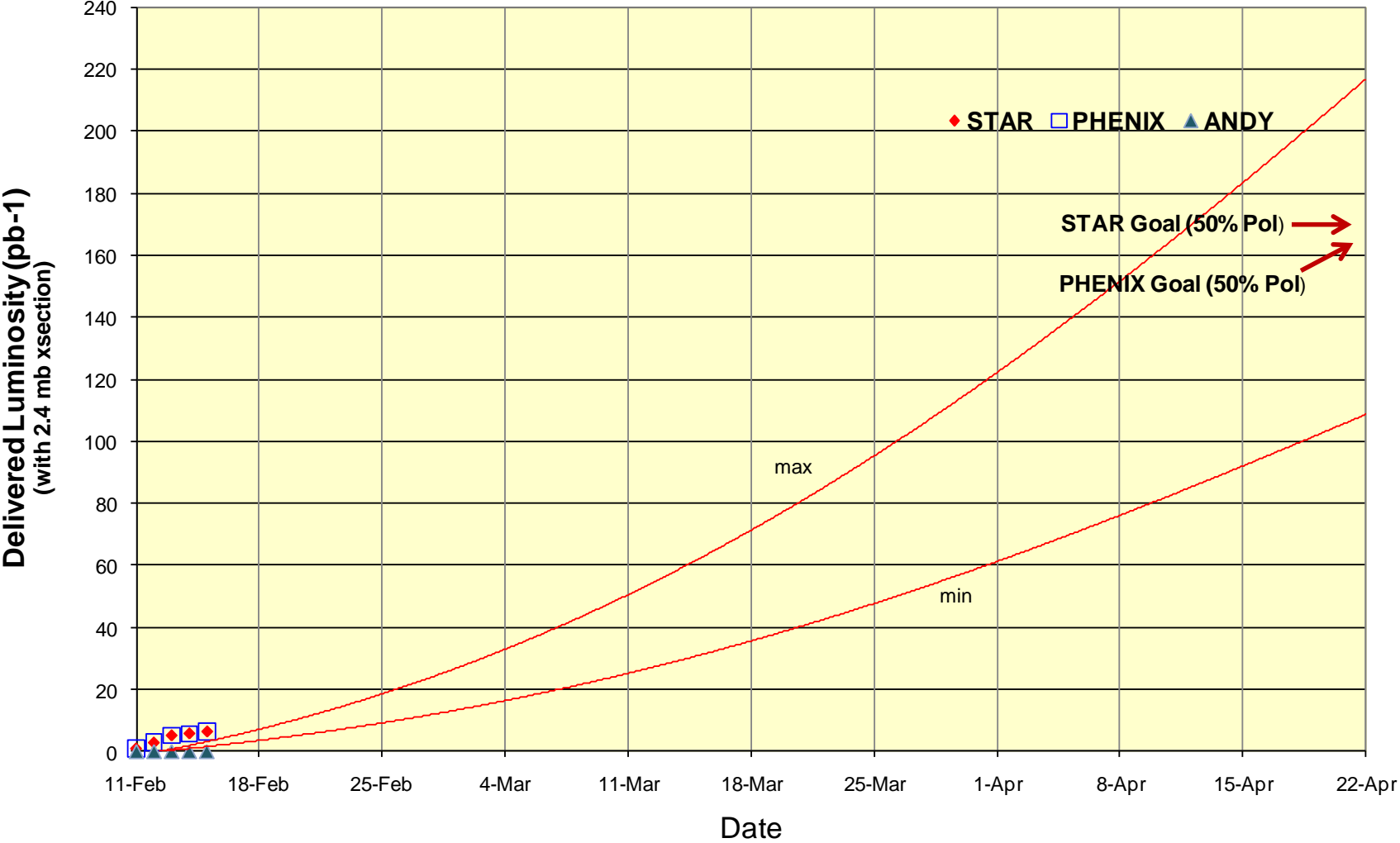
## Run 11 Plan based on PAC recommendation/ALD Guidance and 28.3 weeks cryo operation 2/15/10 update

- 3 Jan, Begin cool-down to 4.5K
- 8 Jan, Cool-down to 4.5K complete in both rings, preliminary setup begins
- ~11 Jan, 2 ½ weeks beam setup for  $\sqrt{s} = 500$  GeV pp in RHIC begins.
- 15 Jan, power supply work/DX training complete
- 17 Jan, first successful ramp
- 19 Jan, 1<sup>st</sup> maint day
- ~~27~~ 24 Jan, 1 week Ramp-up with 8 hr/night beam to experiments
- ~~3~~ **11 Feb (machine), begin 10(?) week physics run ( $\sqrt{s} = 500$  GeV pp)**
- **4 March – Continuing Resolution Ends**
- **28 March – 1 April, PAC 2011**
- **14 Apr, end 10 week physics run at  $\sqrt{s} = 500$  GeV pp run**
- 14 Apr, begin 1 week setup for  $\sqrt{s} = 200$  AuAu
- 21 Apr, begin 1 week Ramp-up with 8 hr/night beam to experiments
- **28 Apr, begin 8 week physics run at ( $\sqrt{s} = 200$  AuAu)**
- **23 Jun, end 8 week  $\sqrt{s} = 200$  AuAu run**
- 23 Jun, begin setup for  $\sqrt{s} = 192$  GeV UU
- **30 Jun, begin 1½ week physics run ( $\sqrt{s} = 192$  UU)**
- **4 July – completed 26 weeks of cryo operation, may be out of \$\$'s**
- **10 Jul, end 1½ week physics run at  $\sqrt{s} = 192$  GeV**
- 10 Jul, begin setup for  $\sqrt{s} = 18$  GeV AuAu
- **11 Jul, begin 1 week physics run ( $\sqrt{s} = 18$  AuAu)**
- **18 Jul, end 1 week physics run at  $\sqrt{s} = 18$  GeV**
- 20 Jul, warm-up complete (28.3 weeks)

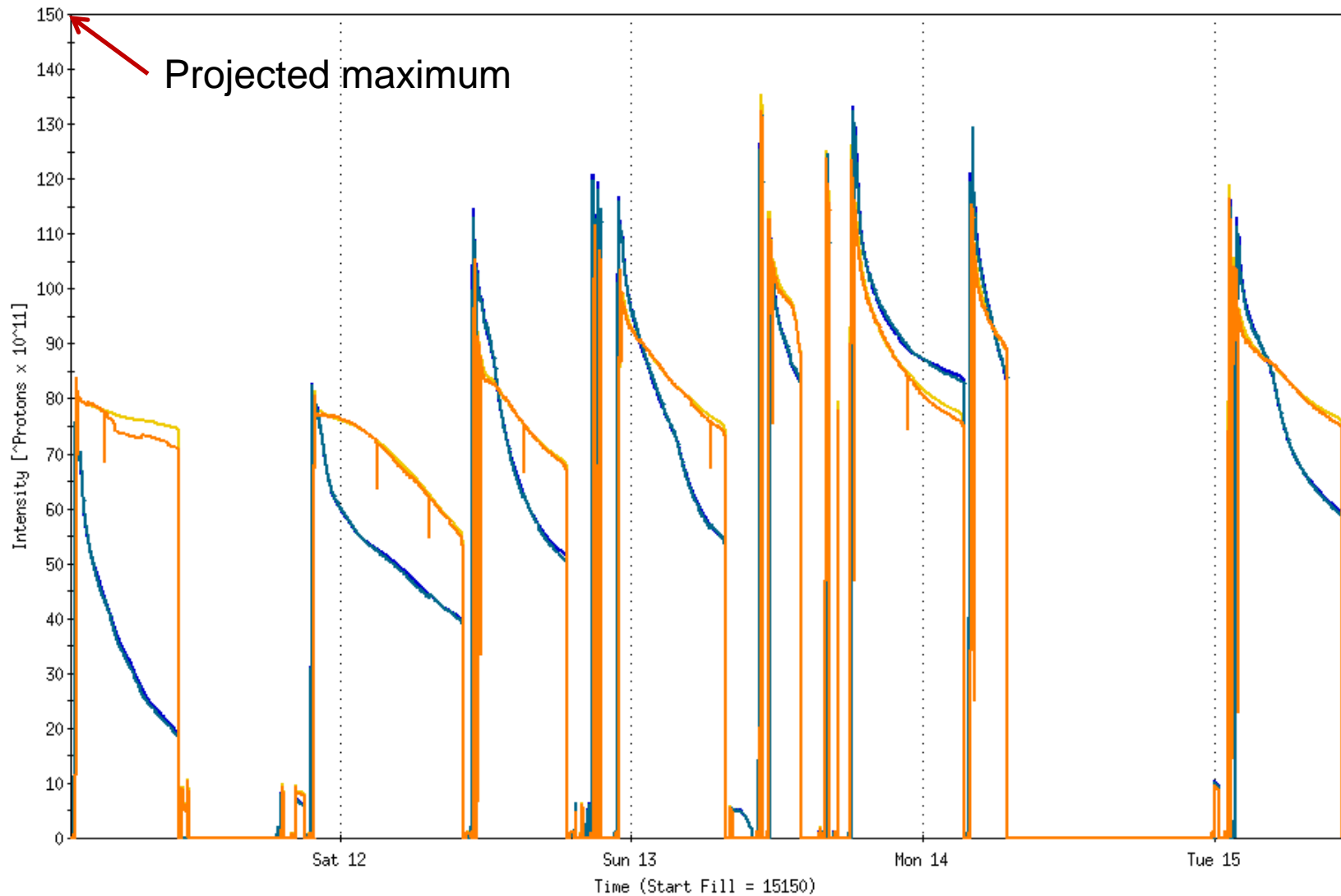
Possible additions:

- Low energy test run

# Run 11 250 x 250 GeV pp, Luminosity



# Physics Stores 15150 through 15170



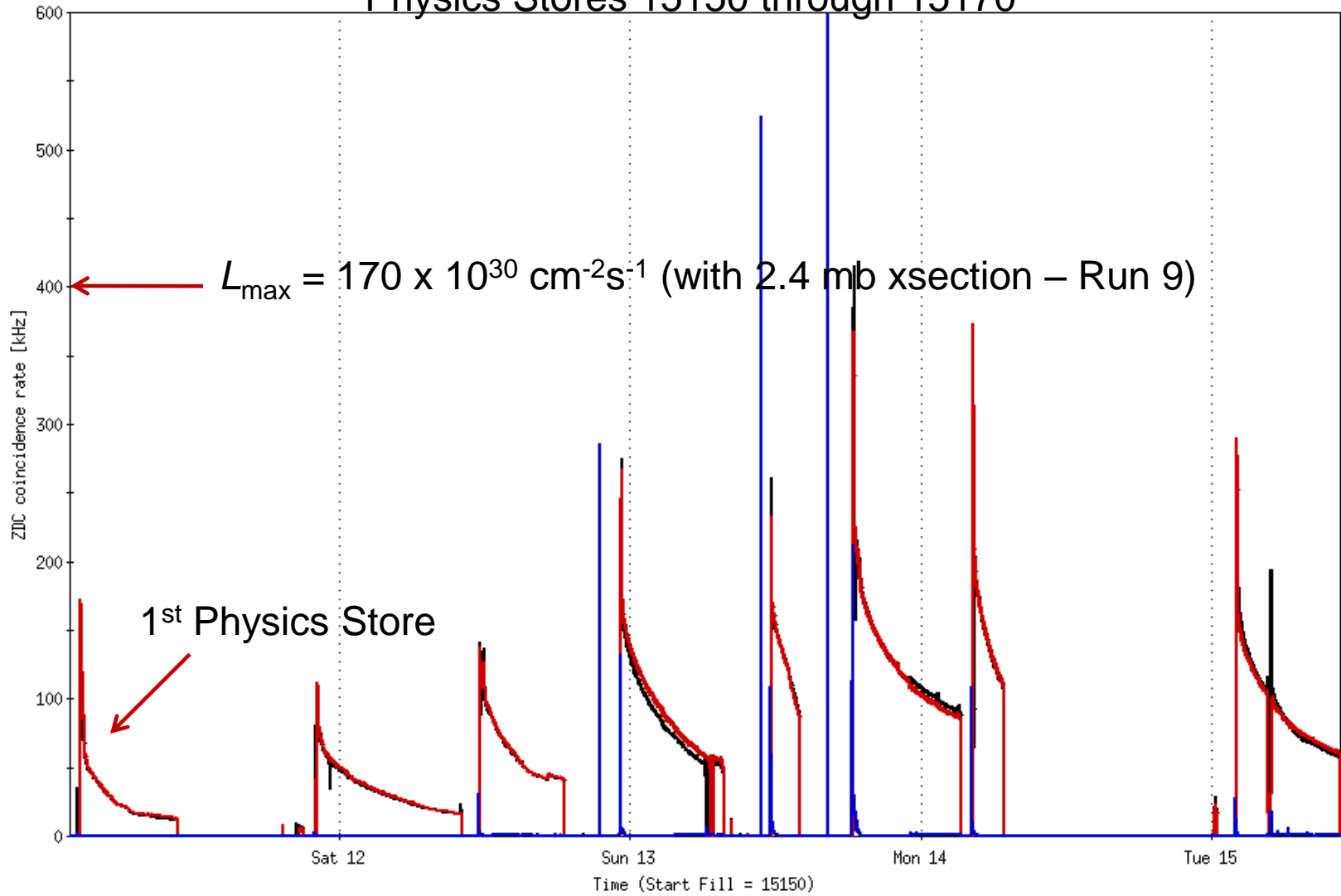
bluDCCTtotal (C)

ye1DCCTtotal (C)

bluWCMbunched (C)

ye1WCMbunched (C)

# Physics Stores 15150 through 15170



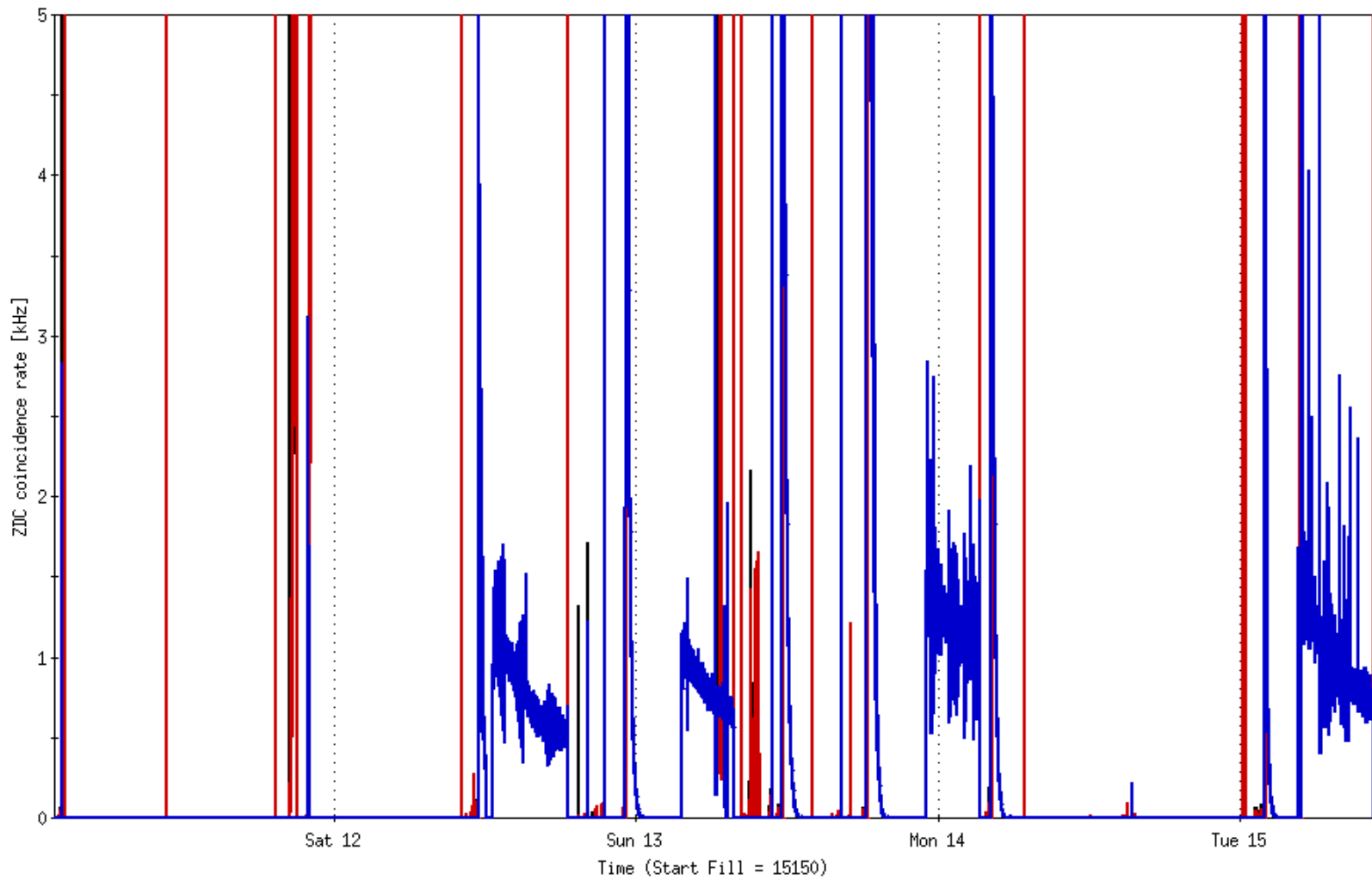
— STAR..ZDC. (C)

— PHENIX..ZDC. (C)

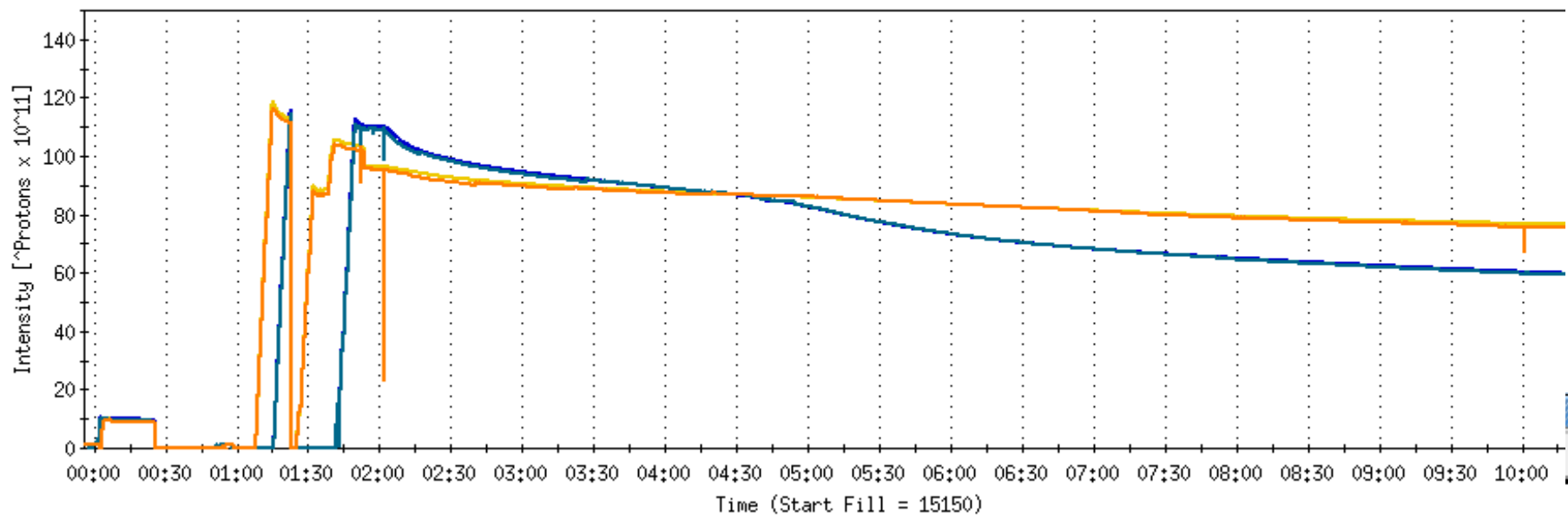
— AnDY..ZDC. (C)

# ANDY Physics Stores

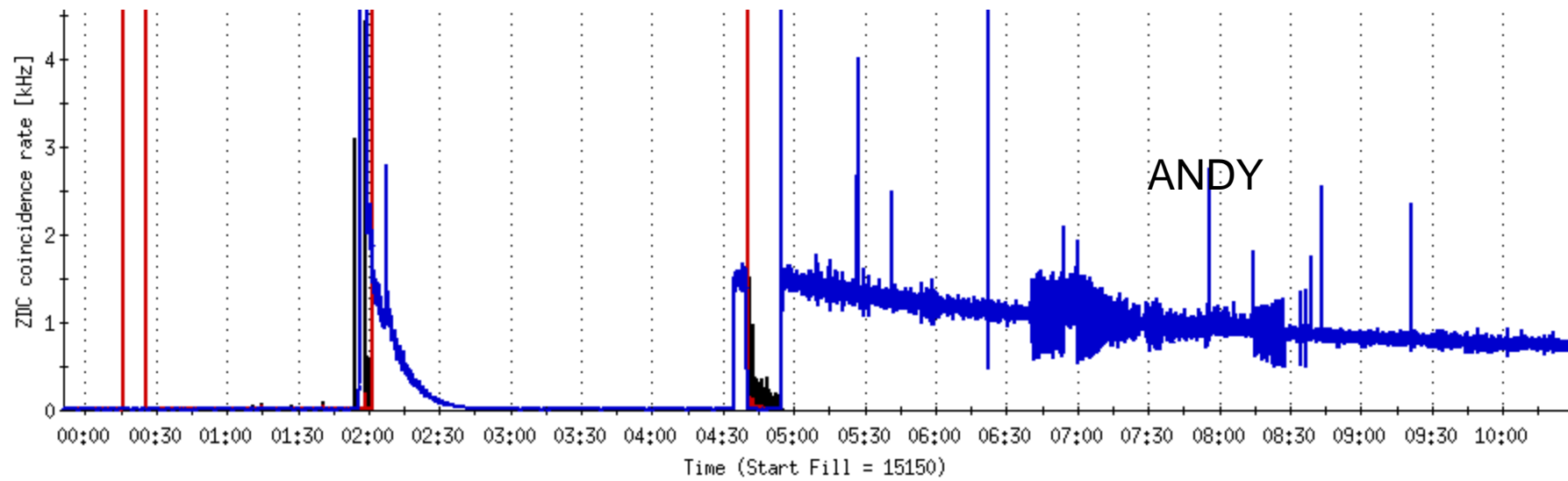
Experimental Coincidence Signals



— STAR, ZDC, (C)    — PHENIX, ZDC, (C)    — ANDY, ZDC, (C)



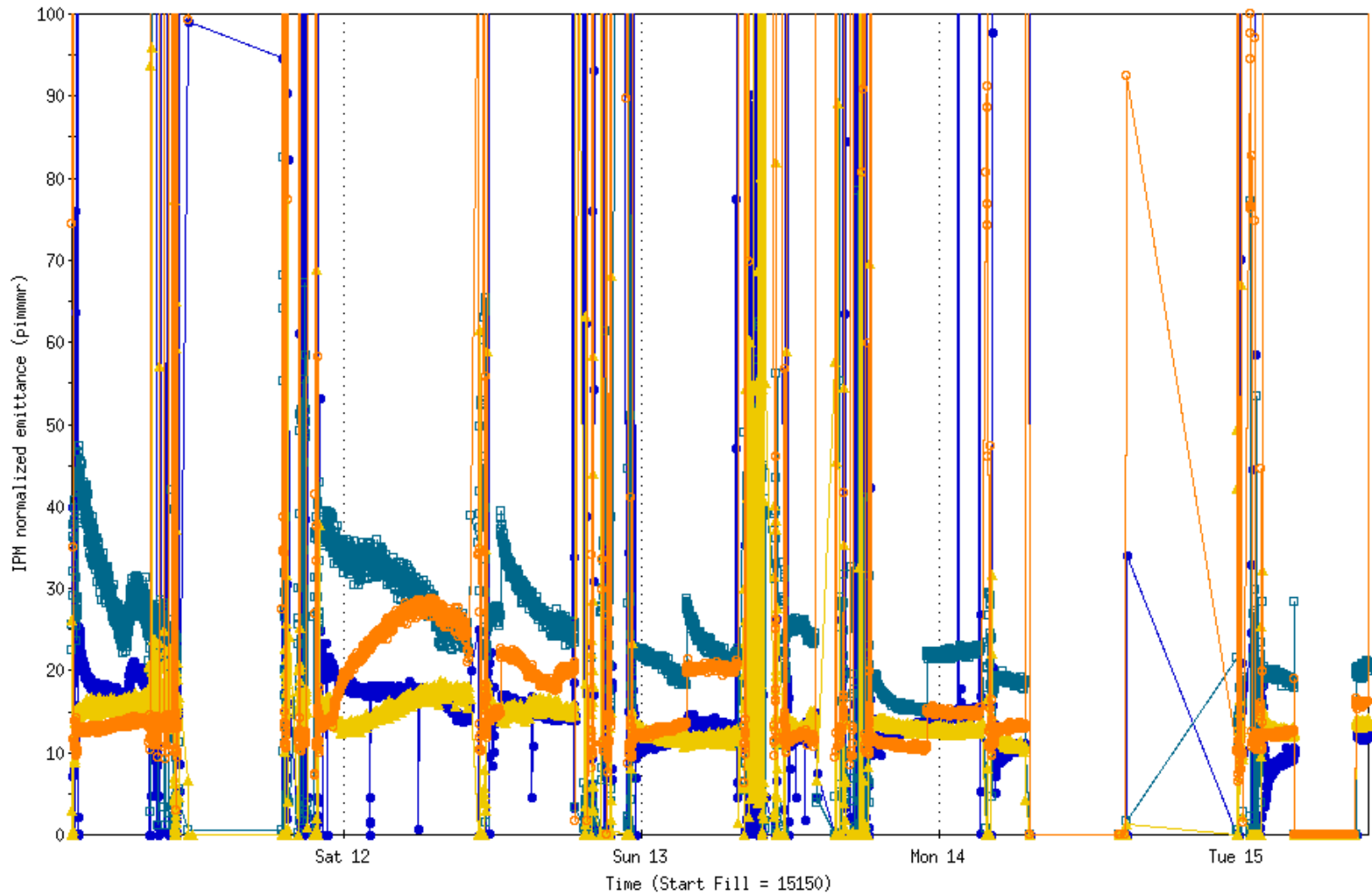
bluDCCTtotal (C)    yelDCCTtotal (C)    bluWCMbunched    yelWCMbunched



STAR..ZDC. (C)    PHENIX..ZDC. (C)    AnDY..ZDC. (C)



# Physics Stores 15150 through 15170



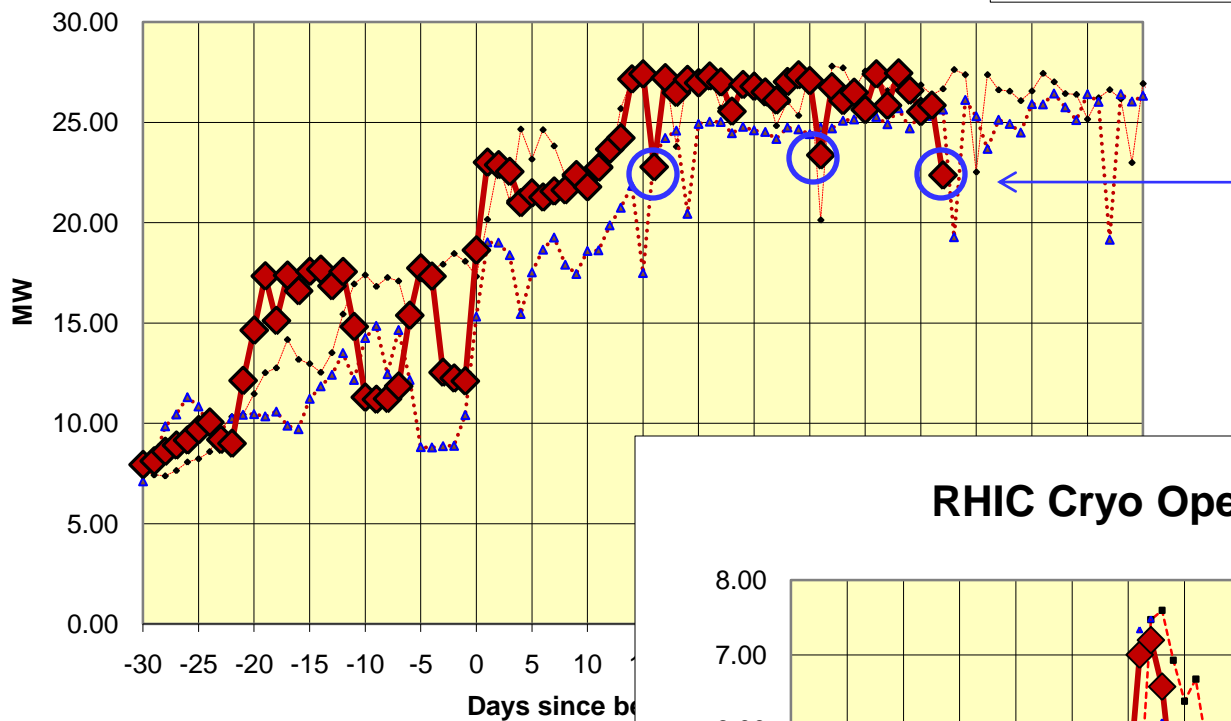
● RhicIpmManager.blue\_horiz;normEmitM[.] (C)

▲ RhicIpmManager.yellow\_horiz;normEmitM[.] (C)

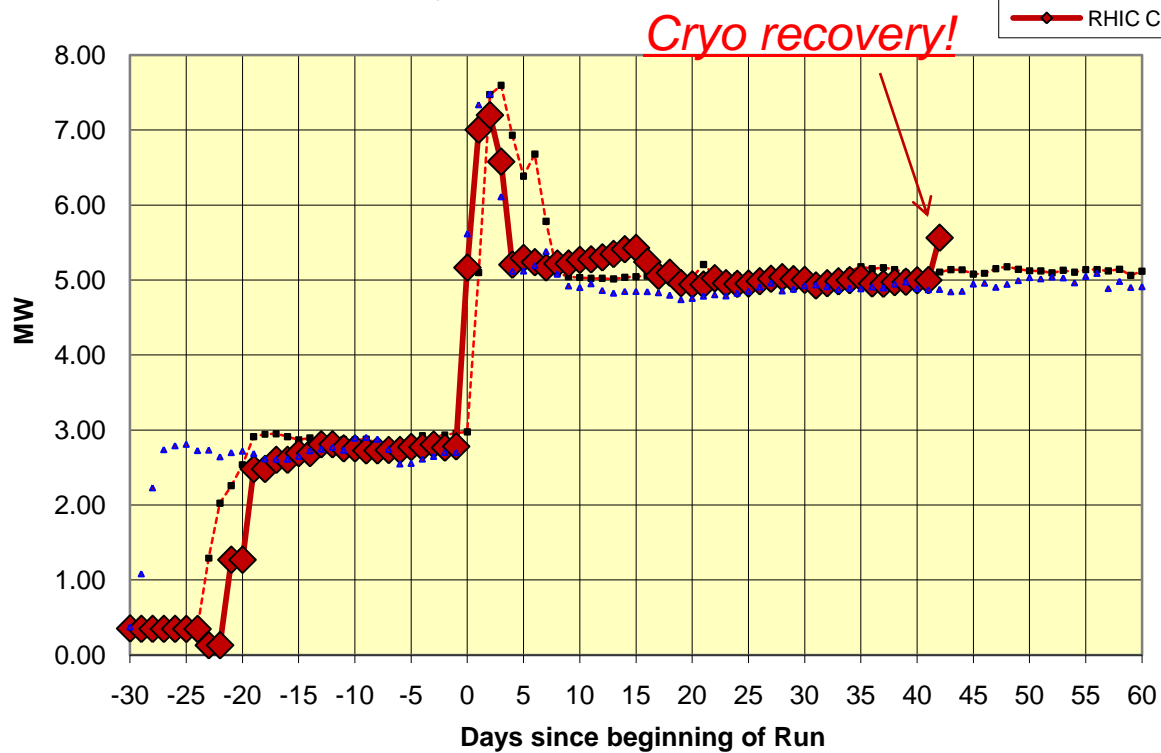
□ RhicIpmManager.blue\_vert;normEmitM[.] (C)

○ RhicIpmManager.yellow\_vert;normEmitM[.] (C)

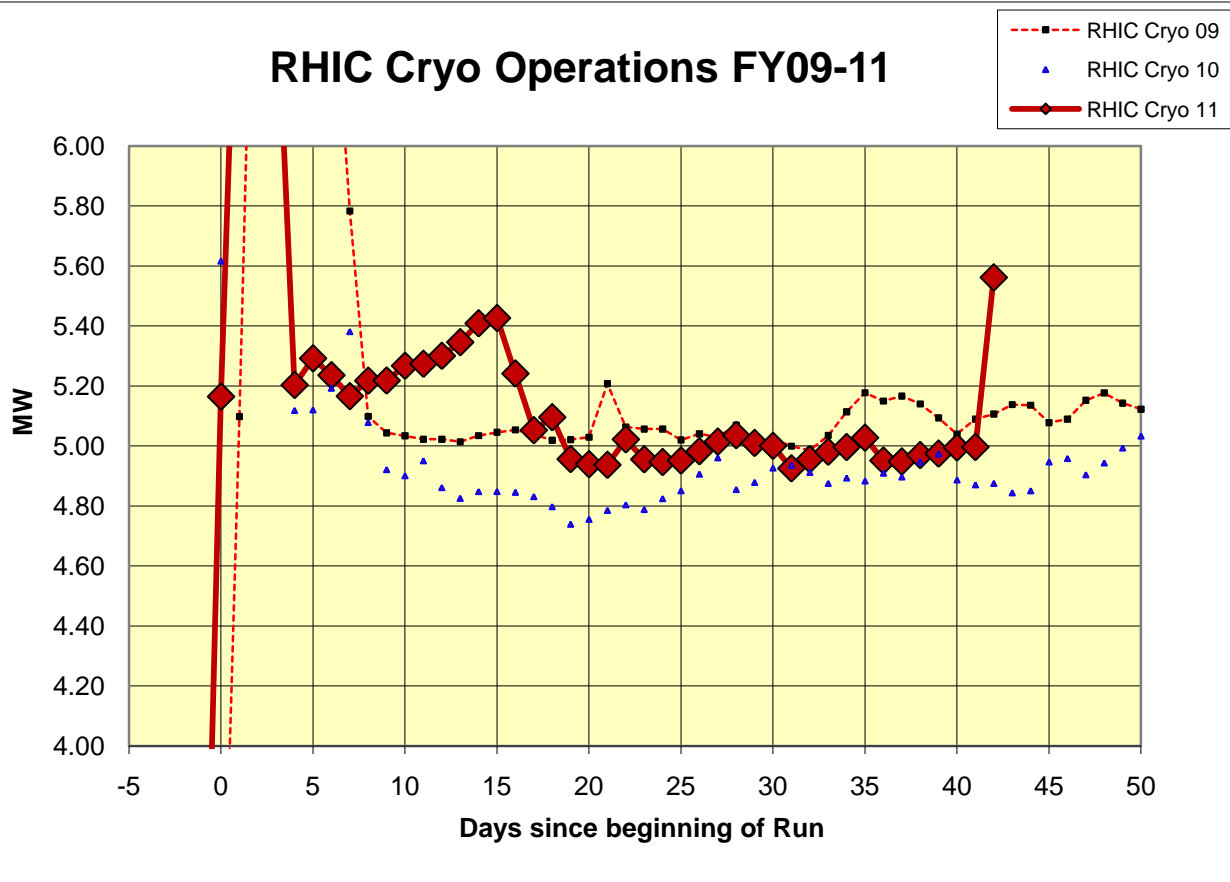
# RHIC Operations FY09-11



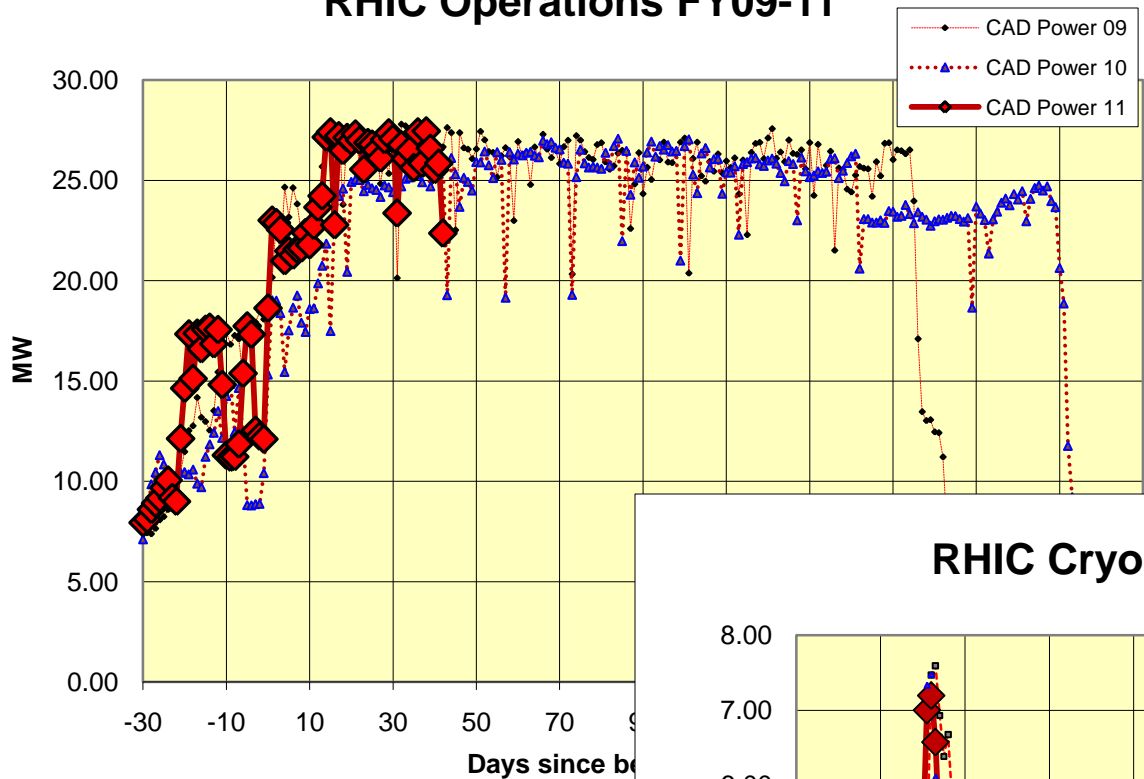
# RHIC Cryo Operations FY09-11



# RHIC Cryo Operations FY09-11

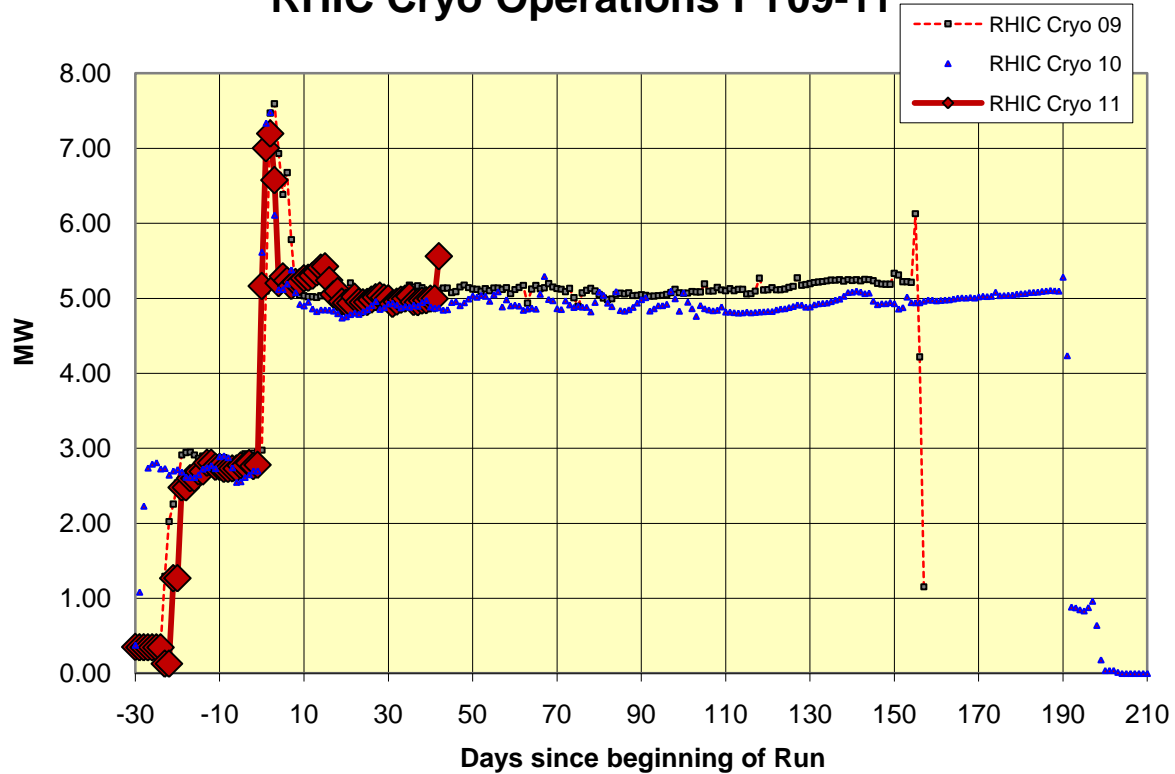


# RHIC Operations FY09-11



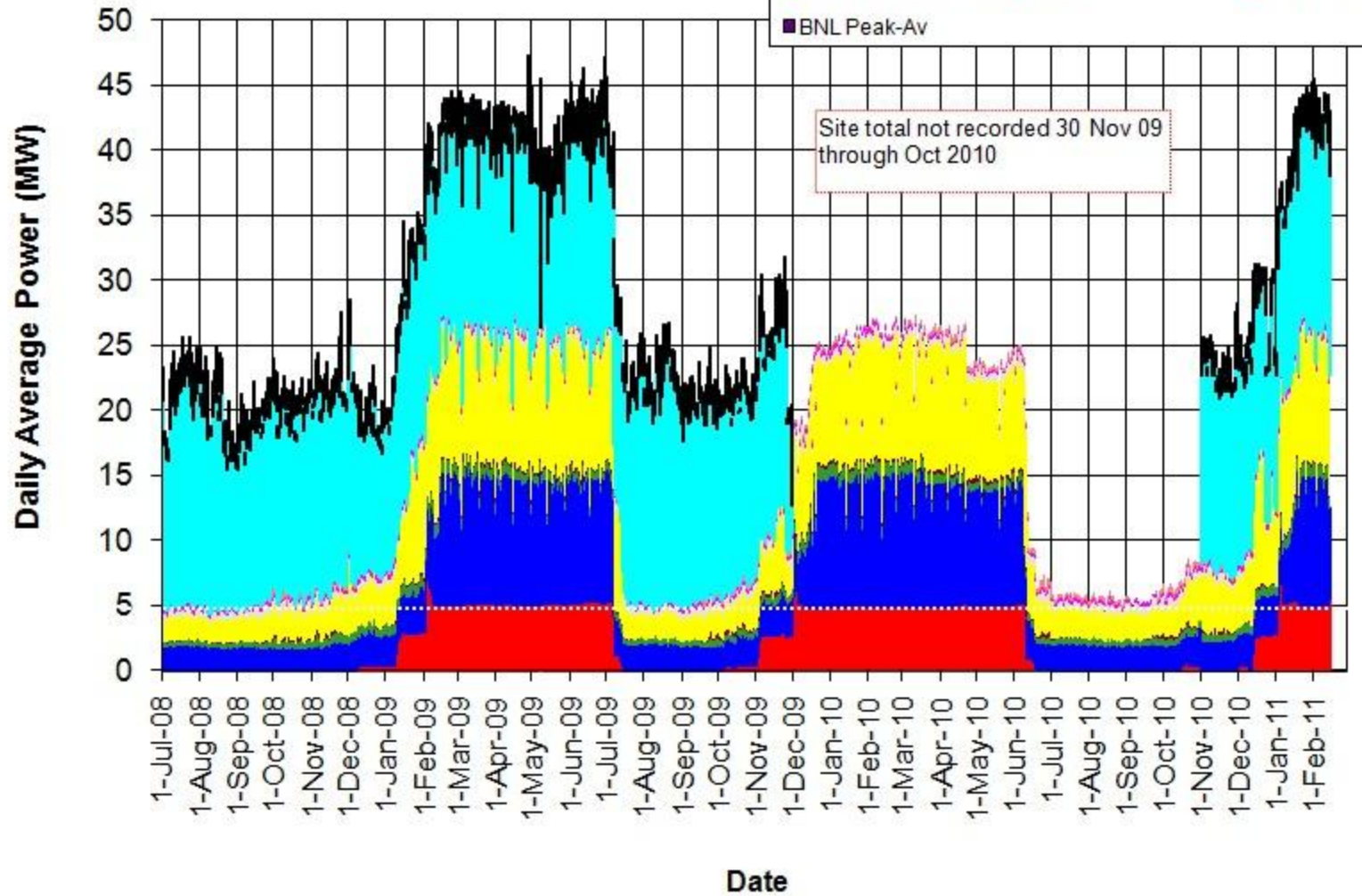
Through 14 Feb 2011

# RHIC Cryo Operations FY09-11



Through 14 Feb 2011

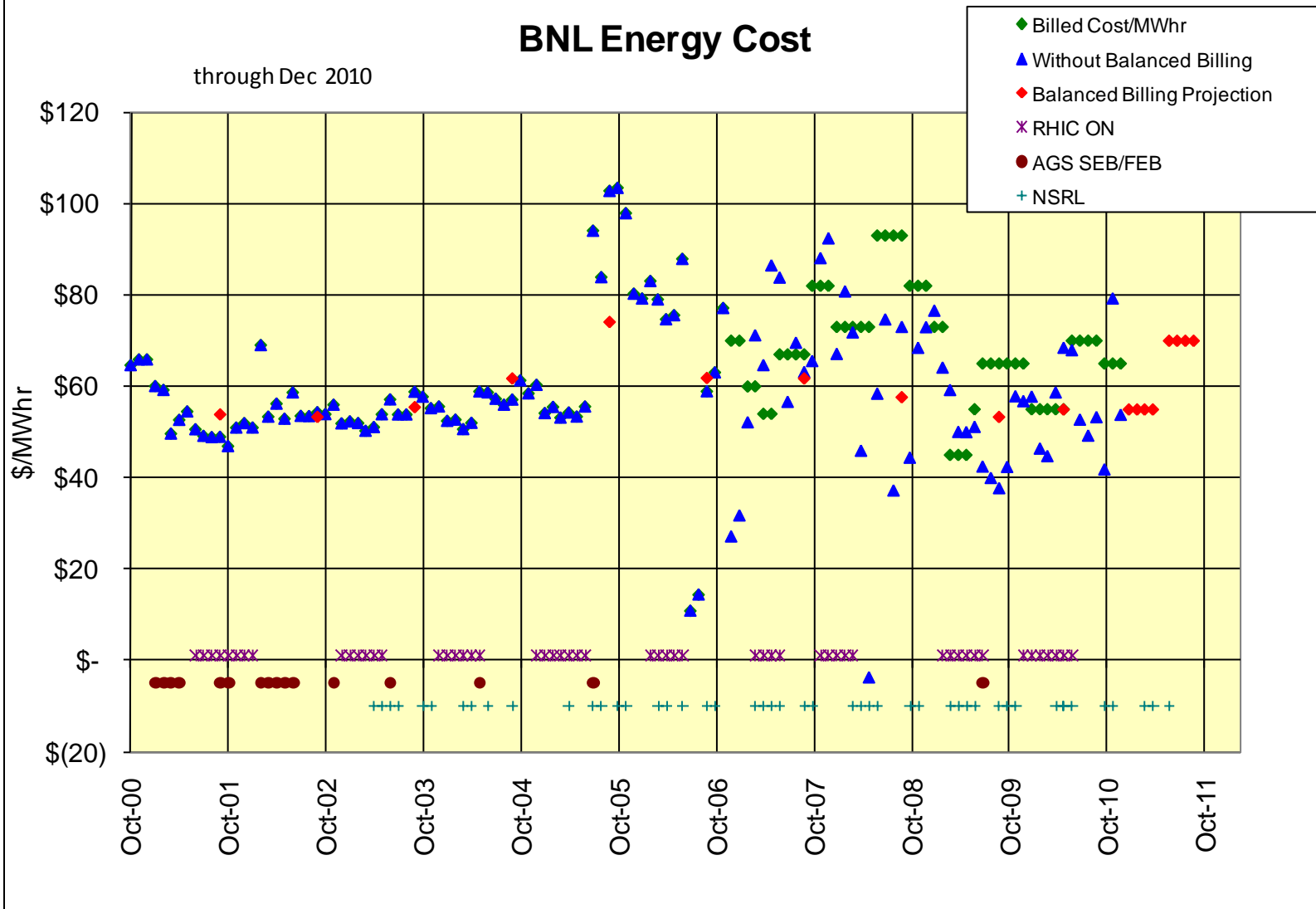
# BNL Energy Use FY 2009-11



**Old information**

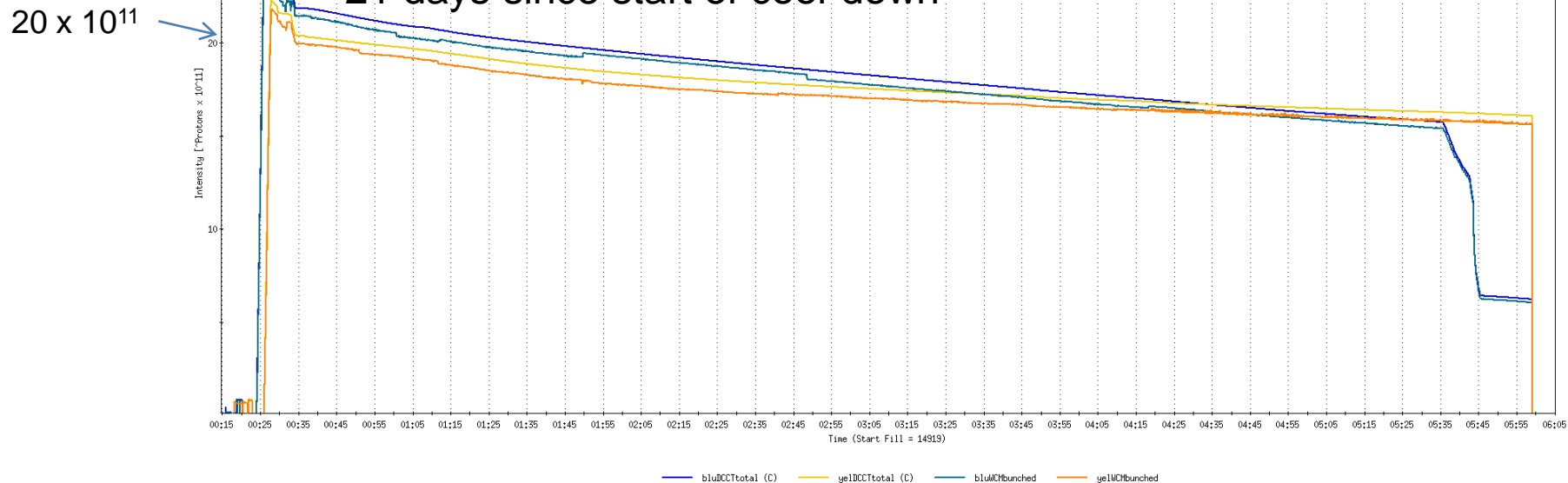
# BNL Energy Cost

through Dec 2010

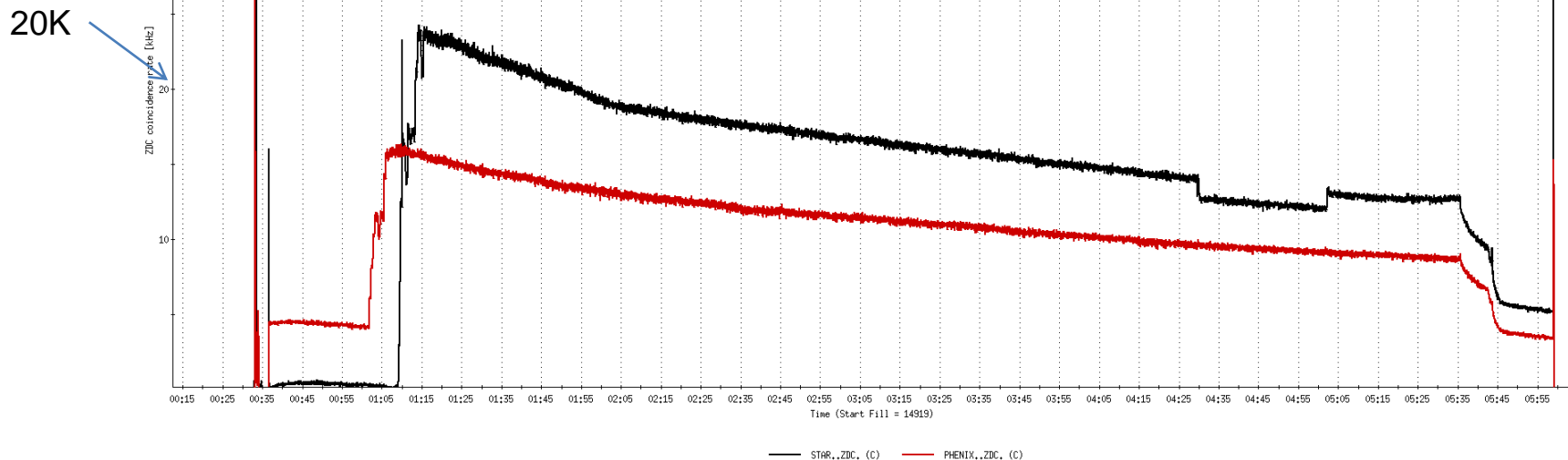


**Run 11**, First overnight store, Mon Jan 24 00:12  
Fill number 14919,,  $\sqrt{s}=500$  GeV  
21 days since start of cool-down

- 28 x 27 bunches
- $\beta^*=0.65$  meters



For peak store lumi =  $170 \times 10^{30} \text{ cm}^{-2}\text{s}^{-1}$  (projected MAXIMUM)  
ZDC Rate ~ 400K (assuming 2.4 mb n-pair xsection)





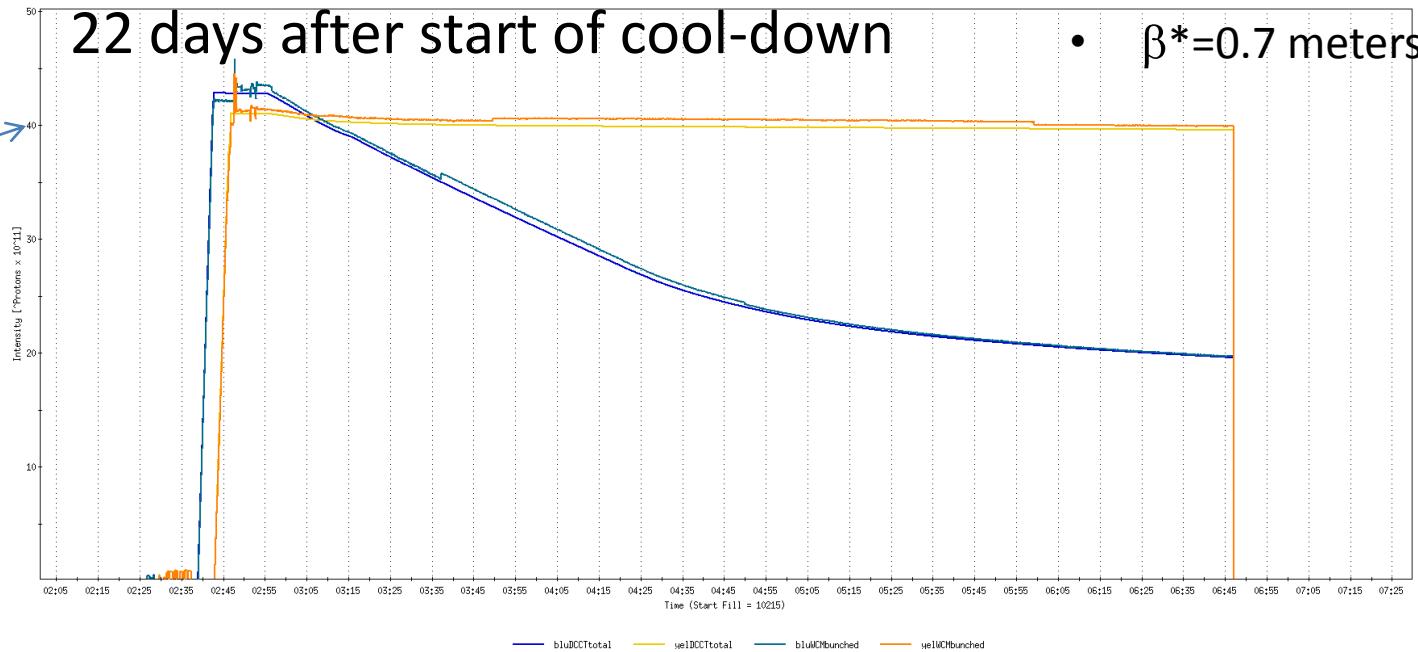
# Run 9, First overnight store at $\sqrt{s}=500$ GeV

• 56 x 56 bunches

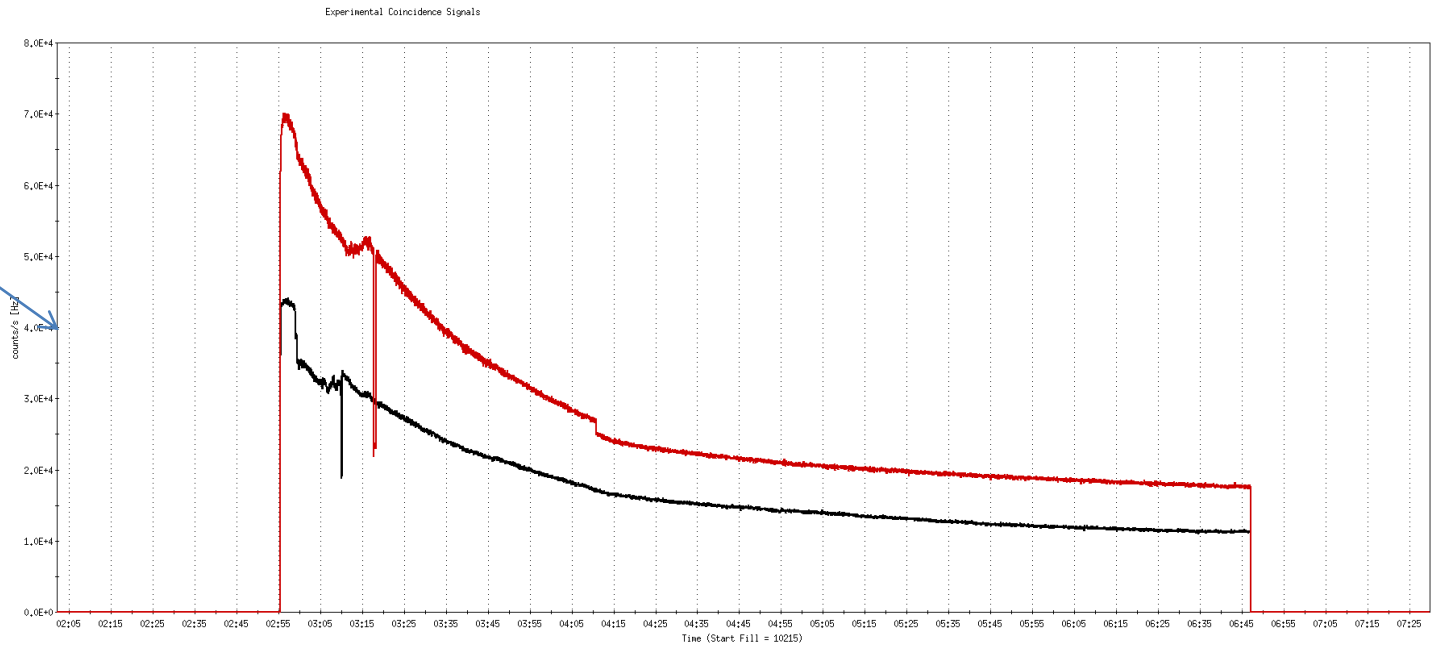
•  $\beta^*=0.7$  meters

## 22 days after start of cool-down

$40 \times 10^{11}$

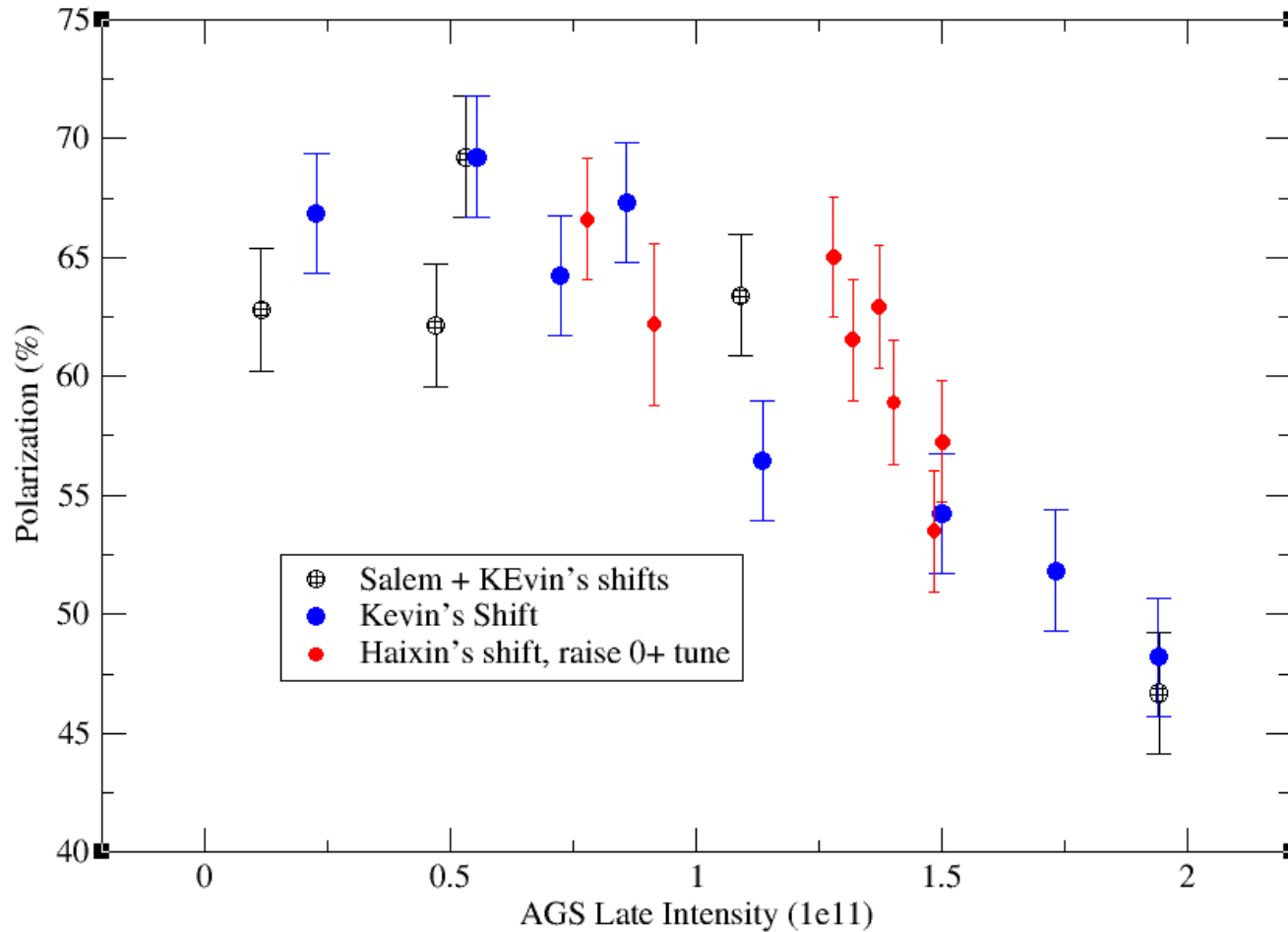


40K



G0: X, Y = [-0.402176, 34.134]

## AGS pp log, 23 Feb 09, 00:26

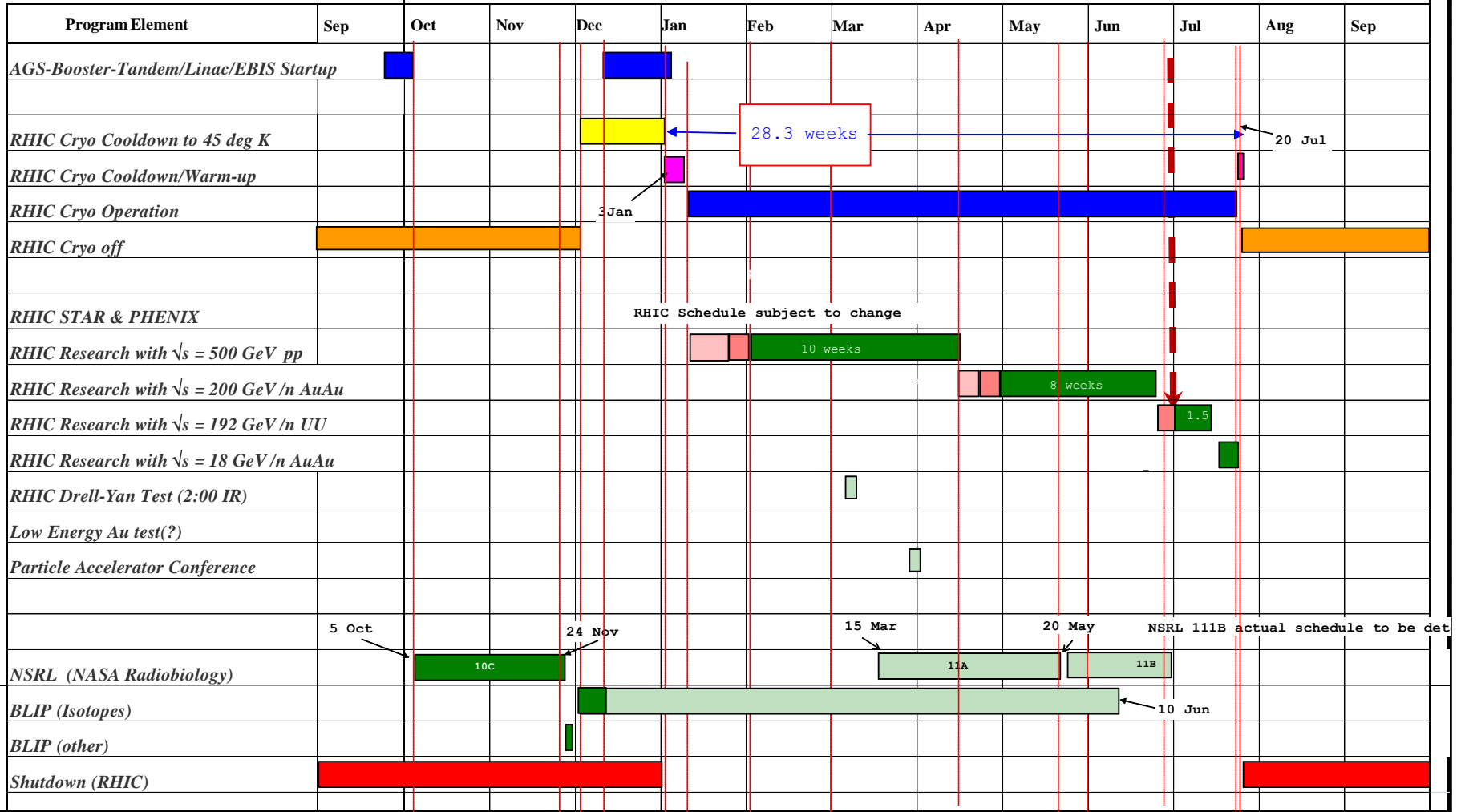


# C-A Operations-FY11

planned (budget permitting)

- concurrent with RHIC
- setup with beams
- ramp up luminosity

FY 2011



28.3 weeks

20 Jul

3Jan

RHIC Schedule subject to change

10 weeks

8 weeks

1.5

5 Oct

24 Nov

15 Mar

20 May

10c

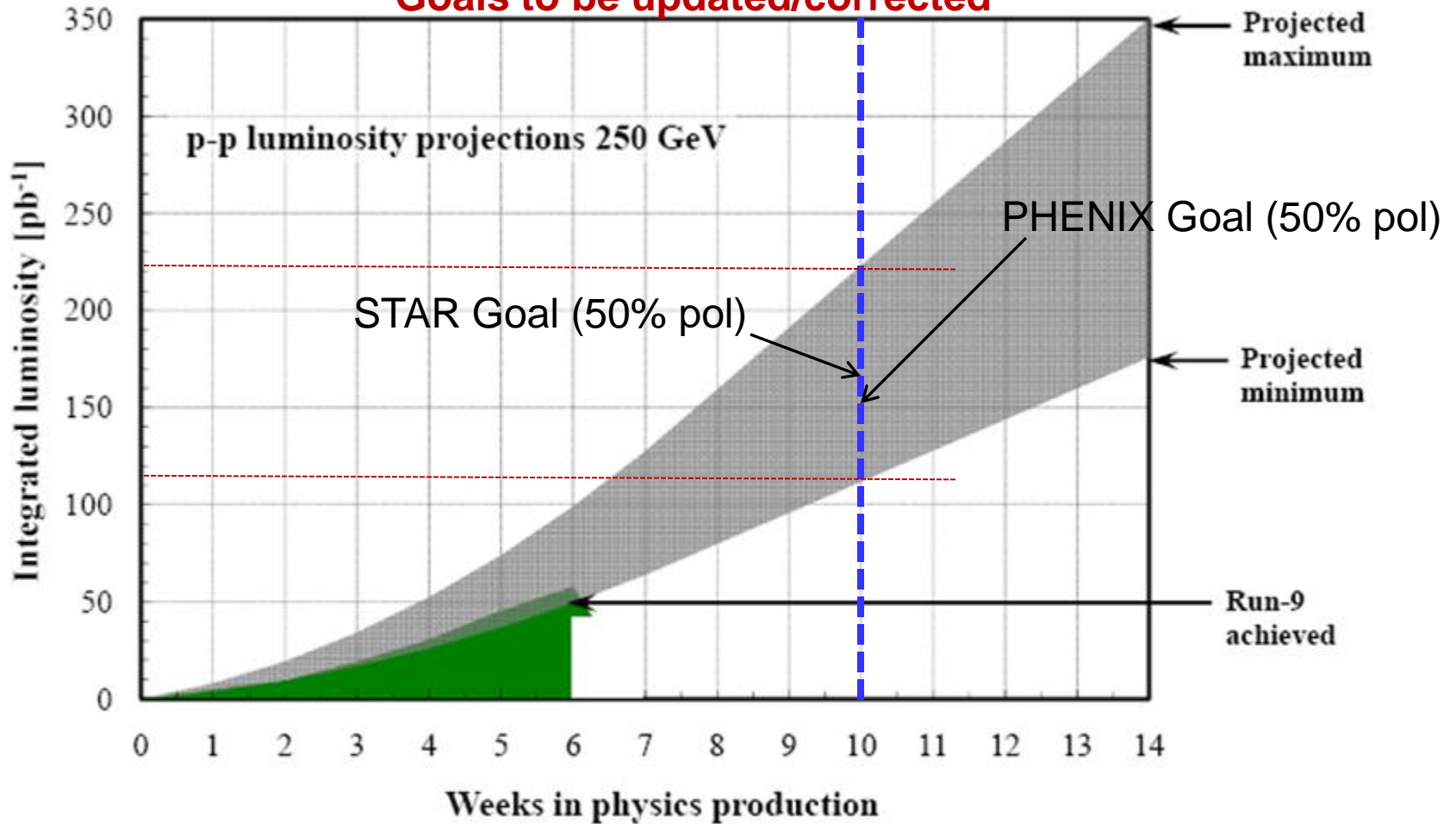
11A

11B

10 Jun

# Run-11 p<sup>↑</sup>-p<sup>↑</sup> luminosity projections

Goals to be updated/corrected

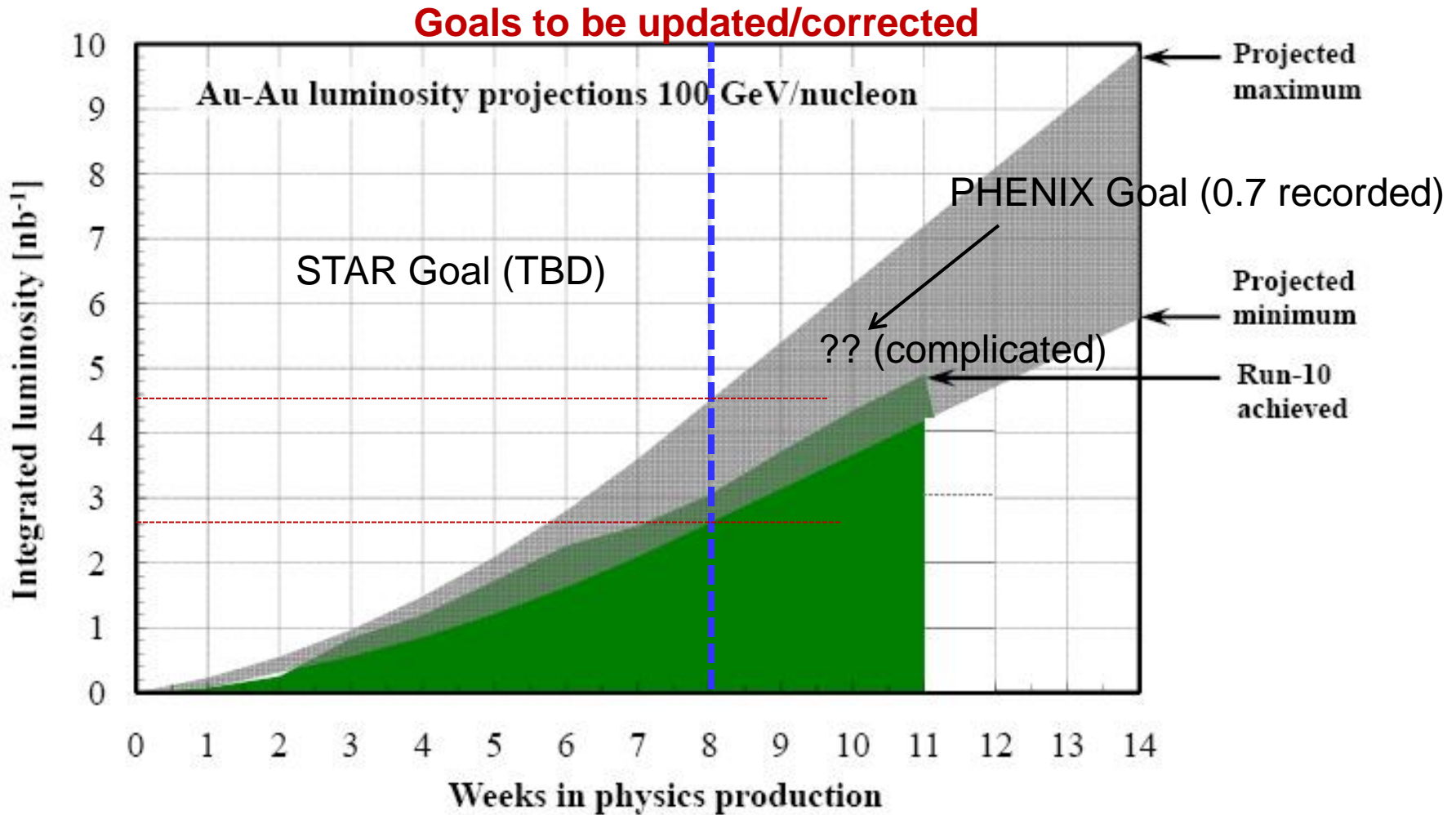


Assume 8 weeks to ramp-up for max.

Expect store  $P_{\text{avg}} = 35\text{-}50\%$ ,  $L_{\text{avg}}$  up to  $100 \times 10^{30} \text{cm}^{-2} \text{s}^{-1}$  (+80%).

[from Run-9 to max projection:  $\beta^* = 0.7 \rightarrow 0.6 \text{ m}$ ,  $N_b = 1.1 \rightarrow 1.4 \times 10^{11}$ ]

# Run-11 Au-Au luminosity projections 100 GeV/nucleon



Assume 6 weeks to ramp-up for min, and 8 weeks for max (stoch. cooling re-commissioning).

**Expect  $L_{\text{avg}}$  up to  $25 \times 10^{26} \text{cm}^{-2} \text{s}^{-1}$  (+25%).**

**[from Run-10 to max:  $\beta^* = 0.75 \rightarrow 0.65$  m,  $N_b = 1.1 \rightarrow 1.1 \times 10^9$ , more cooling]**