

RUN 11 RHIC MACHINE/EXPERIMENTS MEETING

8 Mar 2011

Agenda:

- Status – cryo and other

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.
- 2/25/2011: Beginning with physics store 15239, changed CNI Polarimeter analyzing power to agree with jet target polarization measurements ...18% lower than before.

Run 11 Plan based on PAC recommendation/ALD Guidance and 28.3 weeks cryo operation 3/8/10 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, 1st maint day
- ~~27~~ 24 Jan, 1 week Ramp-up with 8 hr/night beam to experiments
- ~~3~~ **11 Feb (machine and ~experiments), begin 10(?) week physics run ($\sqrt{s} = 500$ GeV pp)**
- 16 Feb, AGS Jump Quads in routine operation for RHIC injection
- 24 Feb, 9 MHz cavity in routine operation
- 7 March, cryo troubles, extended maintenance
- ~~4~~ **18 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)

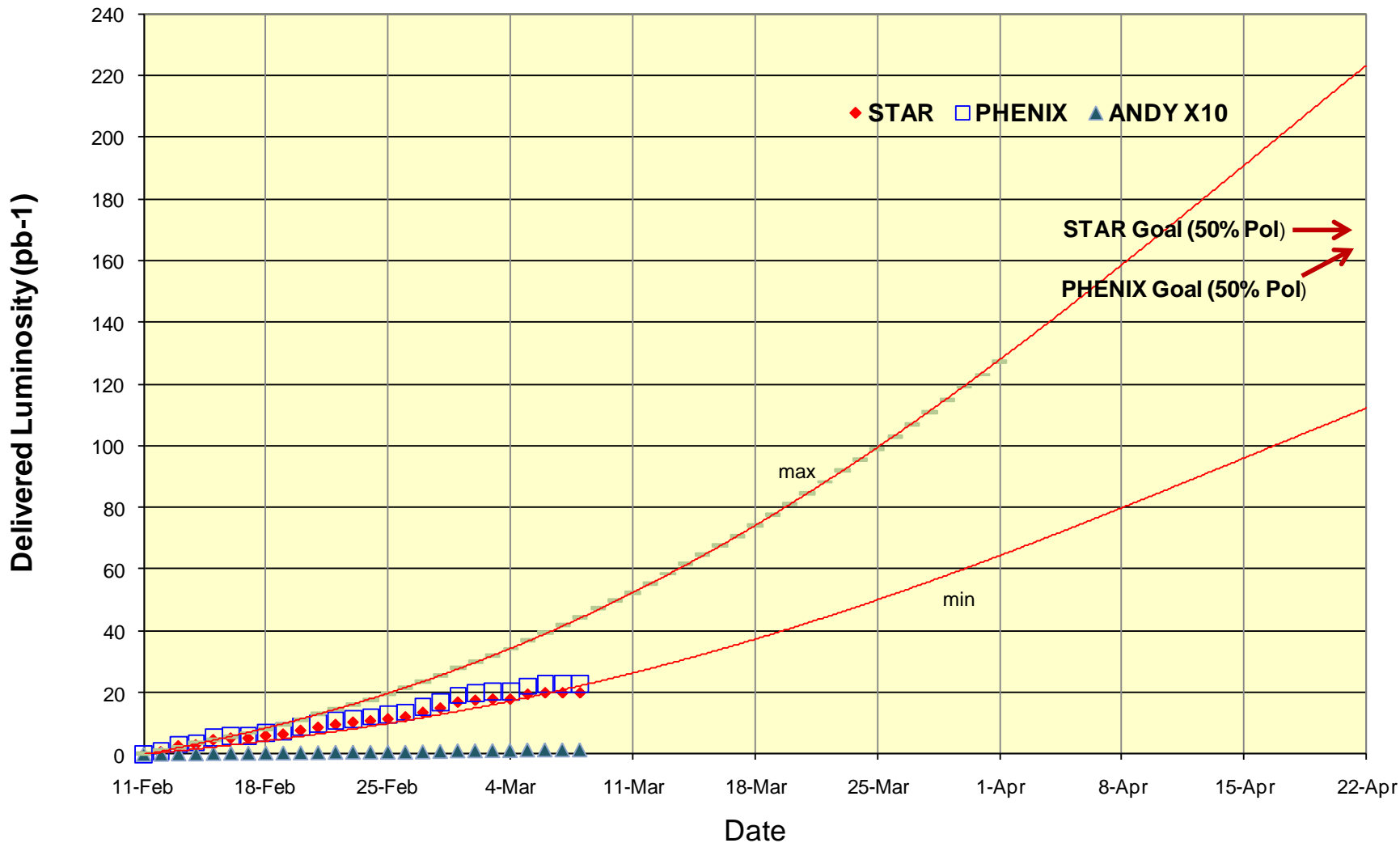
Possible additions:

- Low energy test run

Run 11 250 x 250 GeV pp, Luminosity

thru fill 15287, 8 Mar

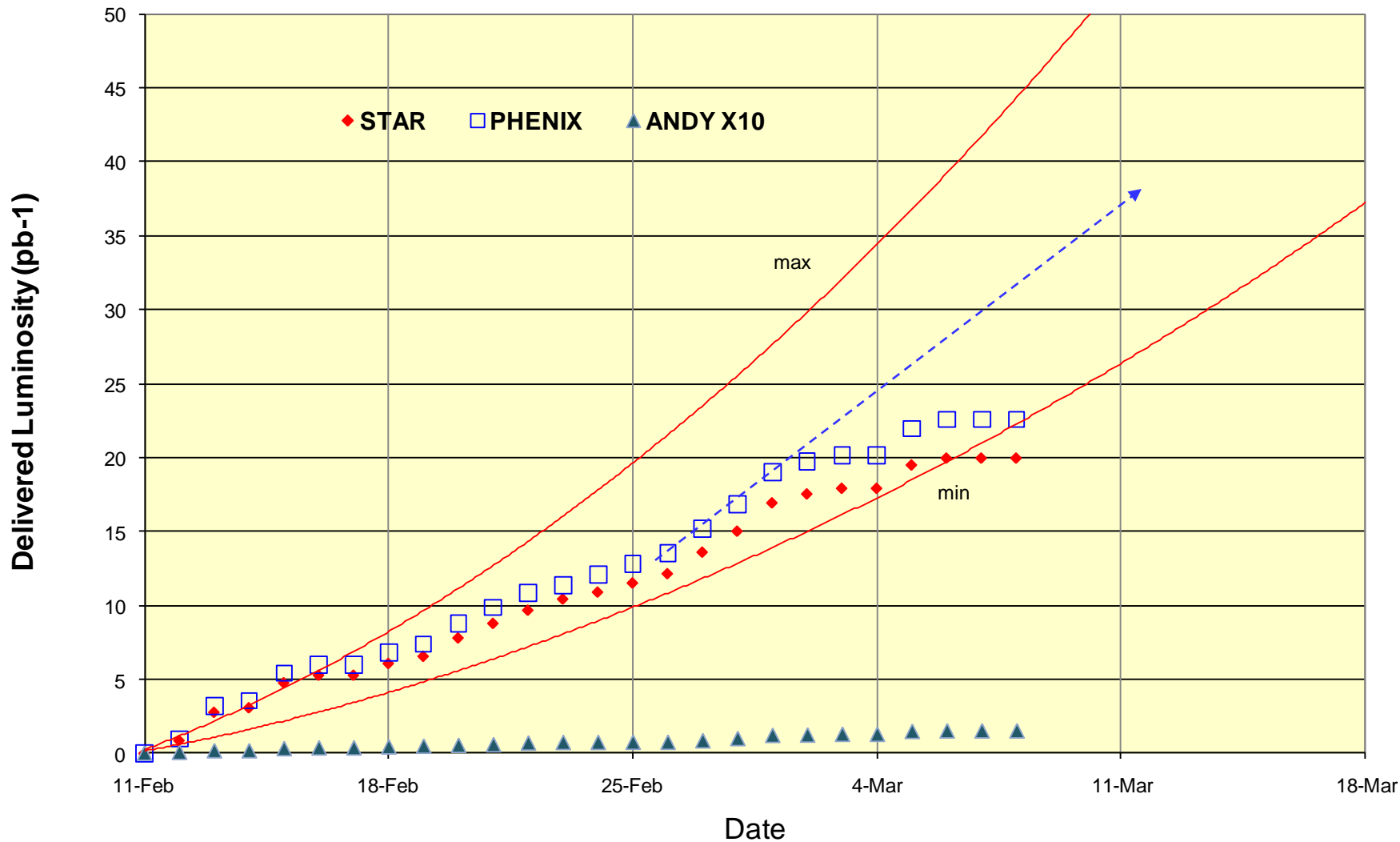
2.9 mb STAR, 2.7 mb PHENIX, 2.8 mb (not right) ANDY



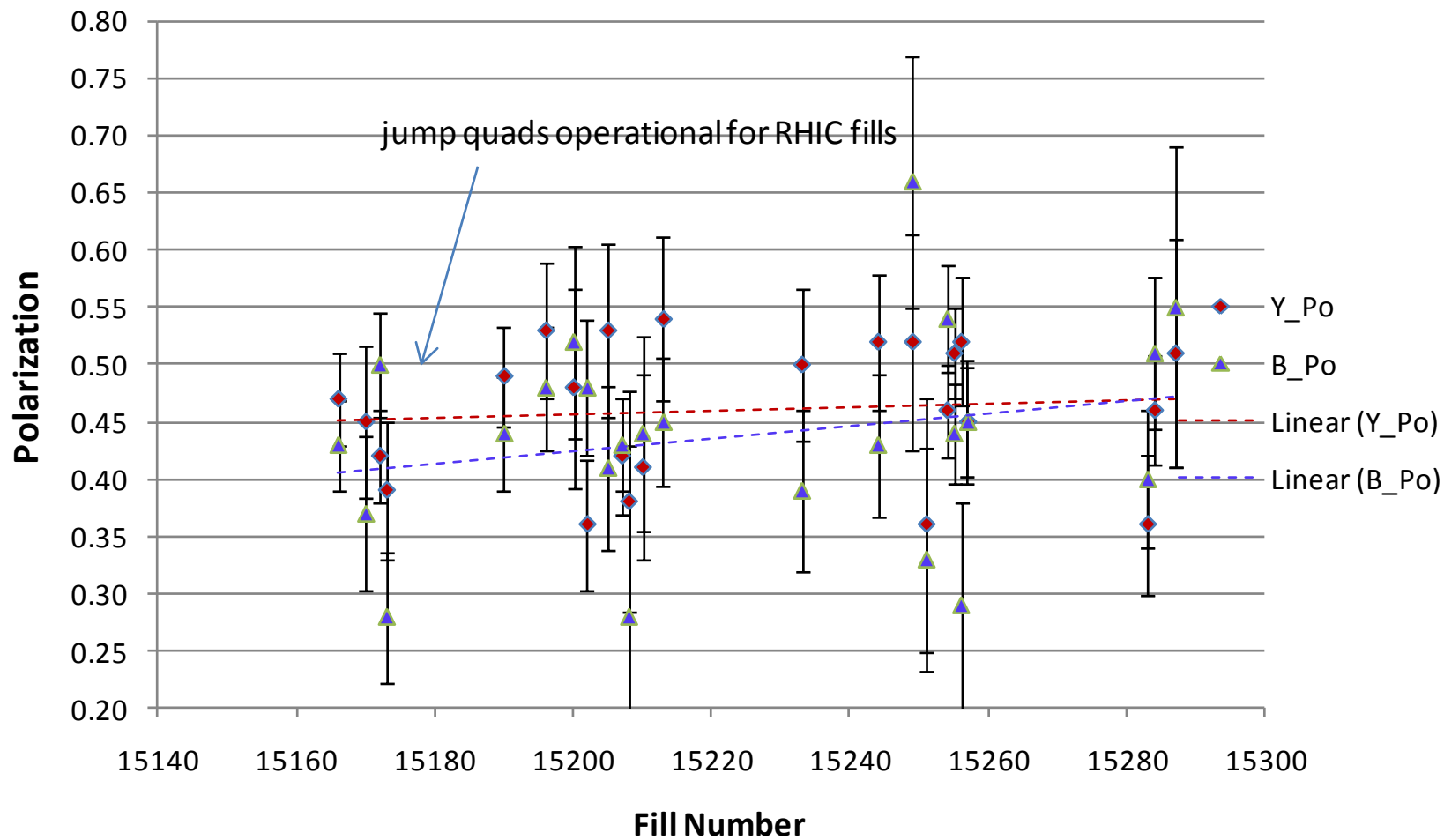
thru fill 15287, 8 Mar

Run 11 250 x 250 GeV pp, Luminosity

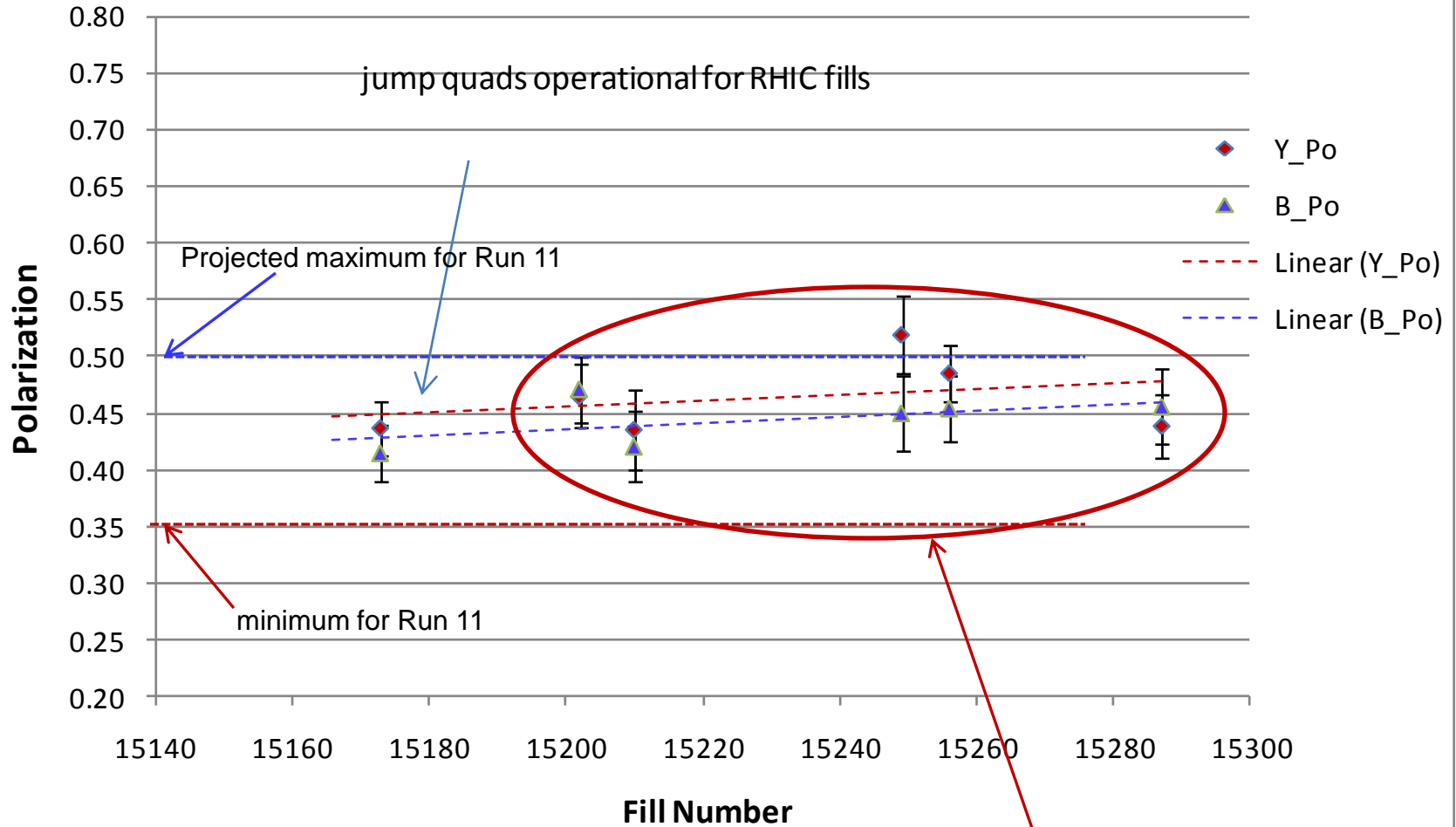
2.9 mb STAR, 2.7 mb PHENIX, 2.8 mb (not right) ANDY



Run 11 polarization as measured with the jet target



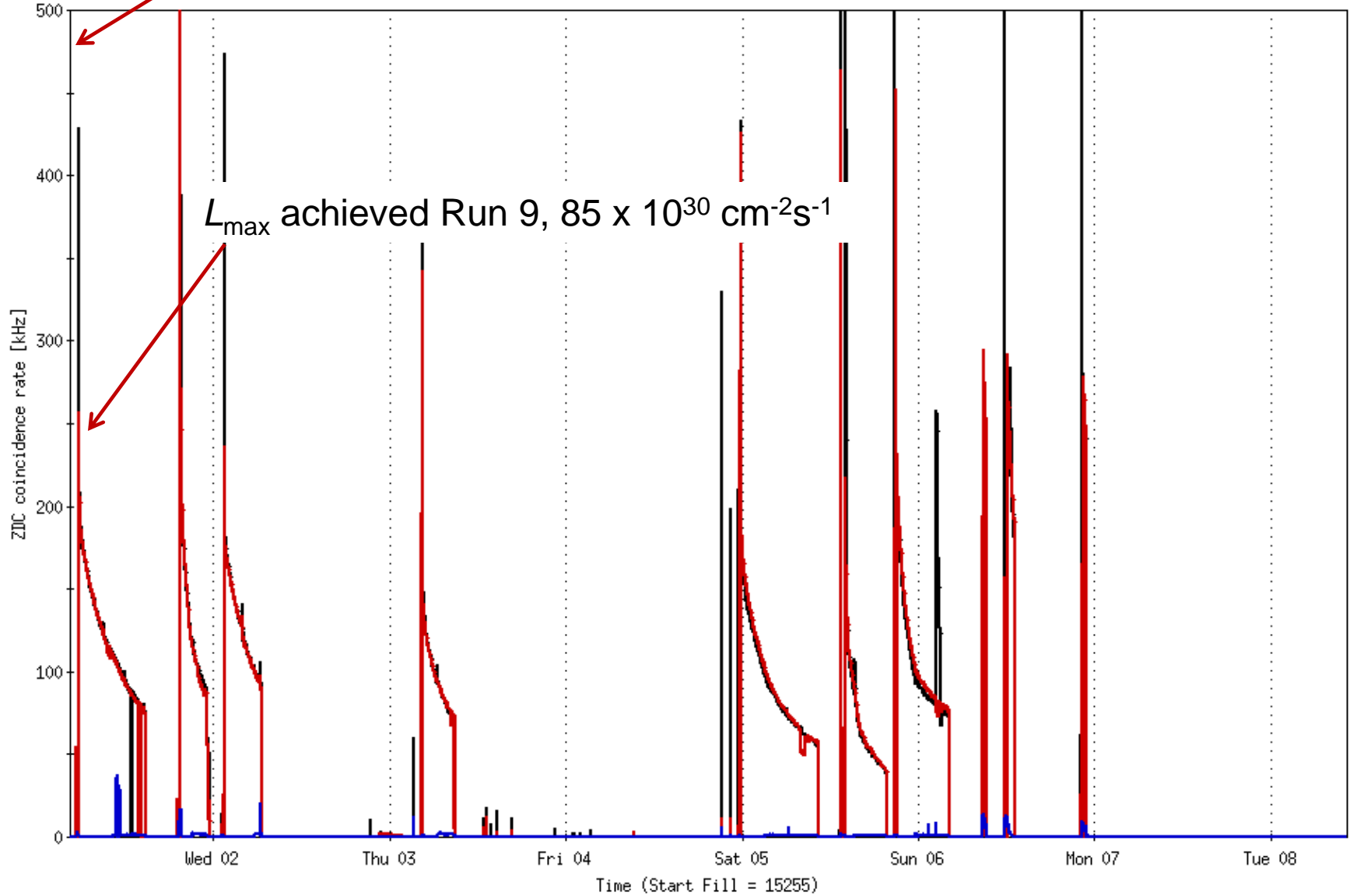
Run 11 polarization as measured with (4 fill average)



Blue average = $45.1 \pm 1.4\%$
Yellow Average = $46.9 \pm 1.3\%$

Physics Stores 15255 through 15288

$L_{\max} = 170 \times 10^{30} \text{ cm}^{-2}\text{s}^{-1}$ (projection with 2.8 mb xsection)

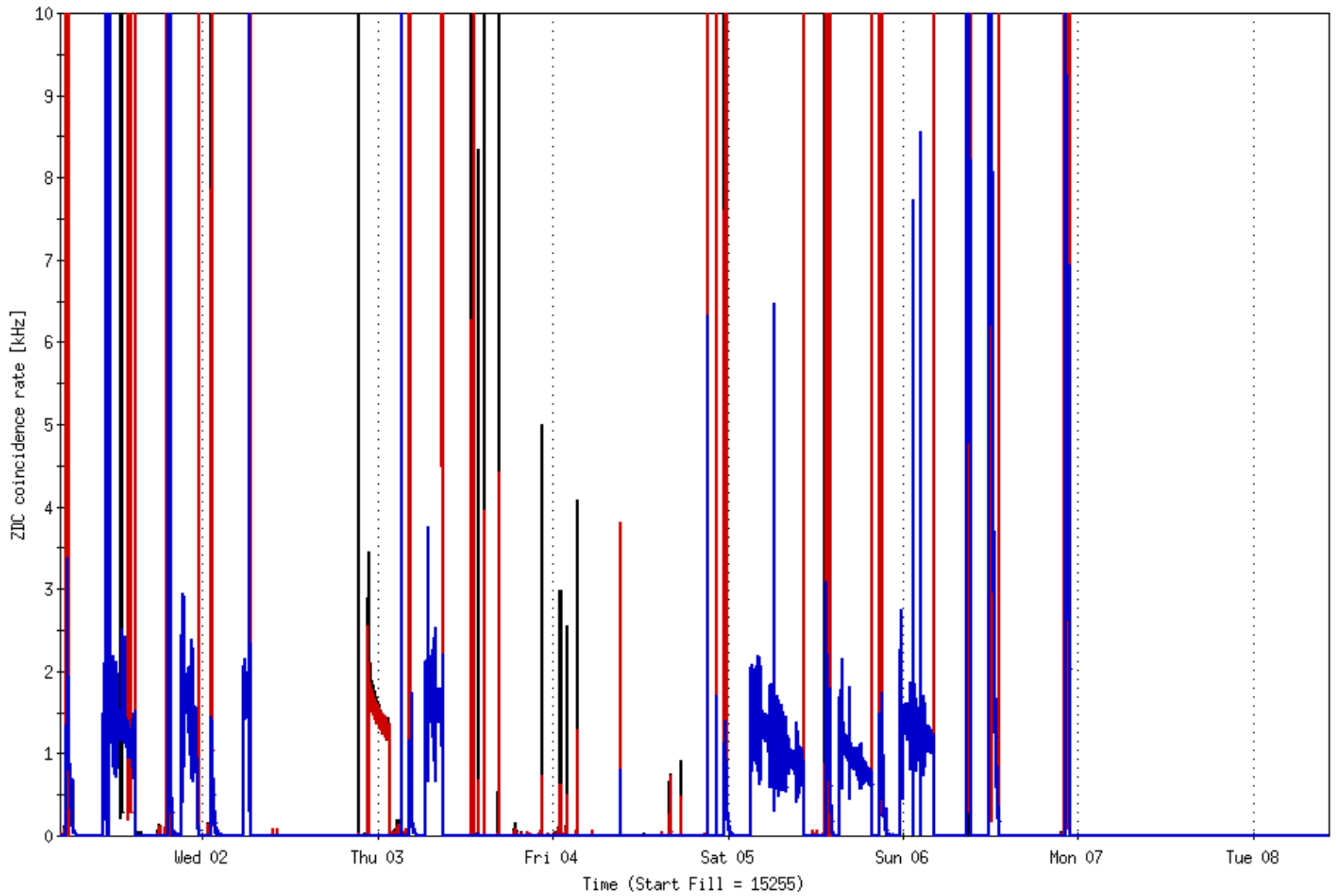


— STAR..ZDC. (C)

— PHENIX..ZDC. (C)

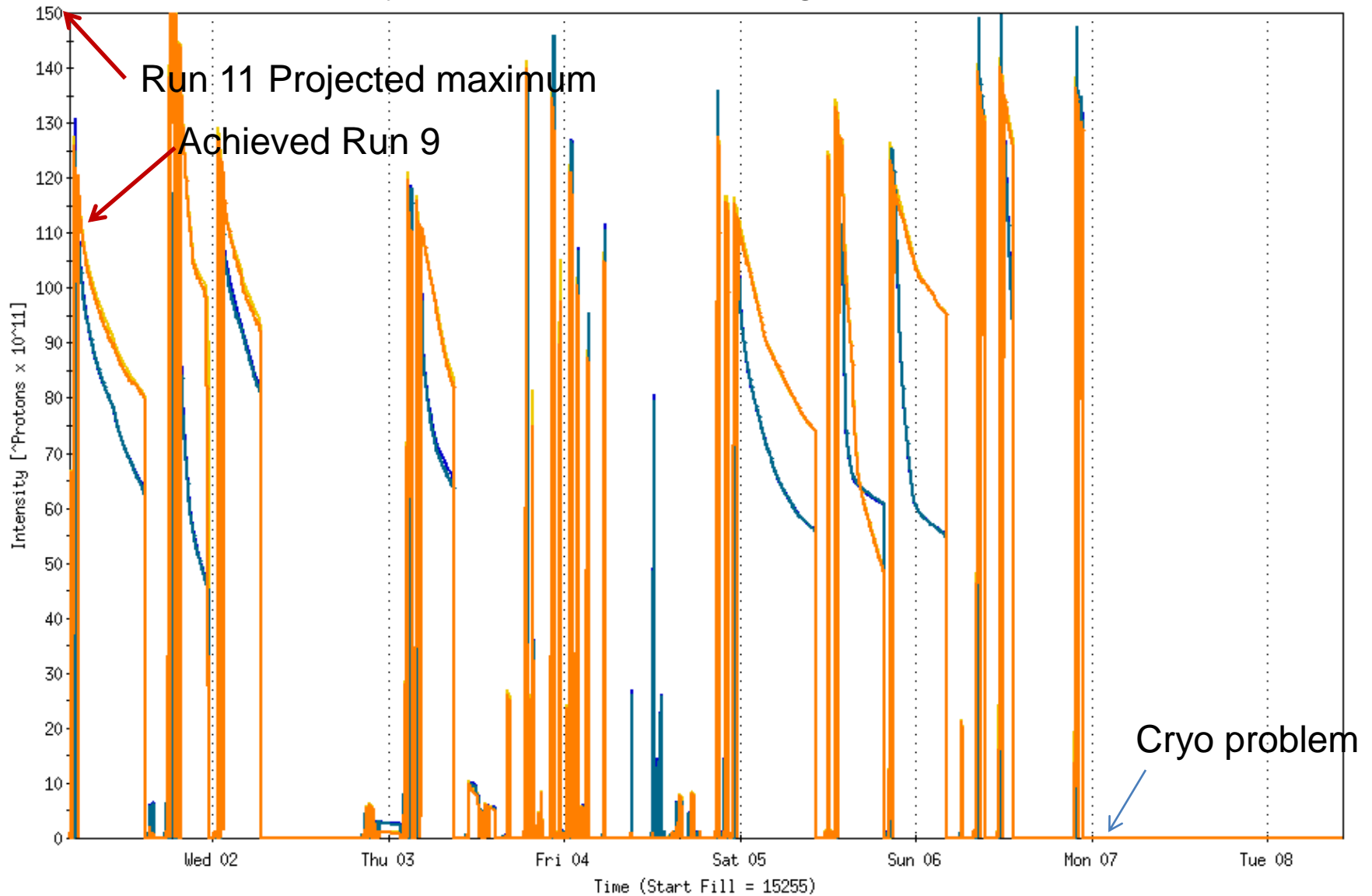
— AnDy..ZDC. (C)

Experimental Coincidence Signals



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

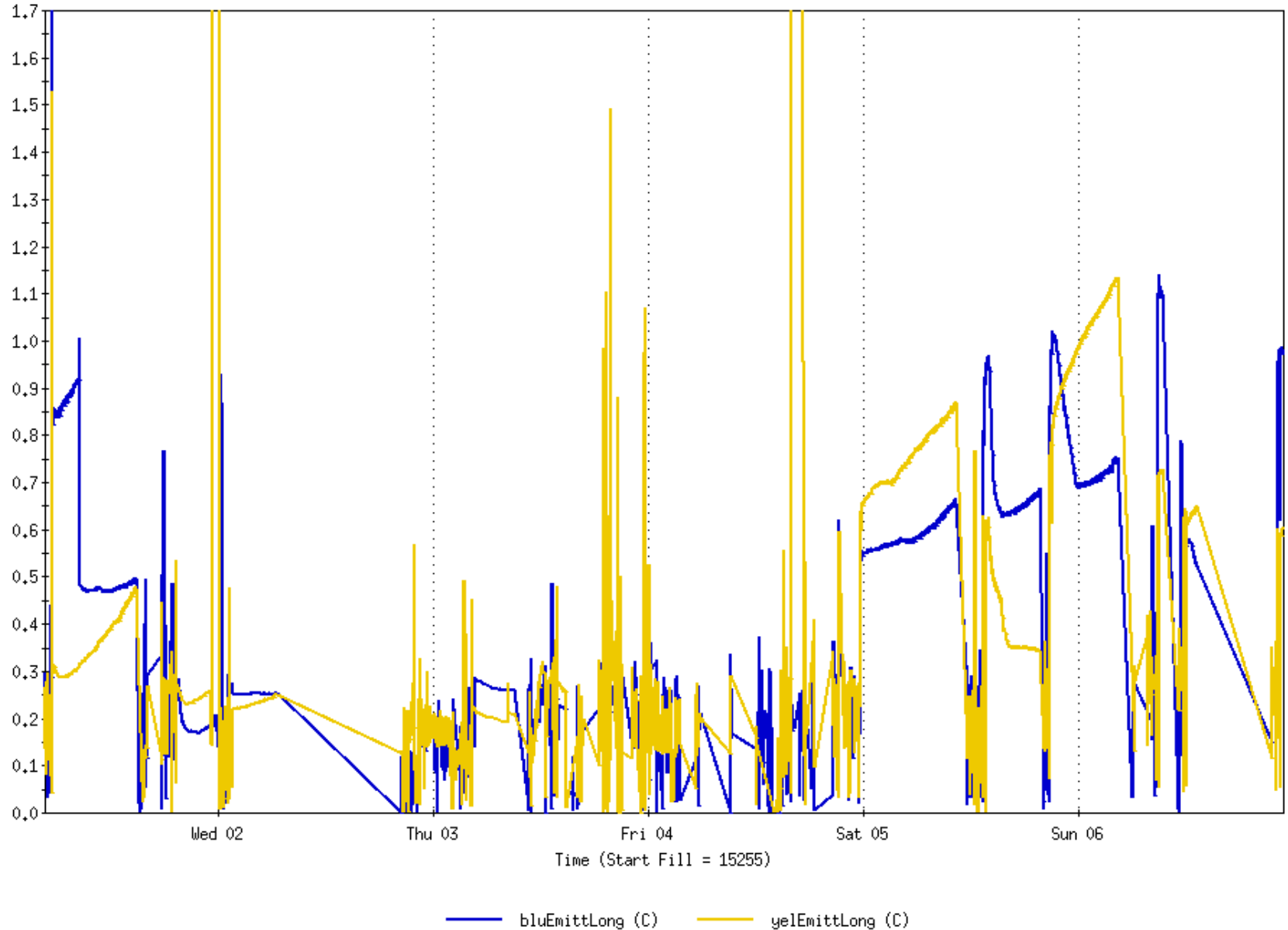
Physics Stores 15255 through 15288



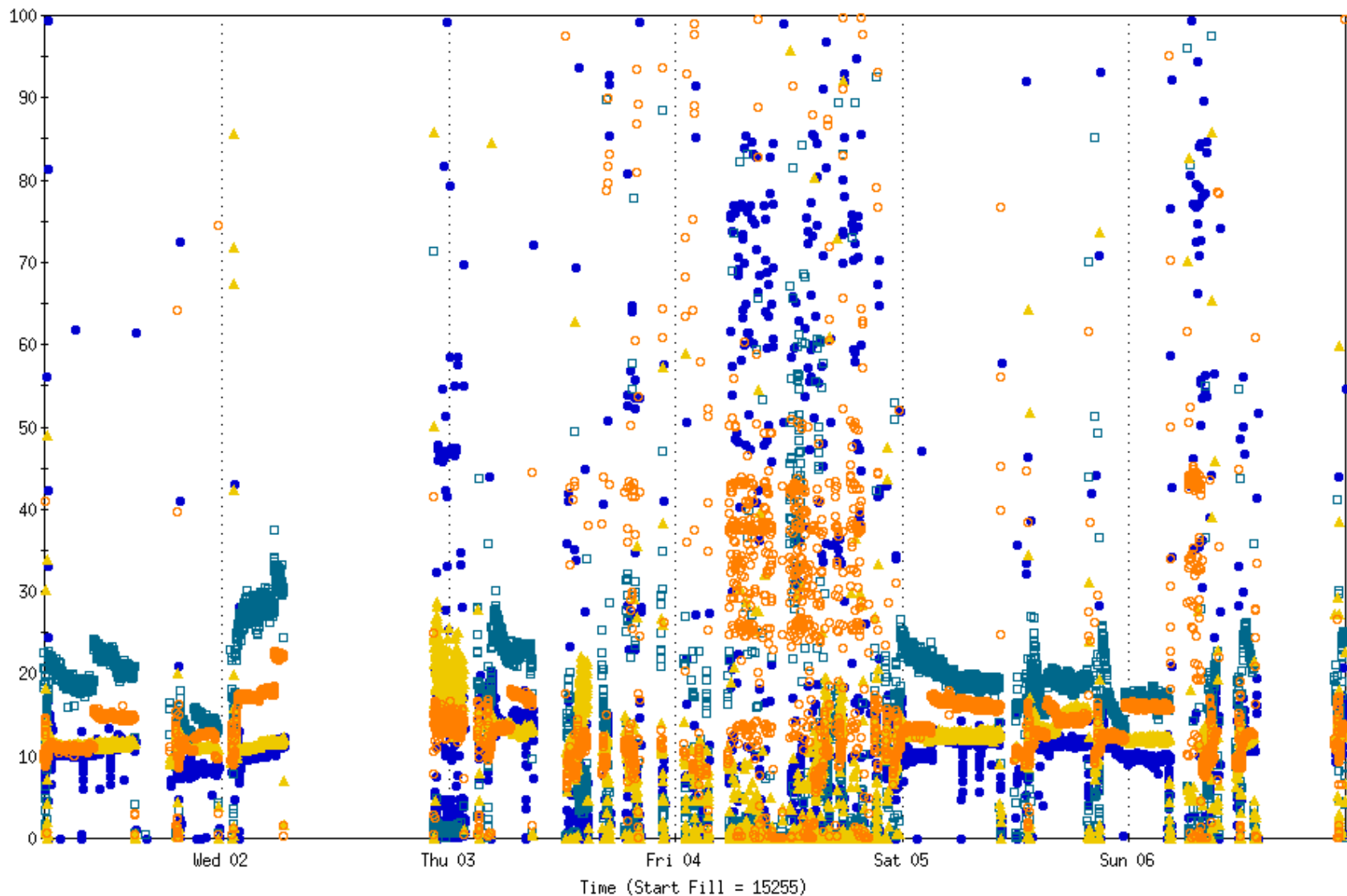
bluDCCTtotal (C) yeIDCCTtotal (C) bluWCMbunched (C) ye1WCMbunched (C)

Physics Stores 15255 through 15288

Longitudinal emittance as determined from WCM

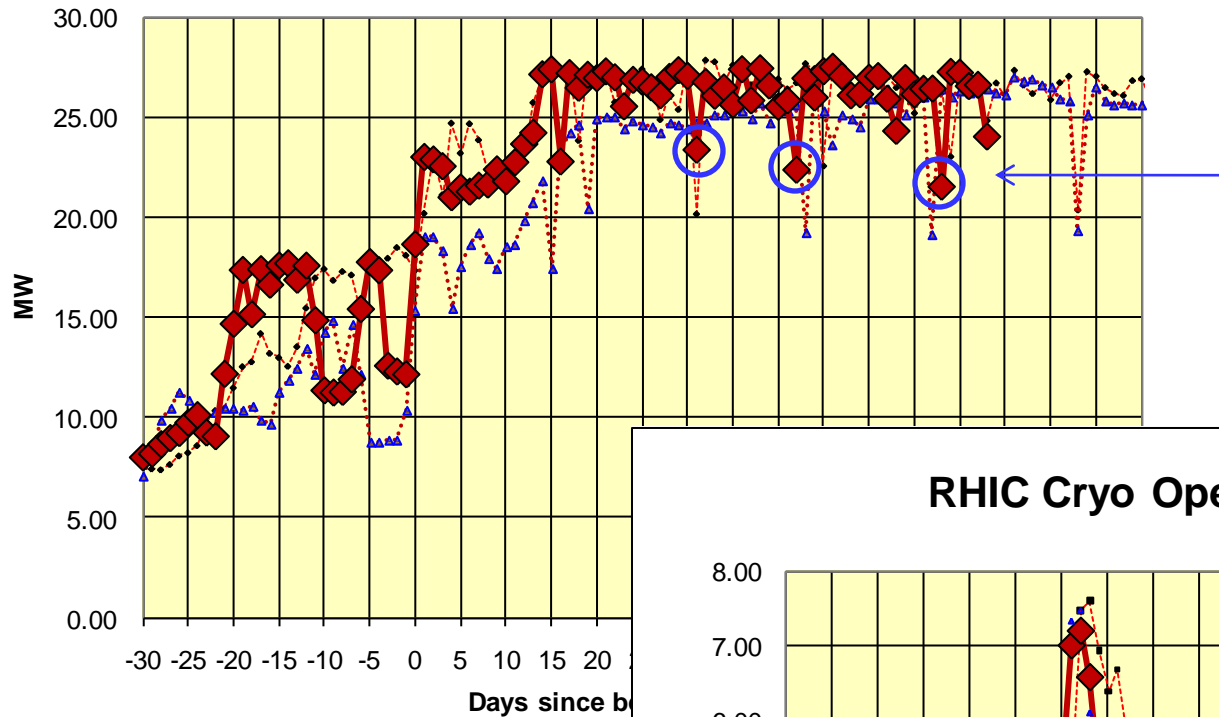


Physics Stores 15255 through 15288

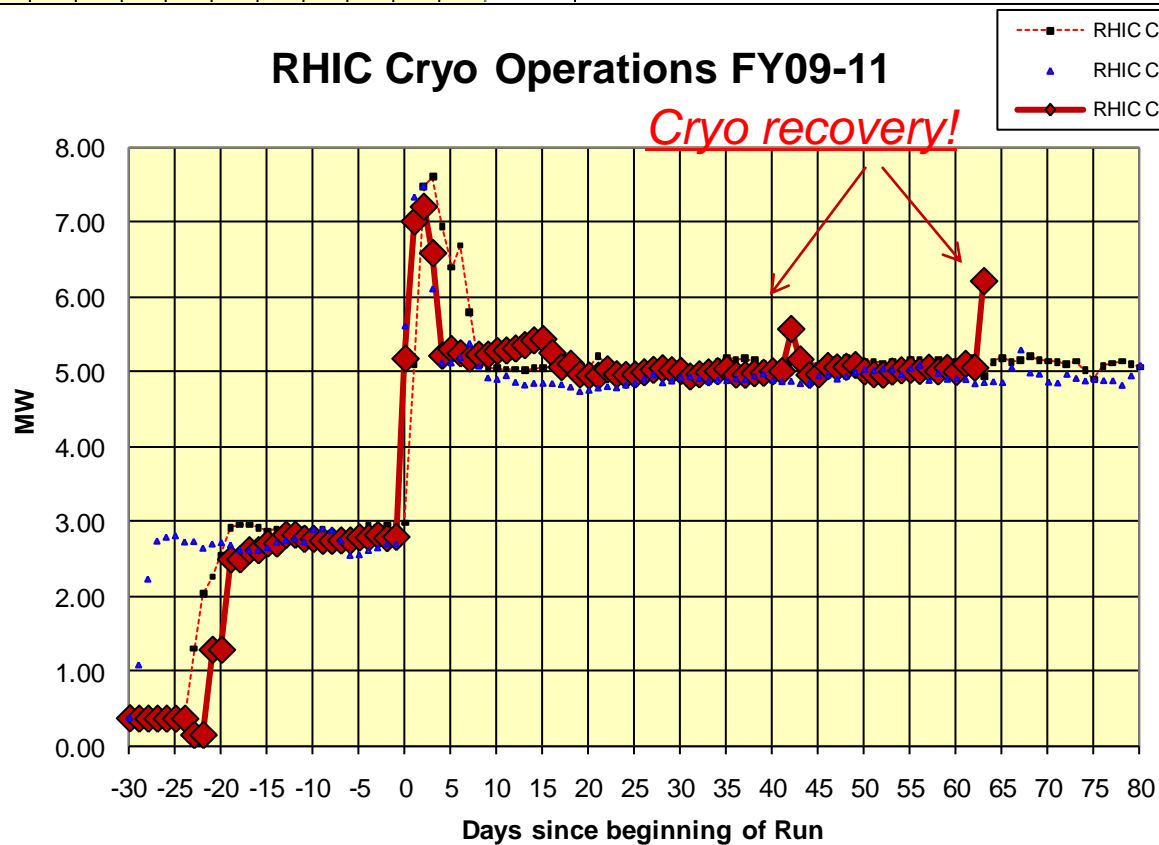


—●— RhicIpmManager.blue_horiz;normEmitM[.] —□— RhicIpmManager.blue_vert;normEmitM[.]
—▲— RhicIpmManager.yellow_horiz;normEmitM[.] —○— RhicIpmManager.yellow_vert;normEmitM[.]

RHIC Operations FY09-11

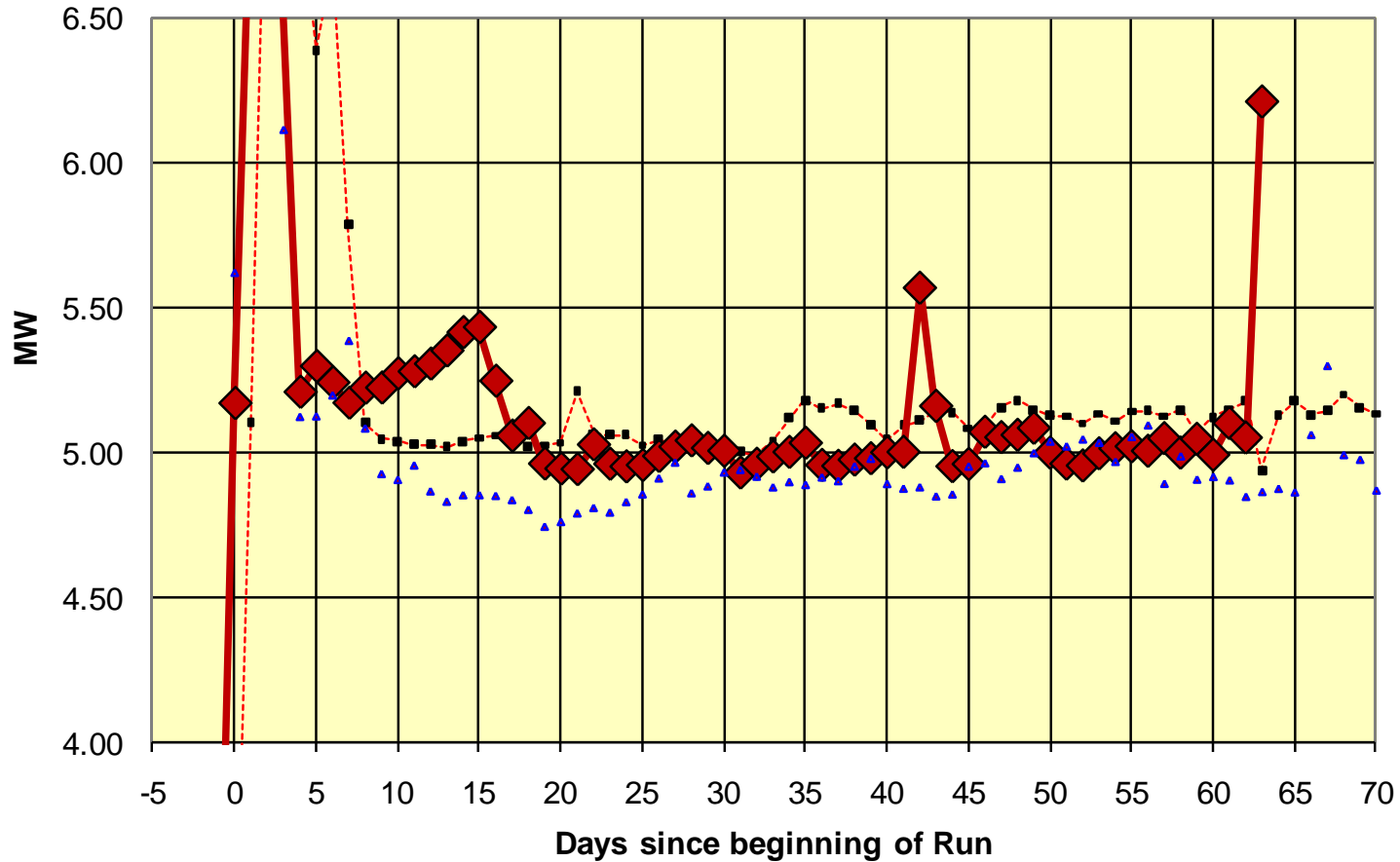
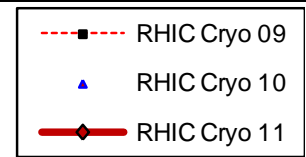


RHIC Cryo Operations FY09-11

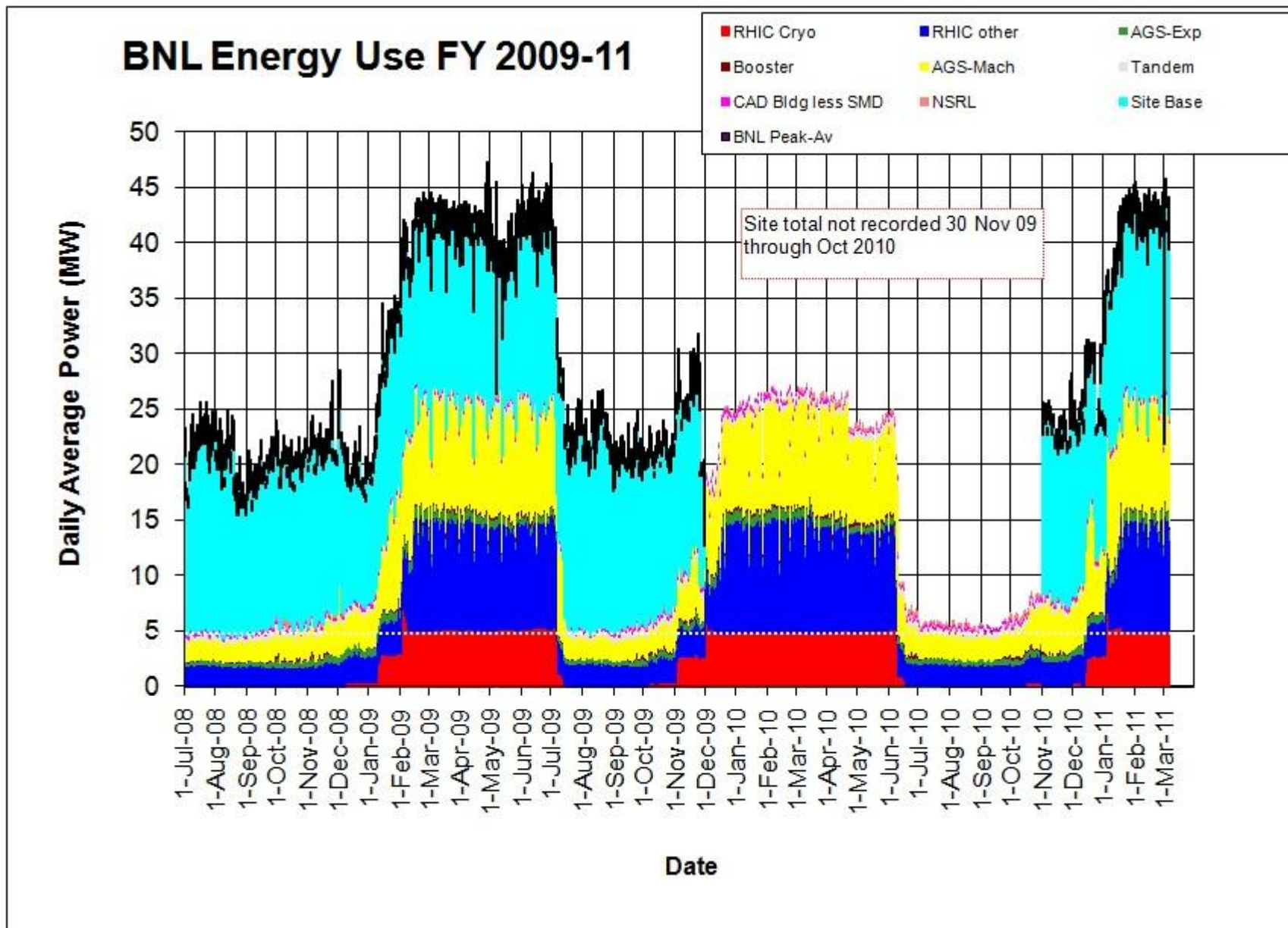


Through 7 Mar 2011

RHIC Cryo Operations FY09-11



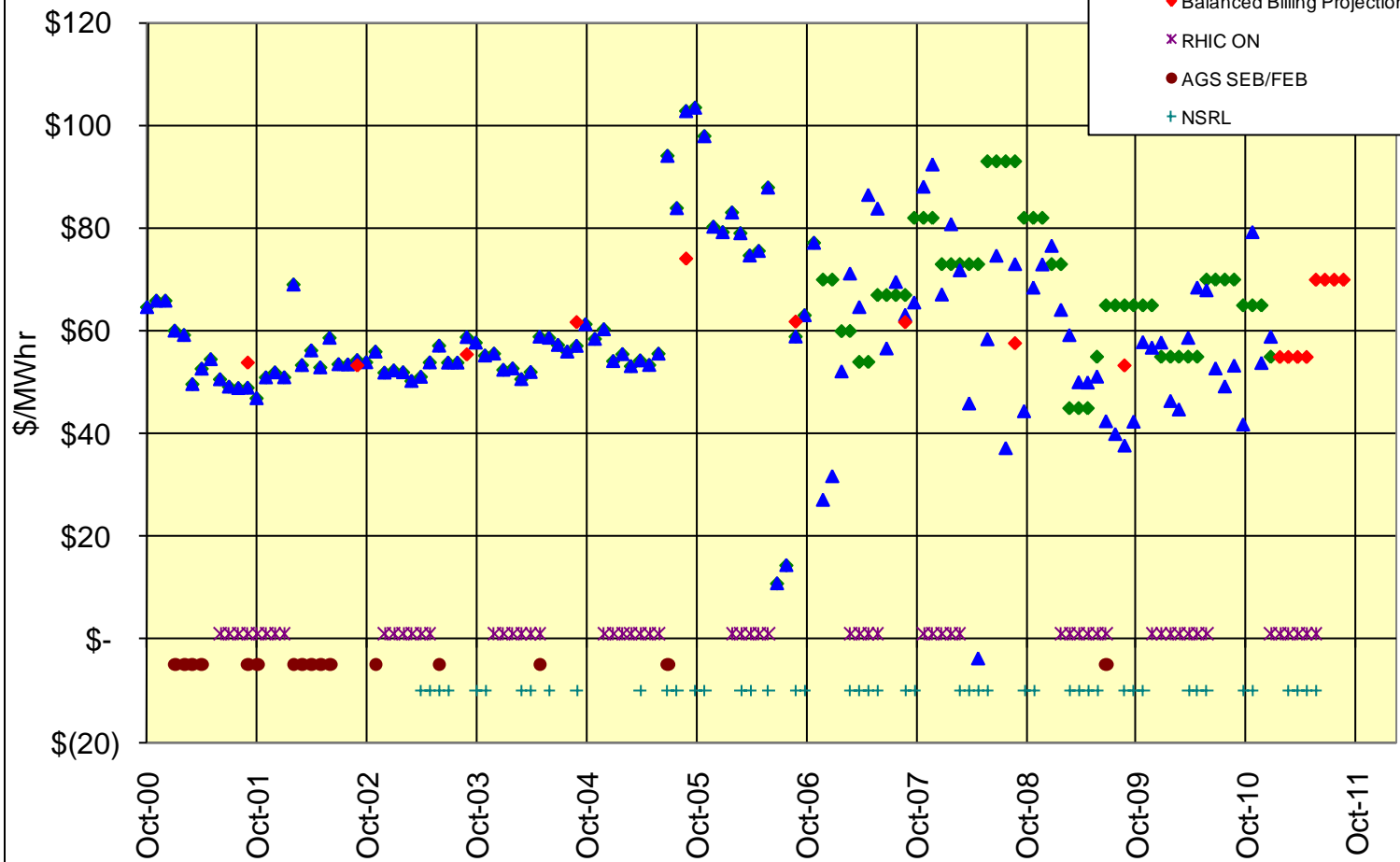
Through 7 Mar 2011

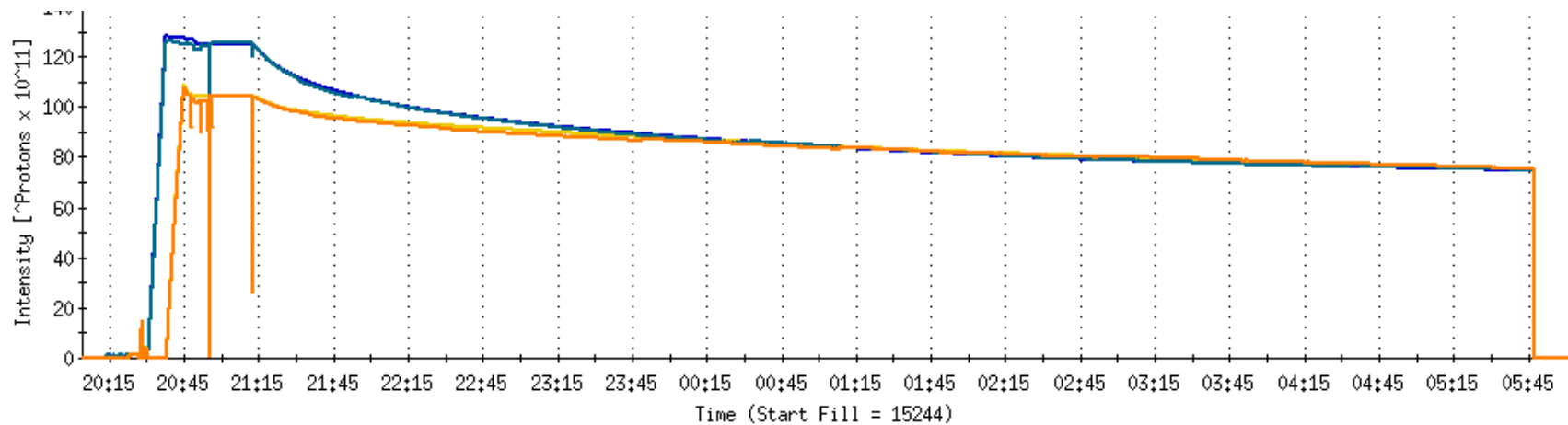
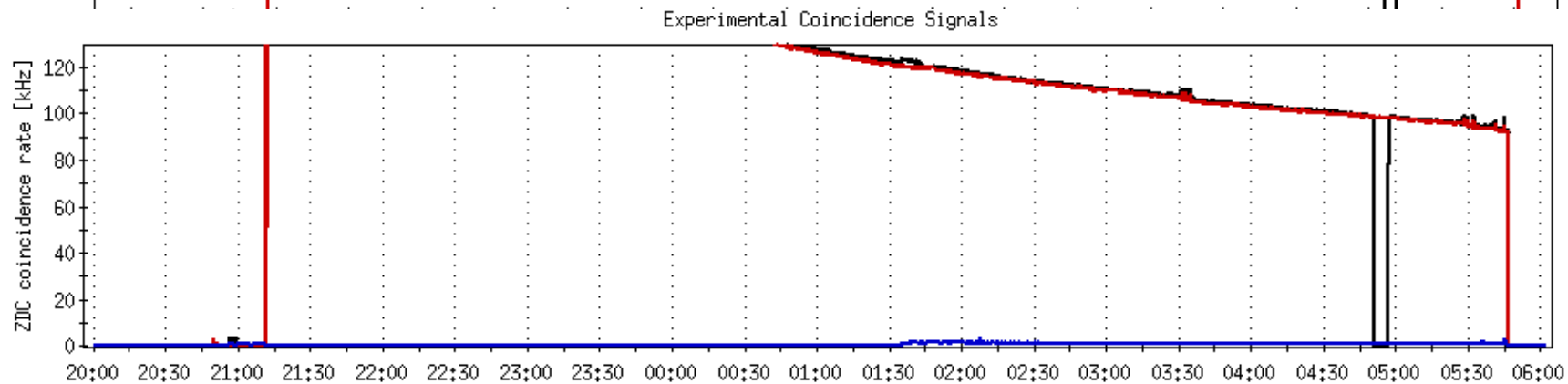
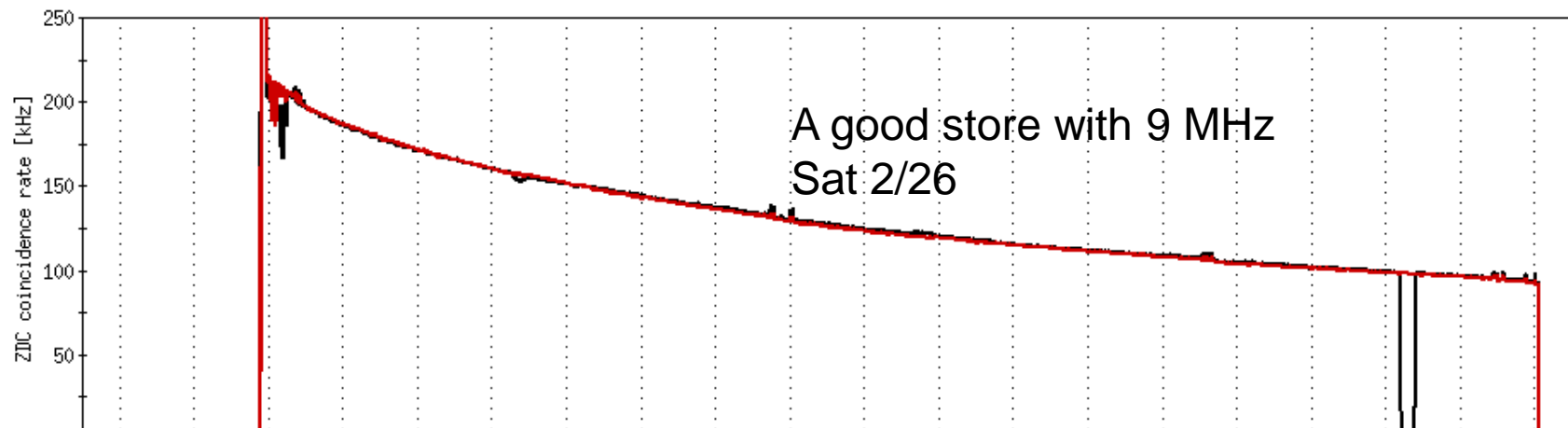


Old information

BNL Energy Cost

through Jan 2011





— bluDCCTtotal

— ye1DCCTtotal

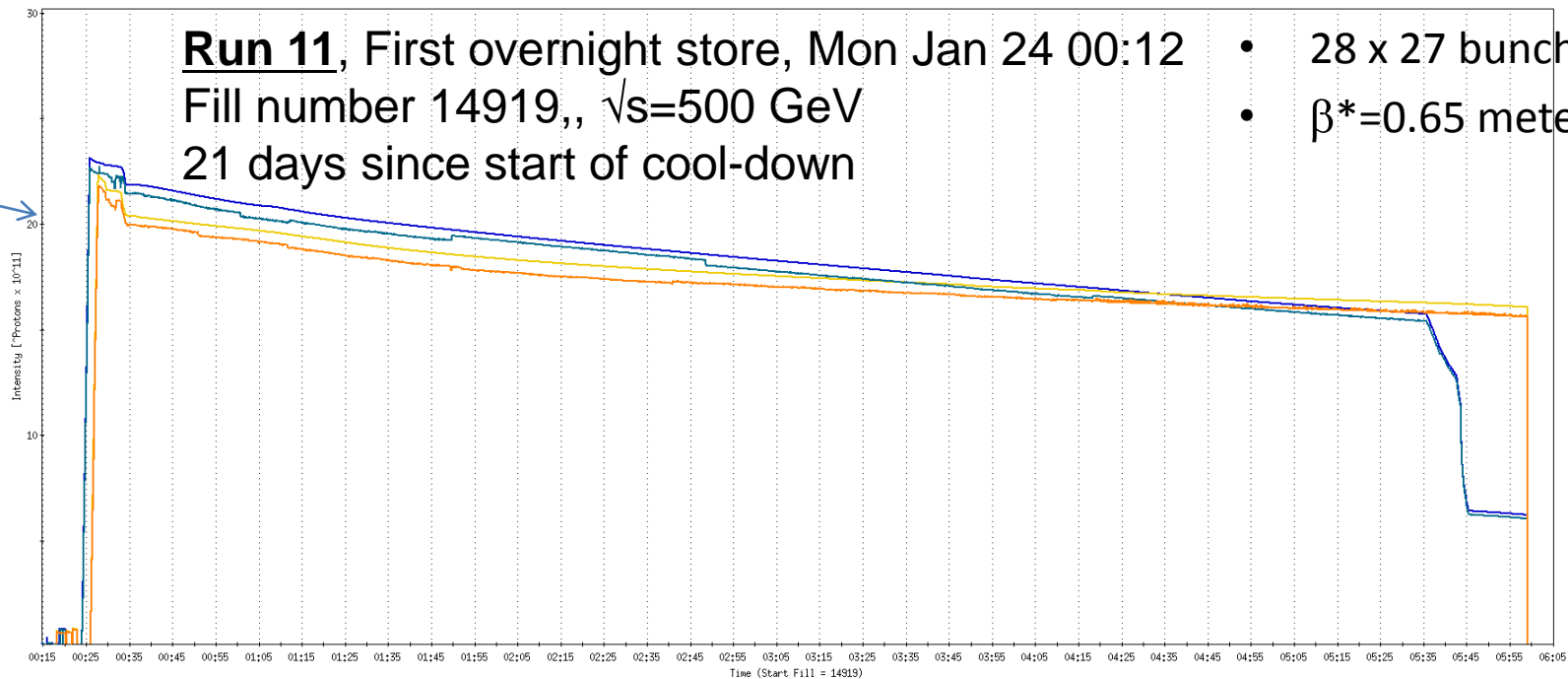
— bluWCBunched

— ye1WCBunched

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

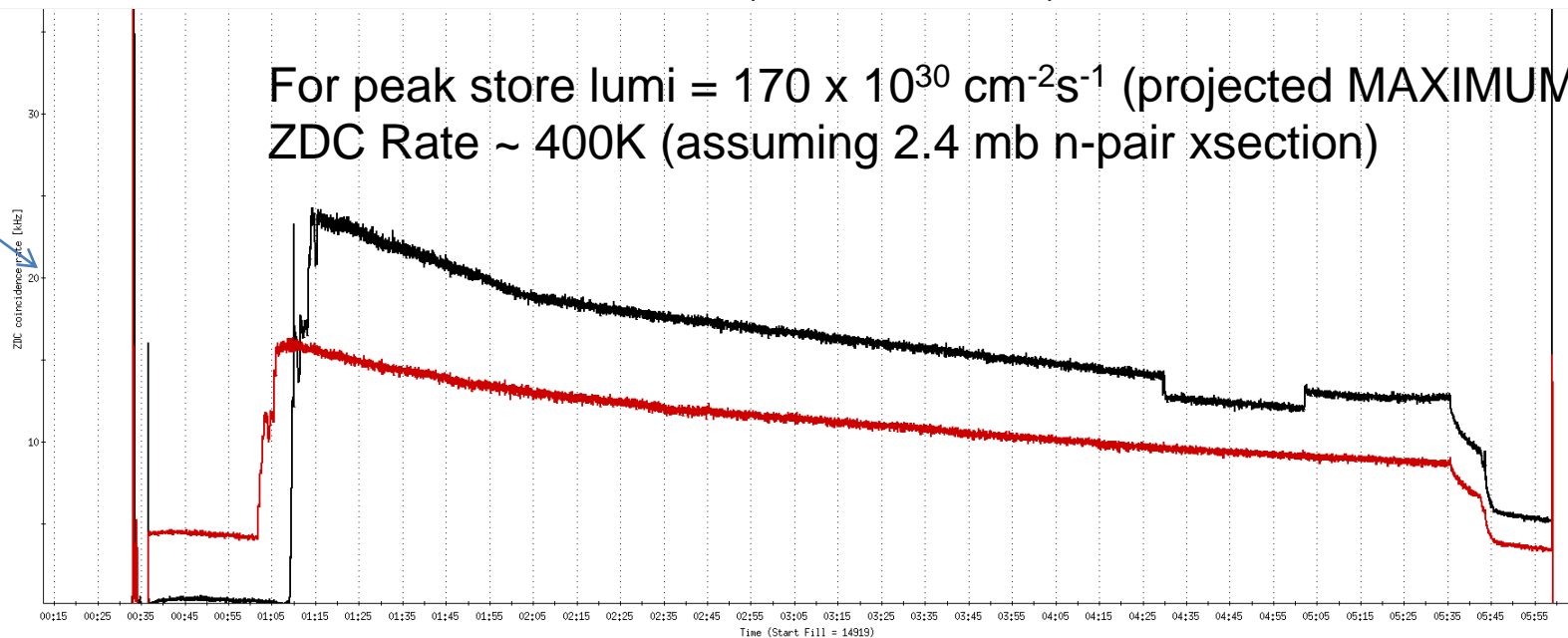
20 x 10¹¹



bluDCCTtotal (C) yelDCCTtotal (C) bluDCBunched yelDCBunched

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)

20K



STAR_ZDC (C) PHENIX_ZDC (C)

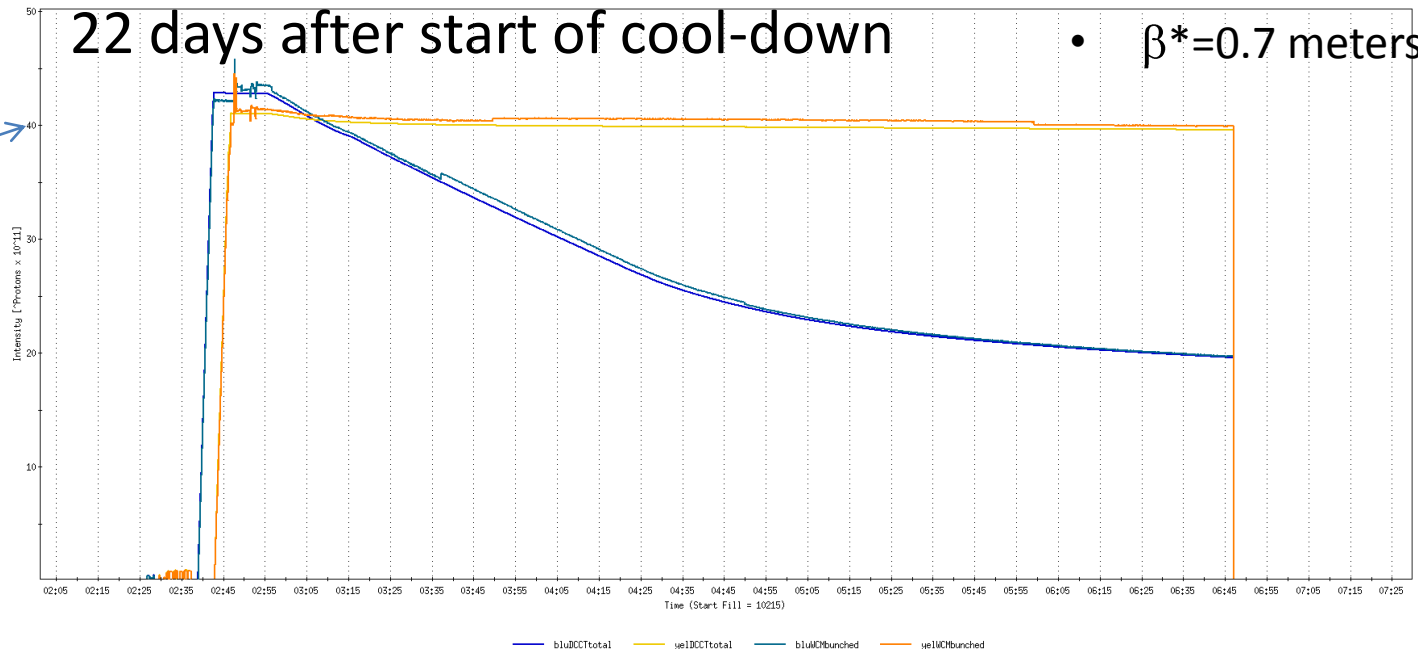
Run 9, First overnight store at $\sqrt{s}=500$ GeV

• 56 x 56 bunches

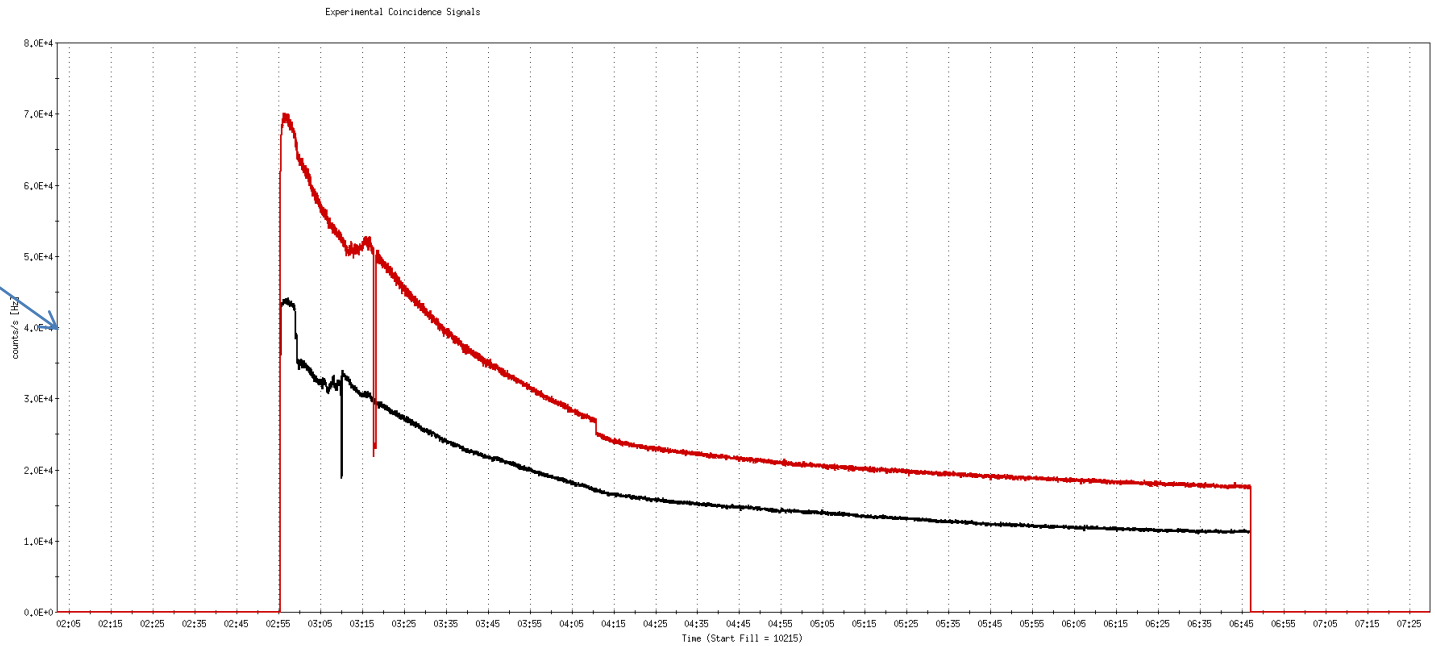
• $\beta^*=0.7$ meters

22 days after start of cool-down

40×10^{11}

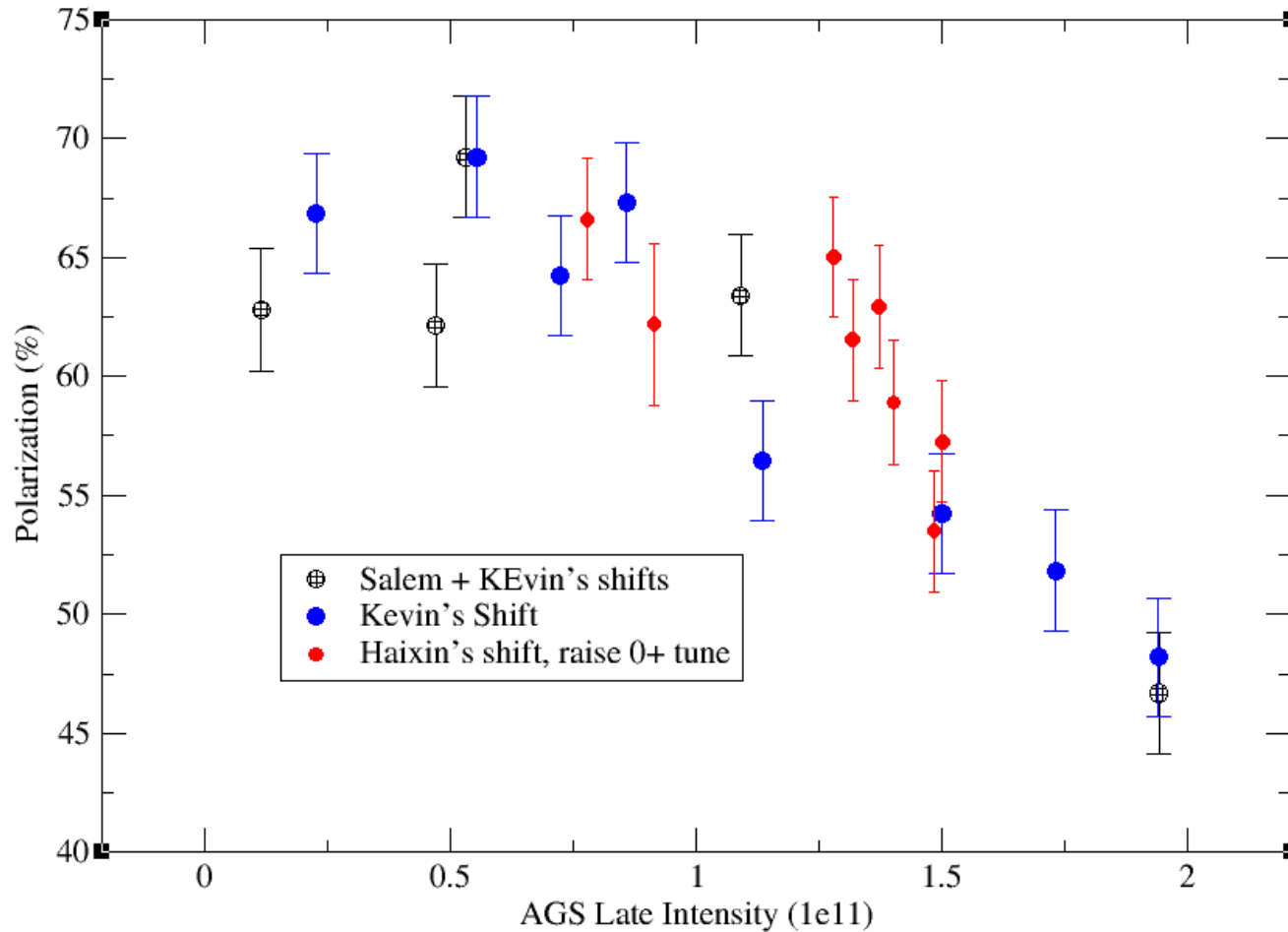


40K



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

AGS pp log, 23 Feb 09, 00:26

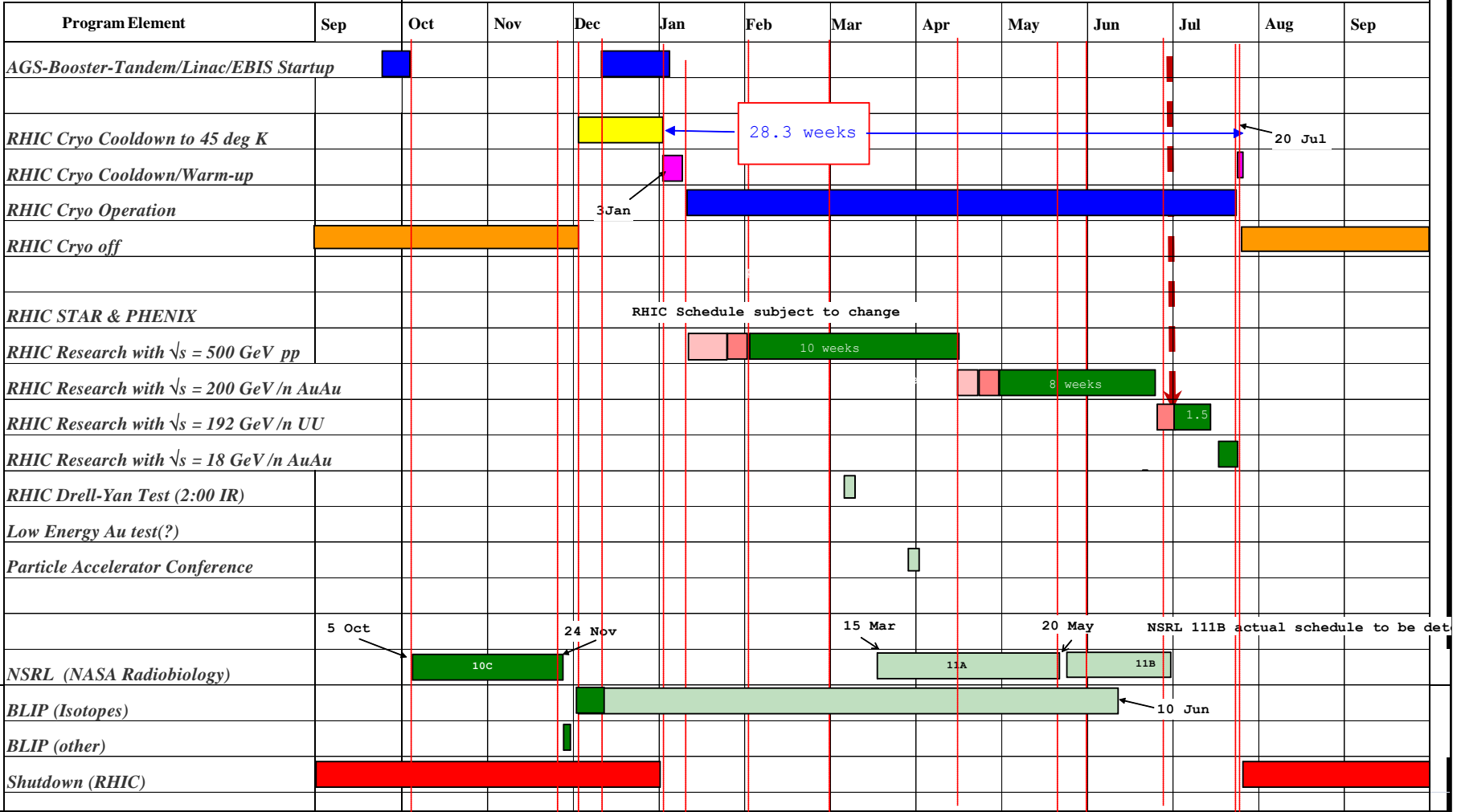


C-A Operations-FY11

planned (budget permitting)

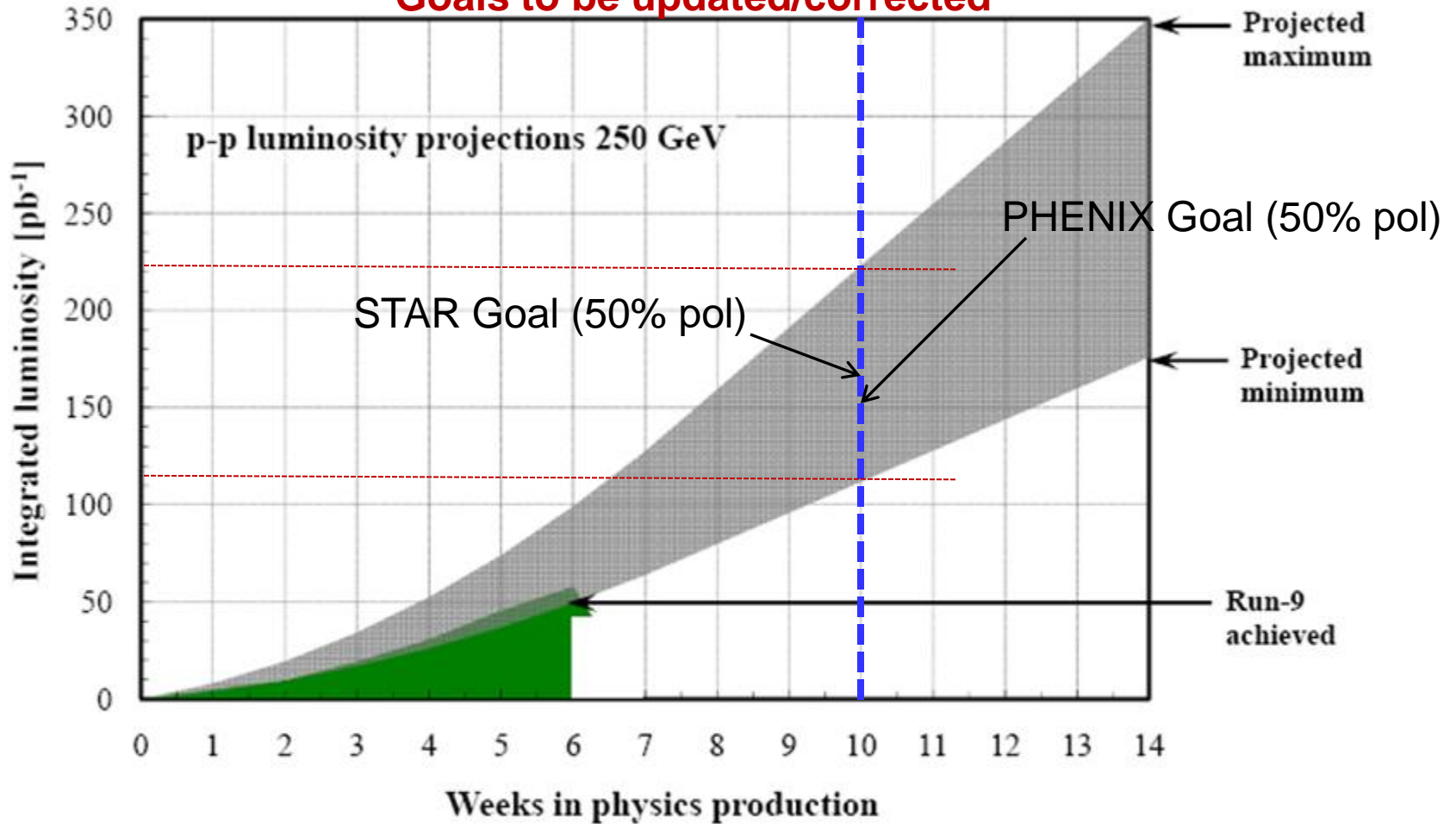
- concurrent with RHIC
- setup with beams
- ramp up luminosity

FY 2011



Run-11 p[↑]-p[↑] luminosity projections

Goals to be updated/corrected

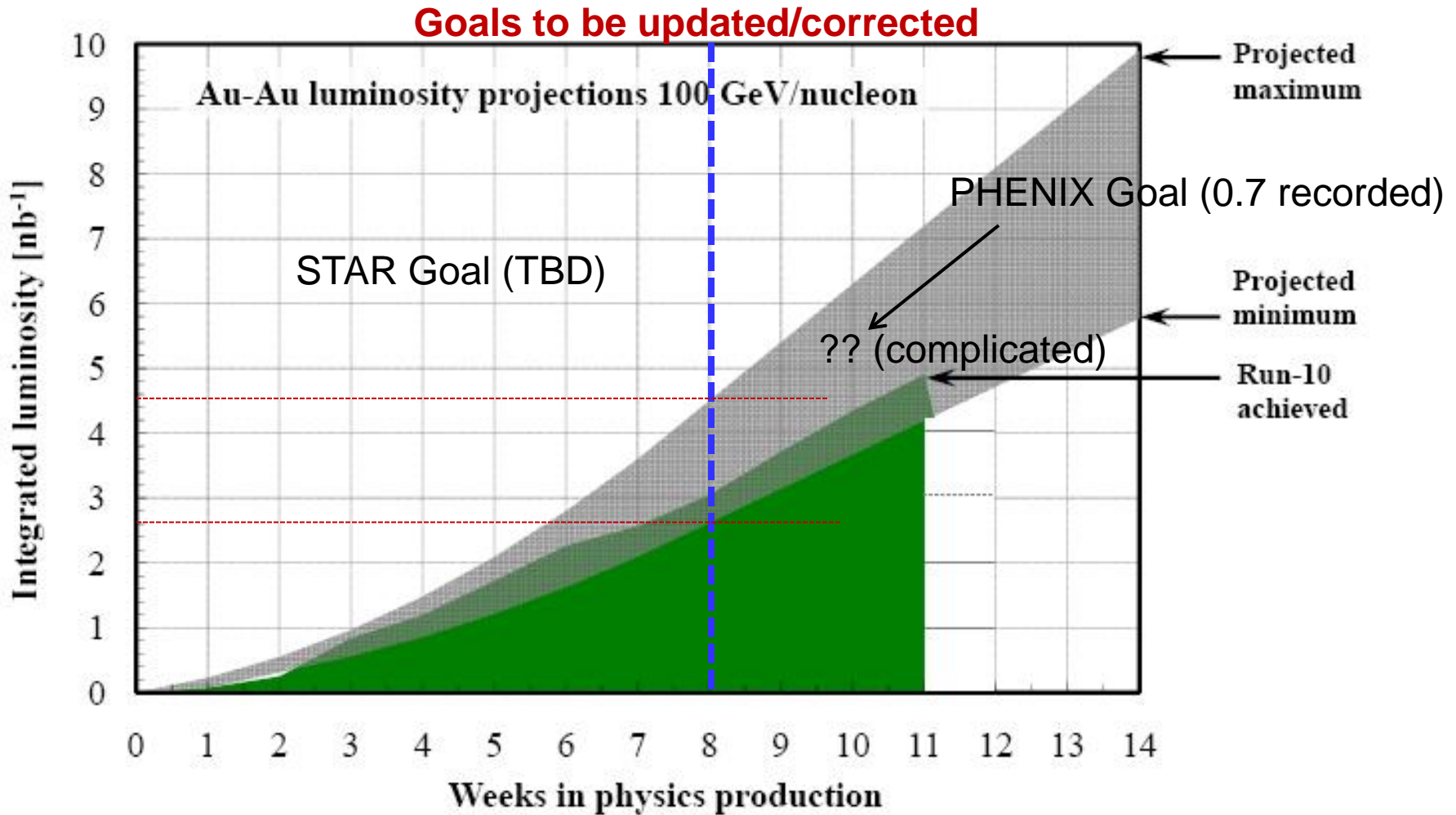


Assume 8 weeks to ramp-up for max.

Expect store $P_{\text{avg}} = 35\text{-}50\%$, L_{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_{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]