

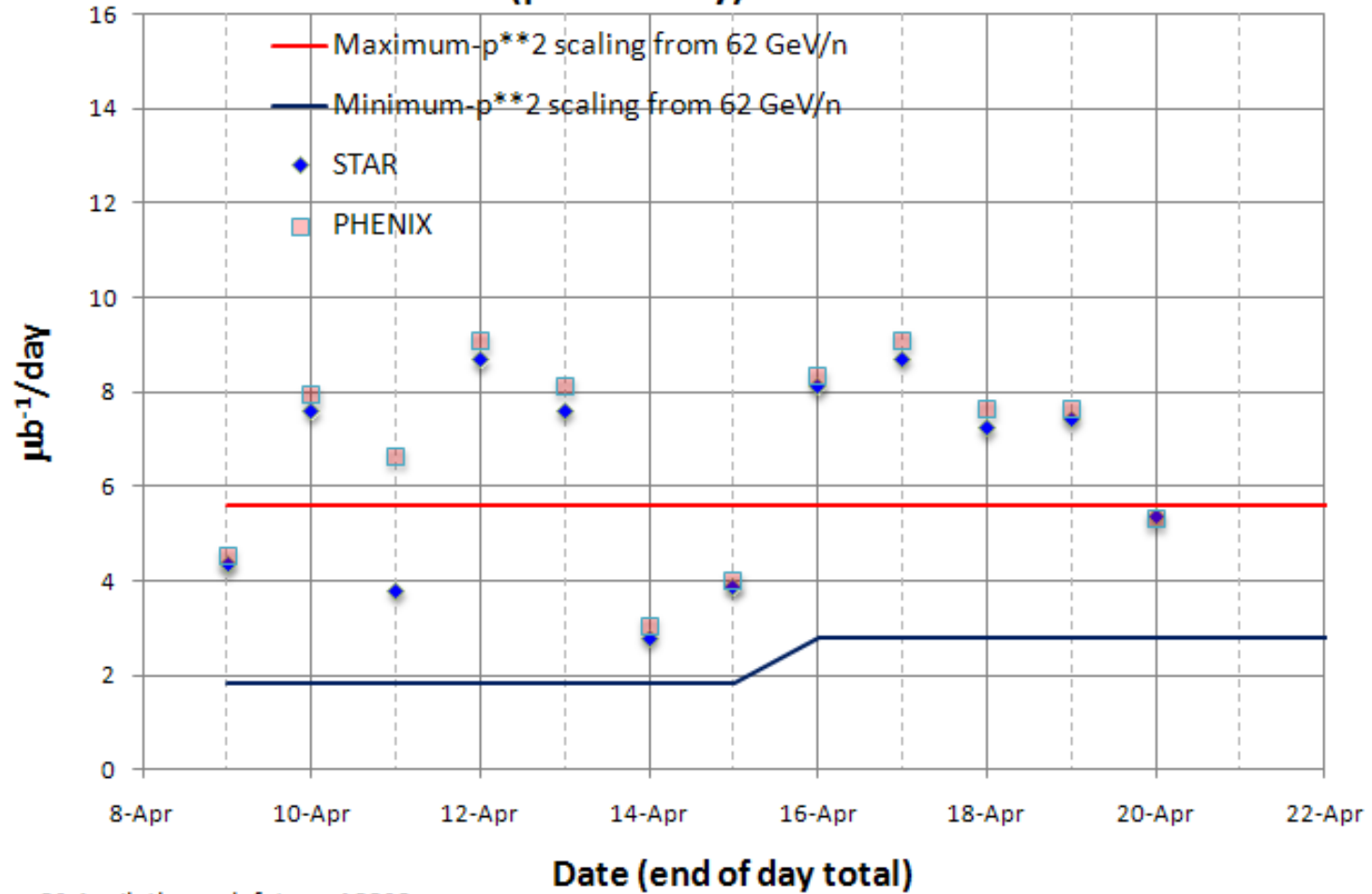
# Run 10 plan based on 25 Nov Revised Plan and $\sqrt{s}=200$ extended by 1 week

- Dec. 1, Begin cool down to 4.5K
- Dec. 4, Cooldown to 4.5K complete in both rings!
- Dec. 5, beam setup in RHIC begins.
- Dec 16, 20 hr unplanned Maintenance day
- Dec 20 (AM)-21(PM), blizzard 09 shut us down
- Dec. 27, RHIC Setup complete, begin Ramp Up for Physics (was 14 Dec, late)
- Dec 31 (midnight-store 11340), Machine, Physics declared (store 11340)  $\sqrt{s}=200$  GeV/n Au-Au
- Jan 2 (midnight) STAR in Physics Mode
- Jan 8 (0600) PHENIX in Physics Mode
- Jan 12, Rebucketing not yet routine, stochastic cooling still to come.
- Jan 22, changed beta\* from 0.6 to 0.7 meters, rebucketing ~established, yellow transverse stochastic cooling on
- Mar. 18 (0556), End 10 week  $\sqrt{s} = 200$  GeV/n Run, begin  $\sqrt{s} = 62.4$  GeV/n setup
- Mar. ~~20~~ **19**, Begin 4 week  $\sqrt{s} = 62.4$  GeV/n run
  - **Machine physics 19 March for stores  $\geq 11954$**
  - **PHENIX Physics 19 Mar for stores  $\geq 11955$**
  - **STAR Physics 22 March for stores  $\geq 11976$**
- Apr. 8, End 2.9 week  $\sqrt{s} = 62.4$  GeV/n Run, begin  $\sqrt{s} = 39$  GeV/n setup
- Apr. 9, Begin 1.5 week  $\sqrt{s} = 39$  GeV/n run
  - Machine physics 9 April for stores  $\geq 12119$
  - PHENIX and STAR Physics 9 April for stores  $\geq 12122$
- Apr. 14, 24 hours APEX for n= 0.67 studies
- Apr. 22, End 1.9 week  $\sqrt{s} = 39$  GeV/n Run
- Apr 22, Begin  $\sqrt{s} = 7.7$  GeV/n setup (12 hr pol. switches)
- Apr 24, Begin 4 week  $\sqrt{s} = 7.7$  GeV/n run
  
- May 22 End 4 week  $\sqrt{s} = 7.7$  GeV/n Run, begin  $\sqrt{s} = 11.5$  GeV/n setup **(4-6 hr polarity switch, if necessary)**
- **May 23 – 28 IPAC (Kyoto)**
- **May 22 – Jun 3, Satogata is away**
- May 24, begin  $\sqrt{s} = 11.5$  GeV/n for STAR
- Jun 7, end 2 week  $\sqrt{s} = 11.5$  GeV/n run, begin  $\sqrt{s} = 5$  GeV/n setup **(4-6 hr polarity switch, if necessary)**
- Jun 9, begin  $\sqrt{s} = 5$  GeV development
- Jun 12, end 3 days at  $\sqrt{s} = 5$  GeV/n
- Jun 13, Begin Cryo Warm-up
- Jun 14, Warm-up complete, Run 10 ends – **27.9 CRYO WEEKS**
- **Last Week of June – Commission EBIS with He beam to NSRL**

## Run 10 plan based on 25 Nov Revised Plan and $\sqrt{s}=200$ extended by 1 week

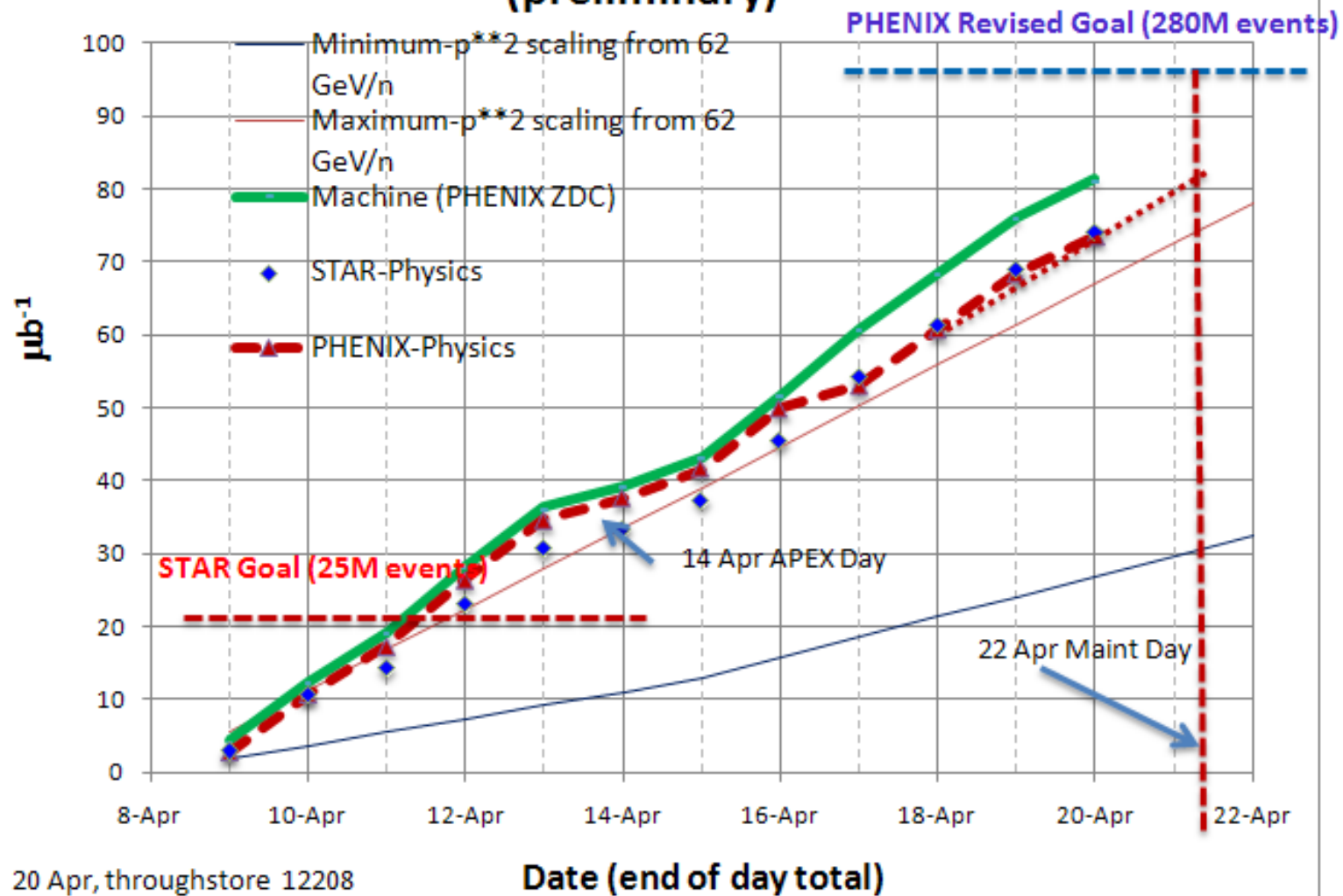
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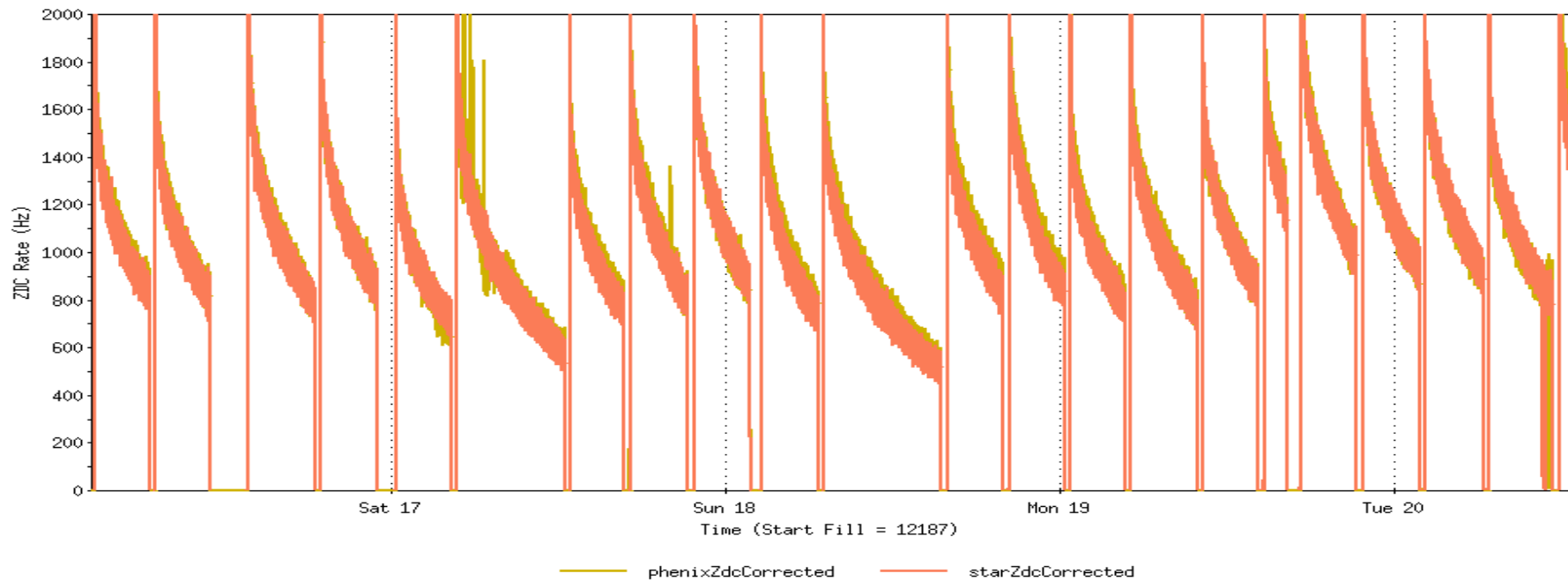
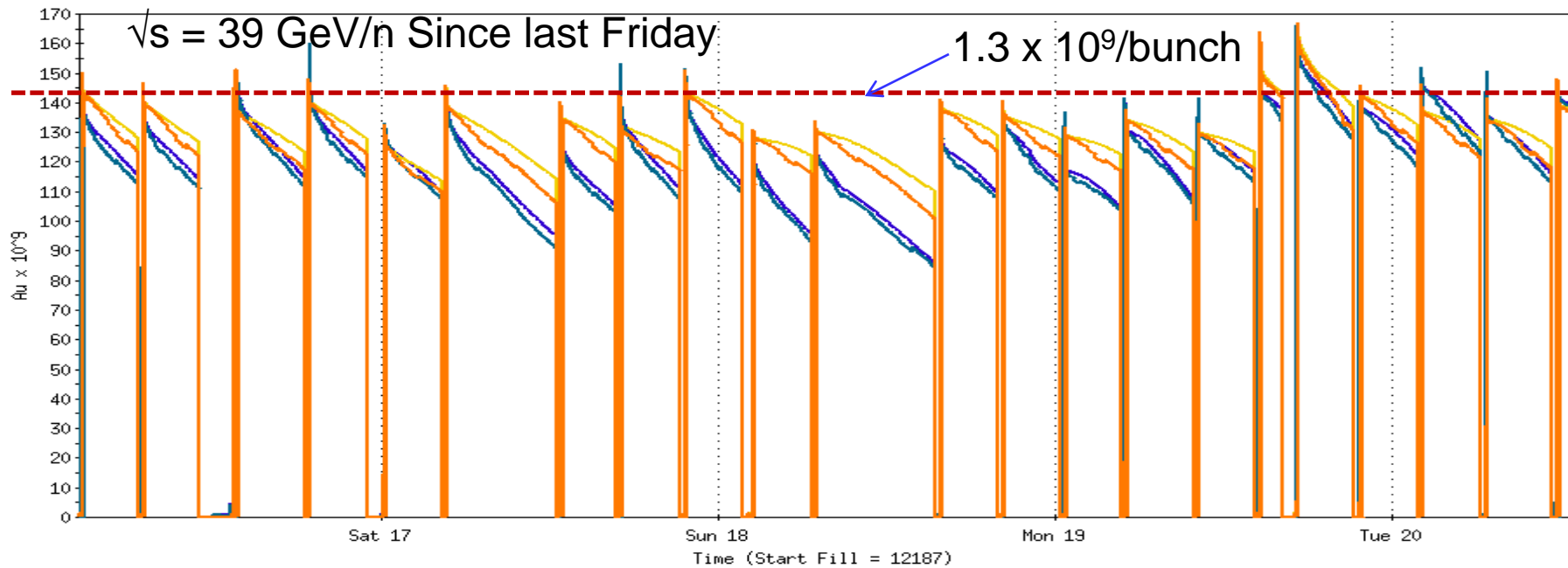
# Run 10, $\sqrt{s} = 39$ GeV/n Au Delivered Luminosity per day (preliminary)

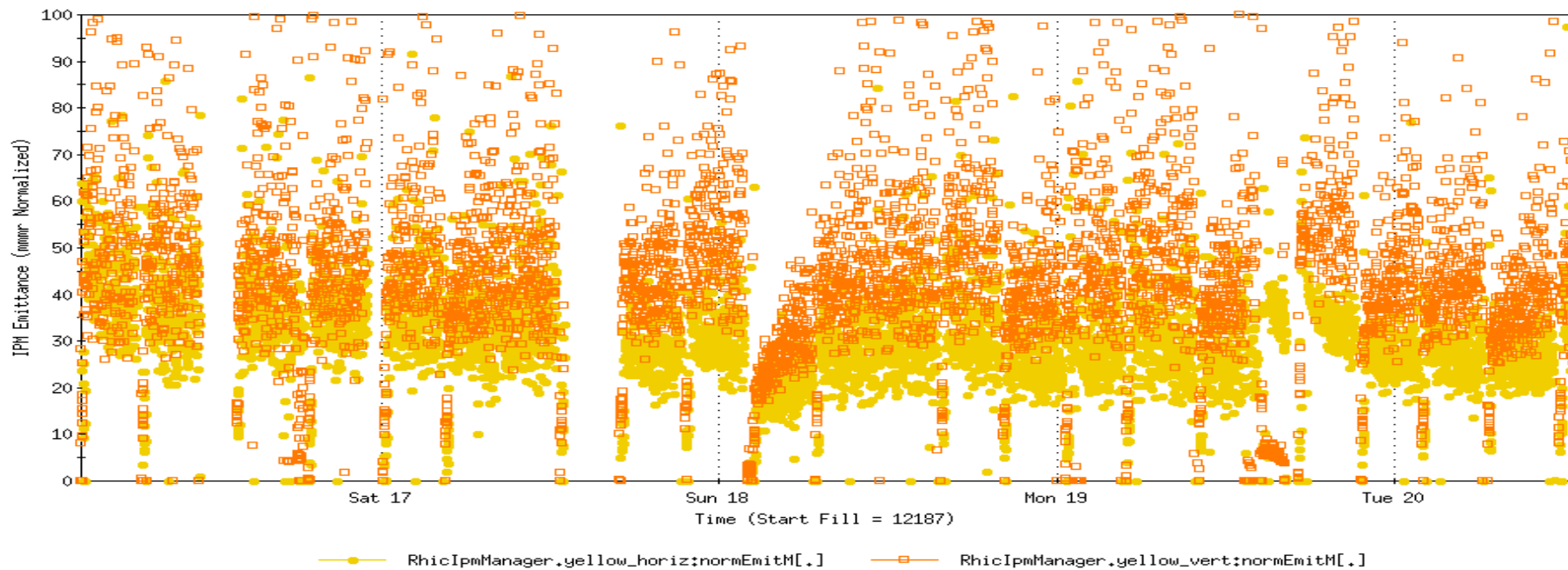
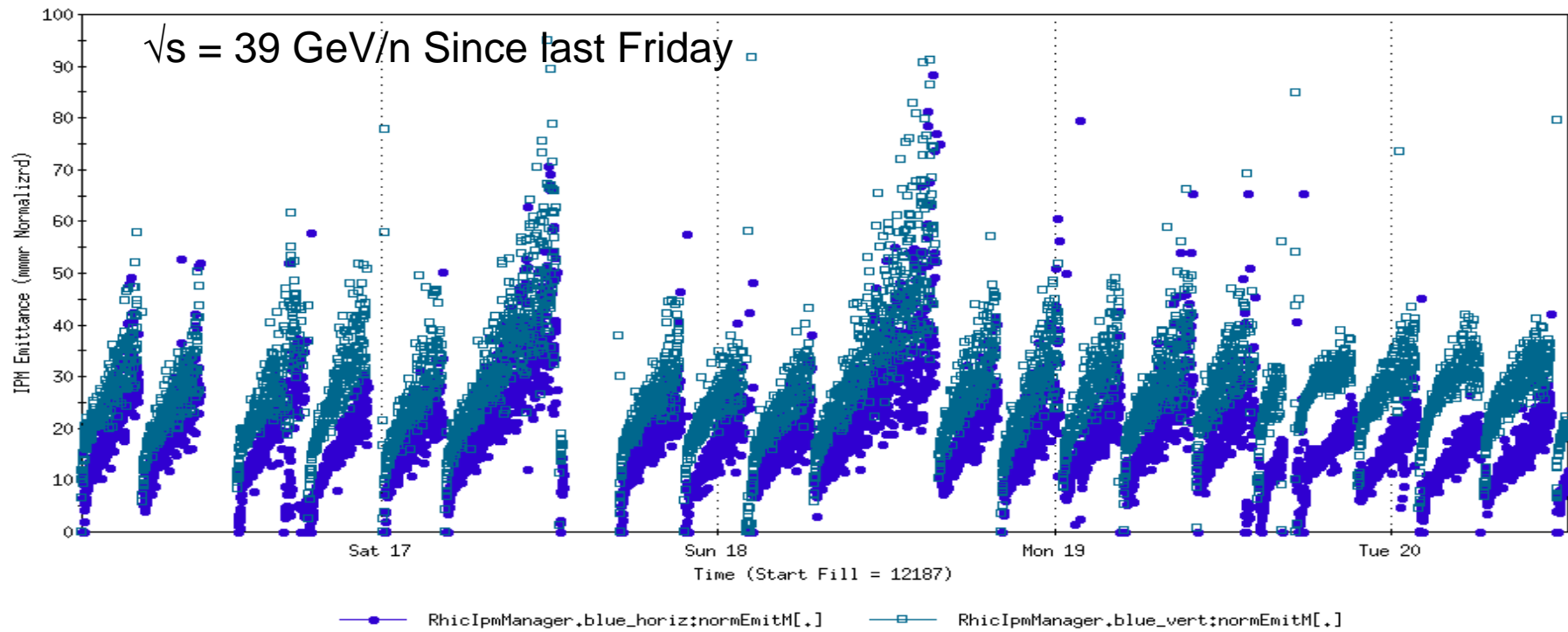


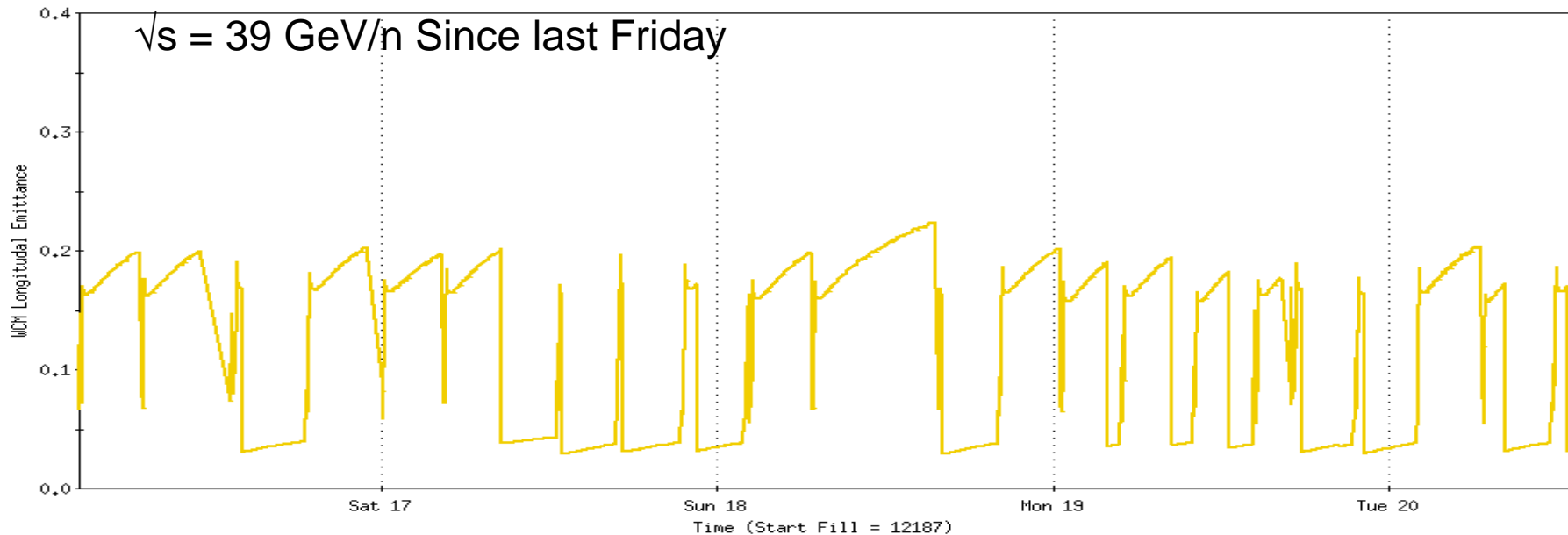
20 April, through fstore 12208

# Run 10 $\sqrt{s} = 39$ GeV/n Au Delivered Luminosity (preliminary)

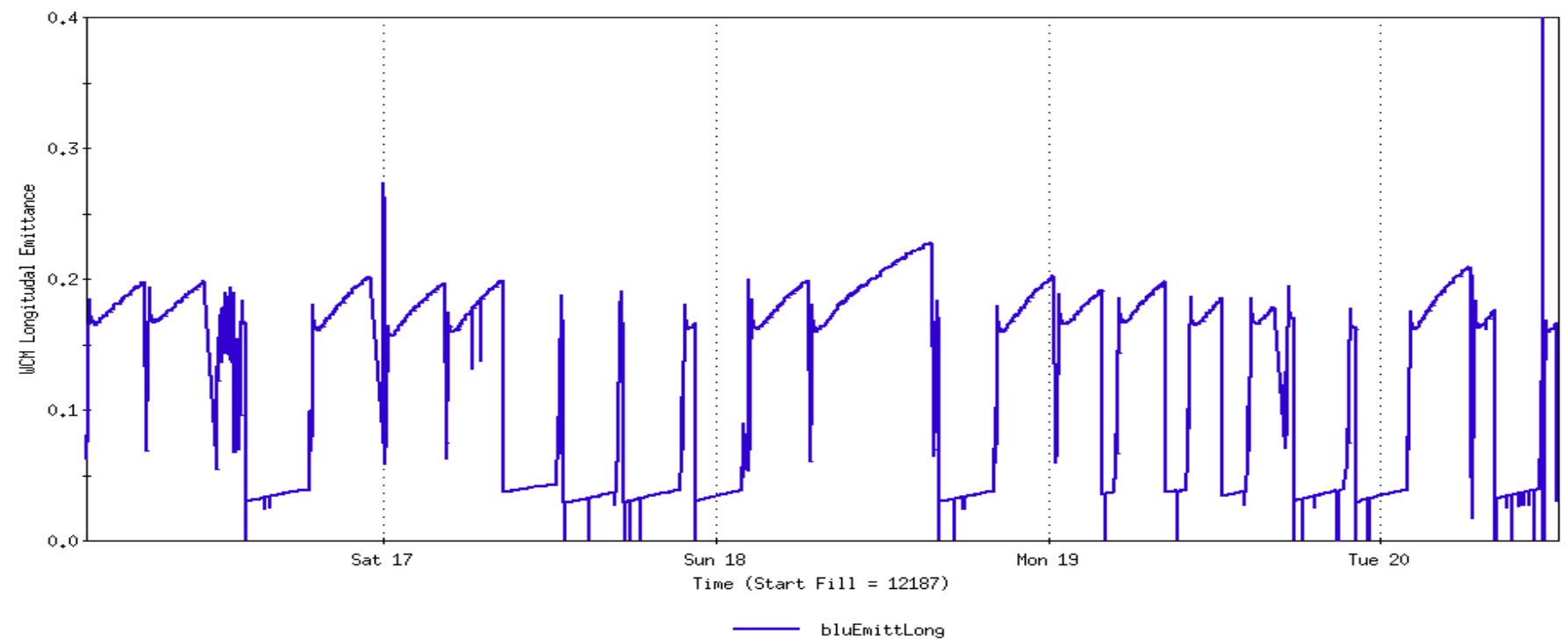




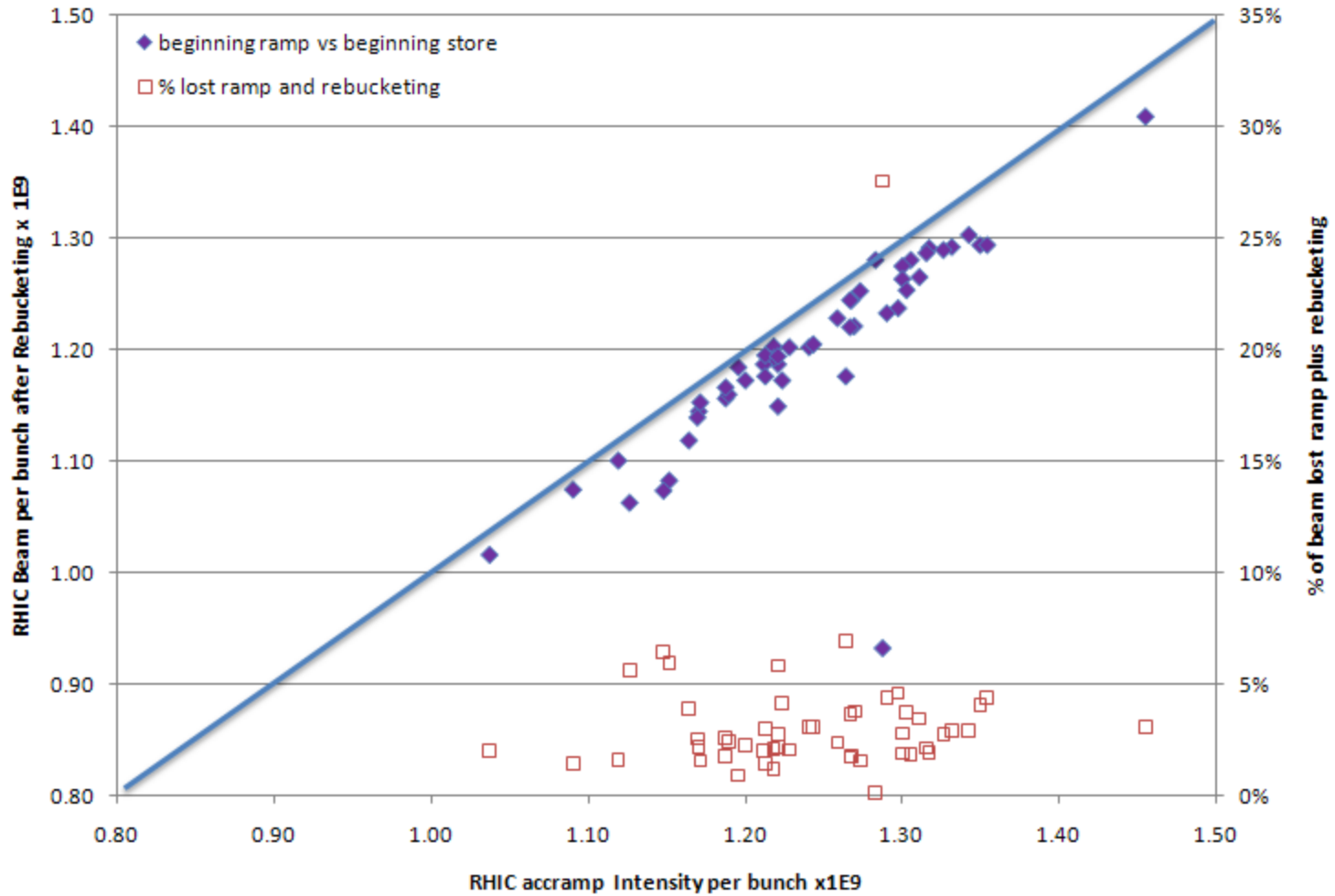




Long Emitt from WCM

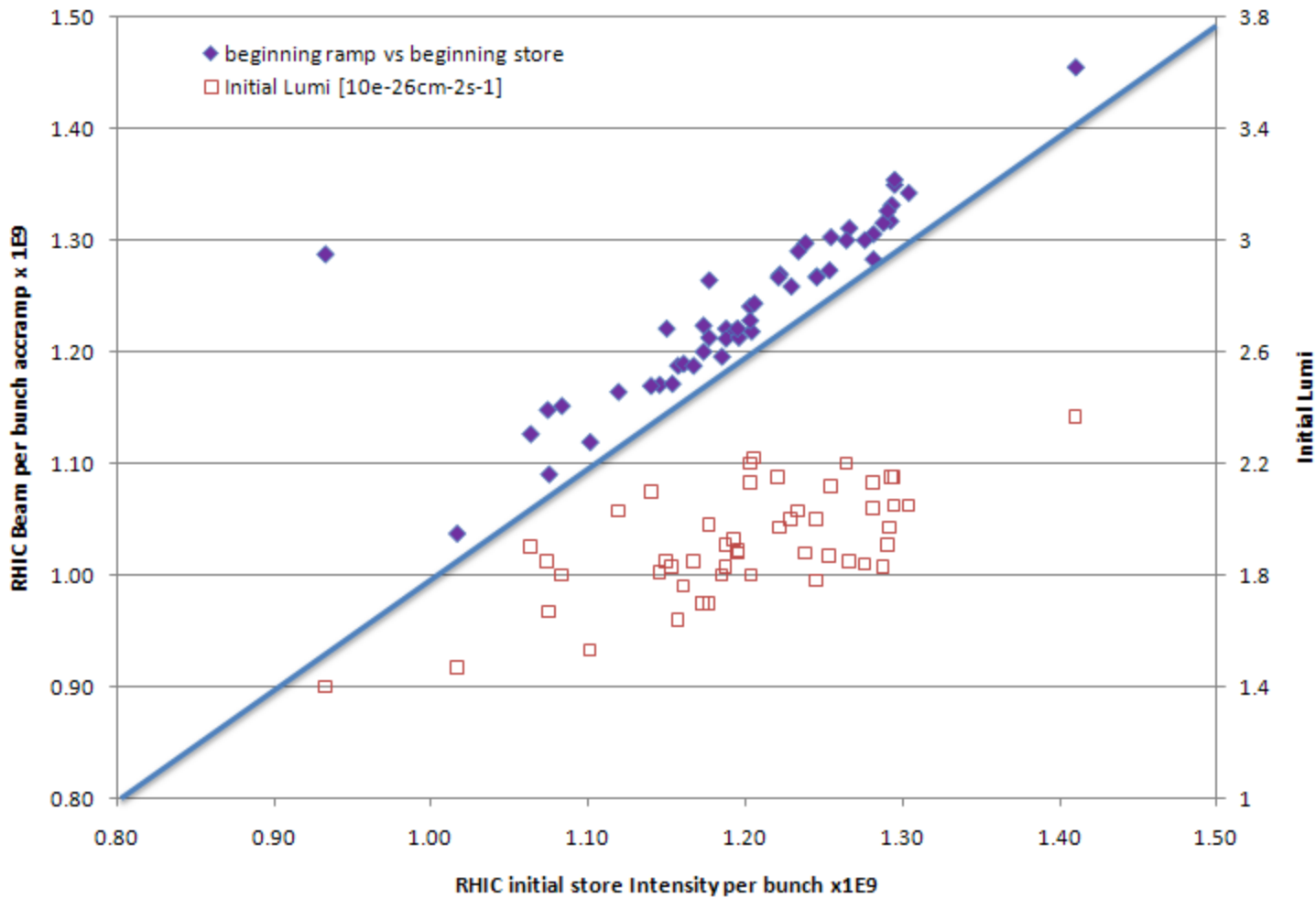


# Run 10, 39 GeV AuAu

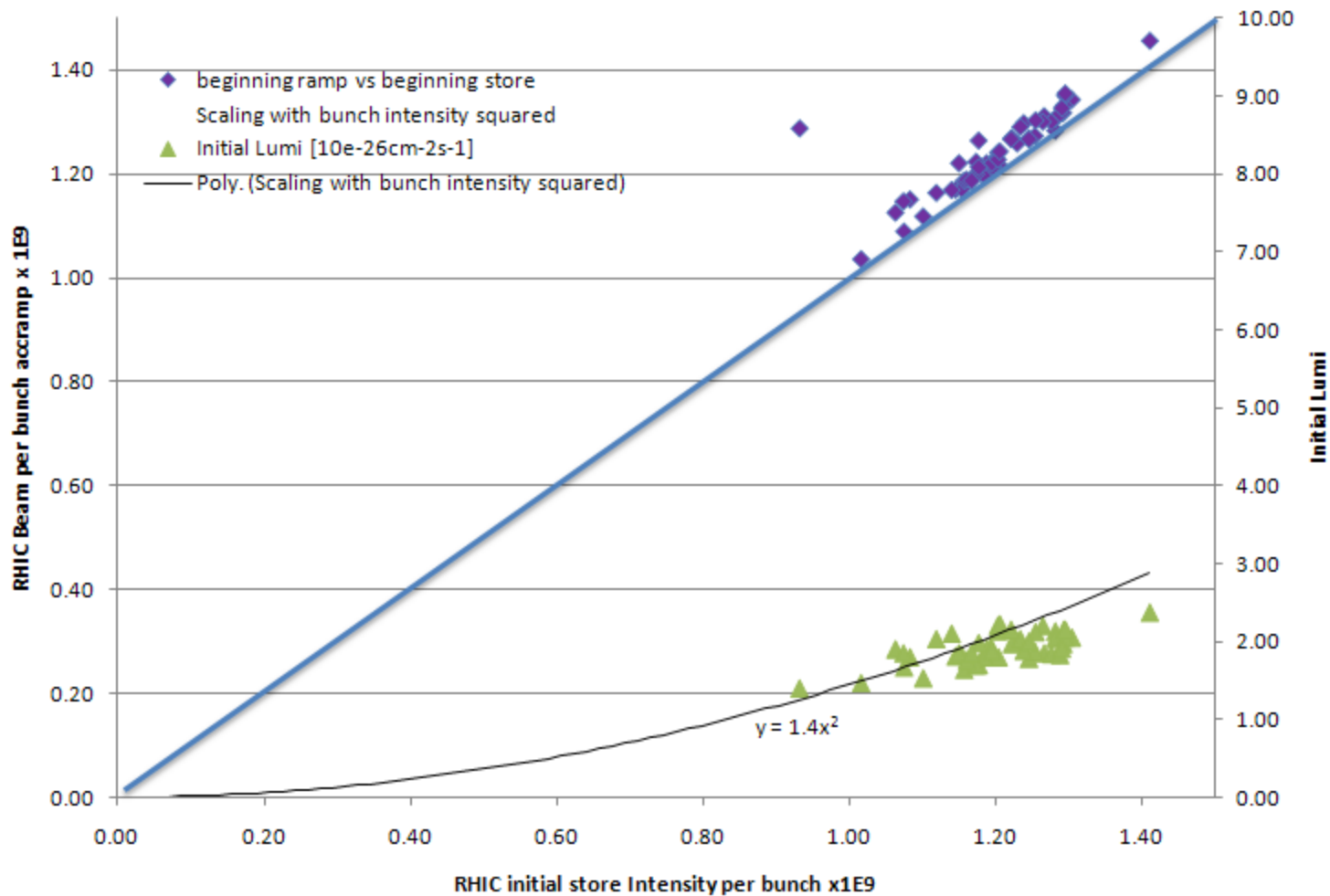




# Run 10, 39 GeV AuAu



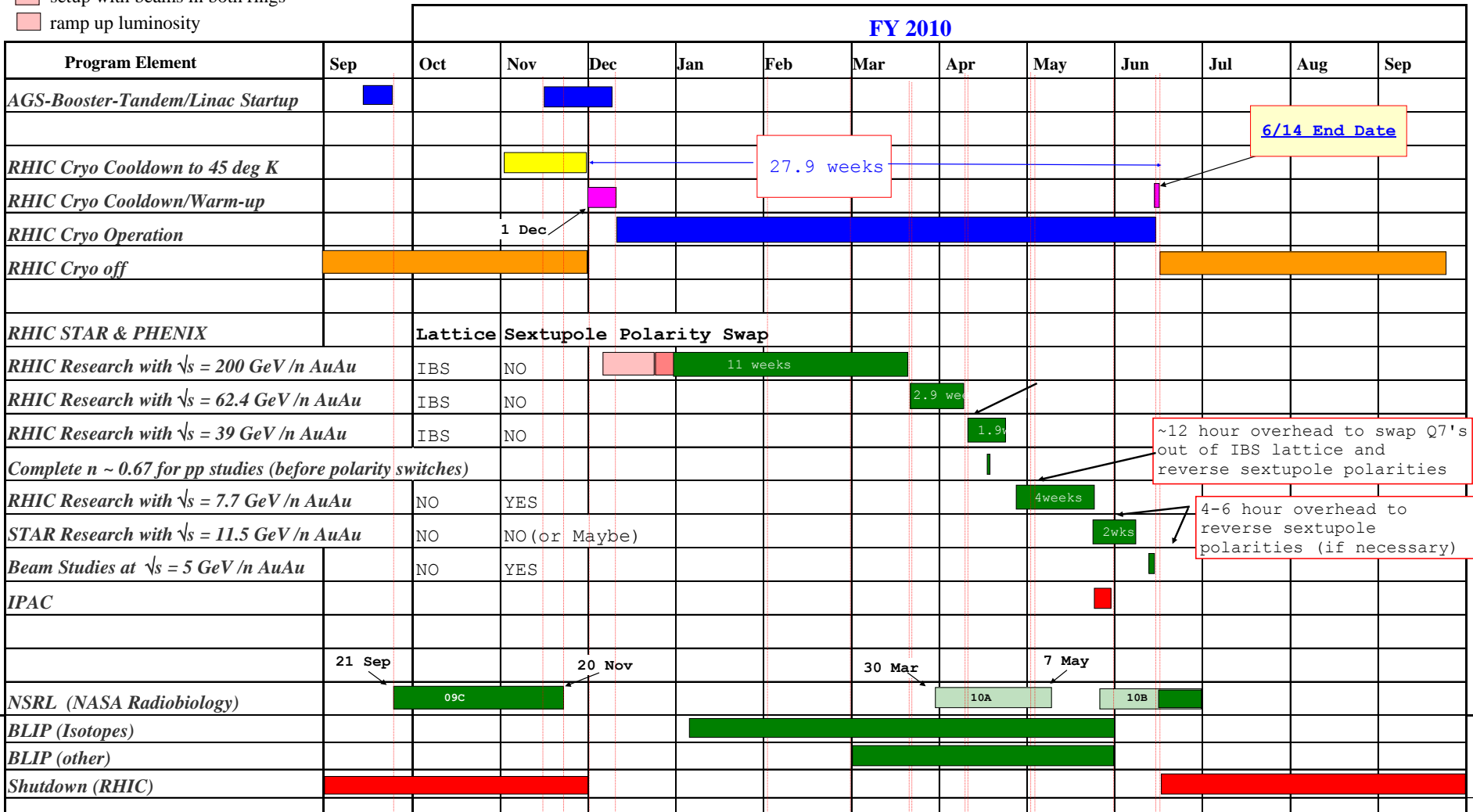
# Run 10, 39 GeV AuAu



# C-A Operations-FY10

*as run/planned*

- concurrent with RHIC
- setup with beams in both rings
- ramp up luminosity



6/14 End Date

27.9 weeks

~12 hour overhead to swap Q7's out of IBS lattice and reverse sextupole polarities

4-6 hour overhead to reverse sextupole polarities (if necessary)

Archive

# Run 10 Au-Au Goals, $\sqrt{s} = 39 \text{ GeV/n}$

4/13/10

- STAR

- $\sqrt{s} = 39 \text{ GeV/n}$

- Luminosity Sampled/Delivered = ?/?  $\mu\text{b}^{-1}$

- 24M Min-bias events

- PHENIX

- $\sqrt{s} = 39 \text{ GeV/n}$

- Luminosity Recorded/Delivered = ?/?  $\mu\text{b}^{-1}$

- 50M Min-bias events <30 cm vertex, (revised request 280M)

**We should revisit Luminosity Projections**

Table 6: Detailed plan for Run-10. PHENIX BUR

	$\sqrt{s_{NN}}$	weeks	events	comment
cooldown		2		
Au+Au start/rampup	200	3		
Au+Au physics	200	10		record 1.4nb <sup>-1</sup>
	62.4	3.5	350M	<i>(Actual 2.5 weeks, 660M)</i>
	≈ 39	1.6	50M	
	27	4.5	25M	
p+p development	500	4		PHENIX ops as needed
p+p physics	22.4	1	2.5B	
warm-up		0.5		
<b>TOTAL</b>		<b>30</b>		

Table II: Detailed breakdown of Critical Point search and Beam Energy Scan

**STAR BUR**

Beam Energy	Event Rate	8-hr Days/ 1M Events	Events proposed	8-hr days proposed
5	0.8	45	100 k	5
7.7	3	11	5 M	56
11.5	10	3.7	5M	19
17.3	33	1.1	15M	16
27	92	0.4	33M	12
39	<b>190</b>	0.2	24M	5

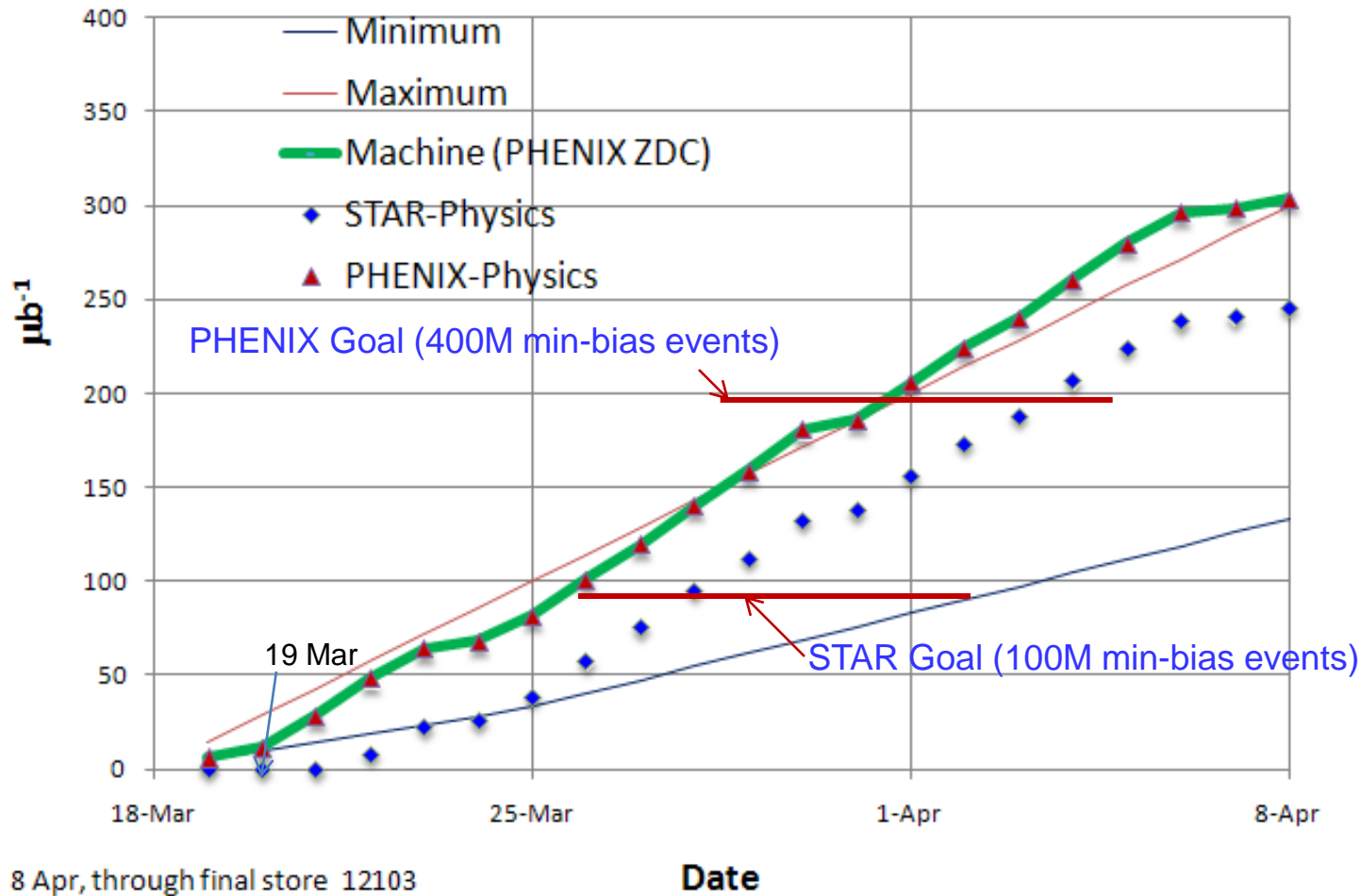
**Actual Average ZDC Rate ~1200 Hz** →



# Future Topics

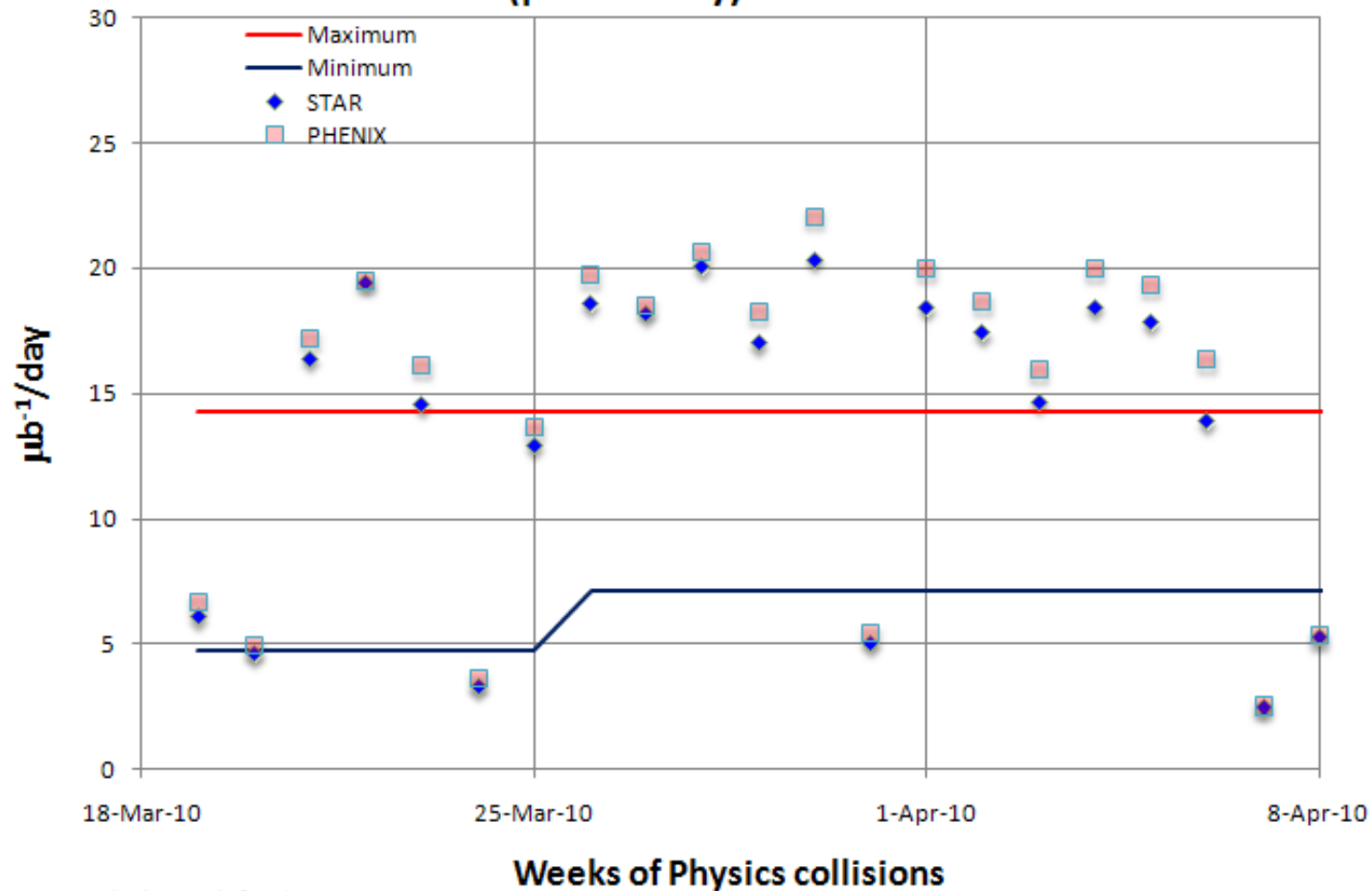
- Toward Smaller  $\beta^*$  - new quad triplets – D. Trbojevic

# Run 10 31 x 31 GeV/n Au Delivered Luminosity (preliminary)





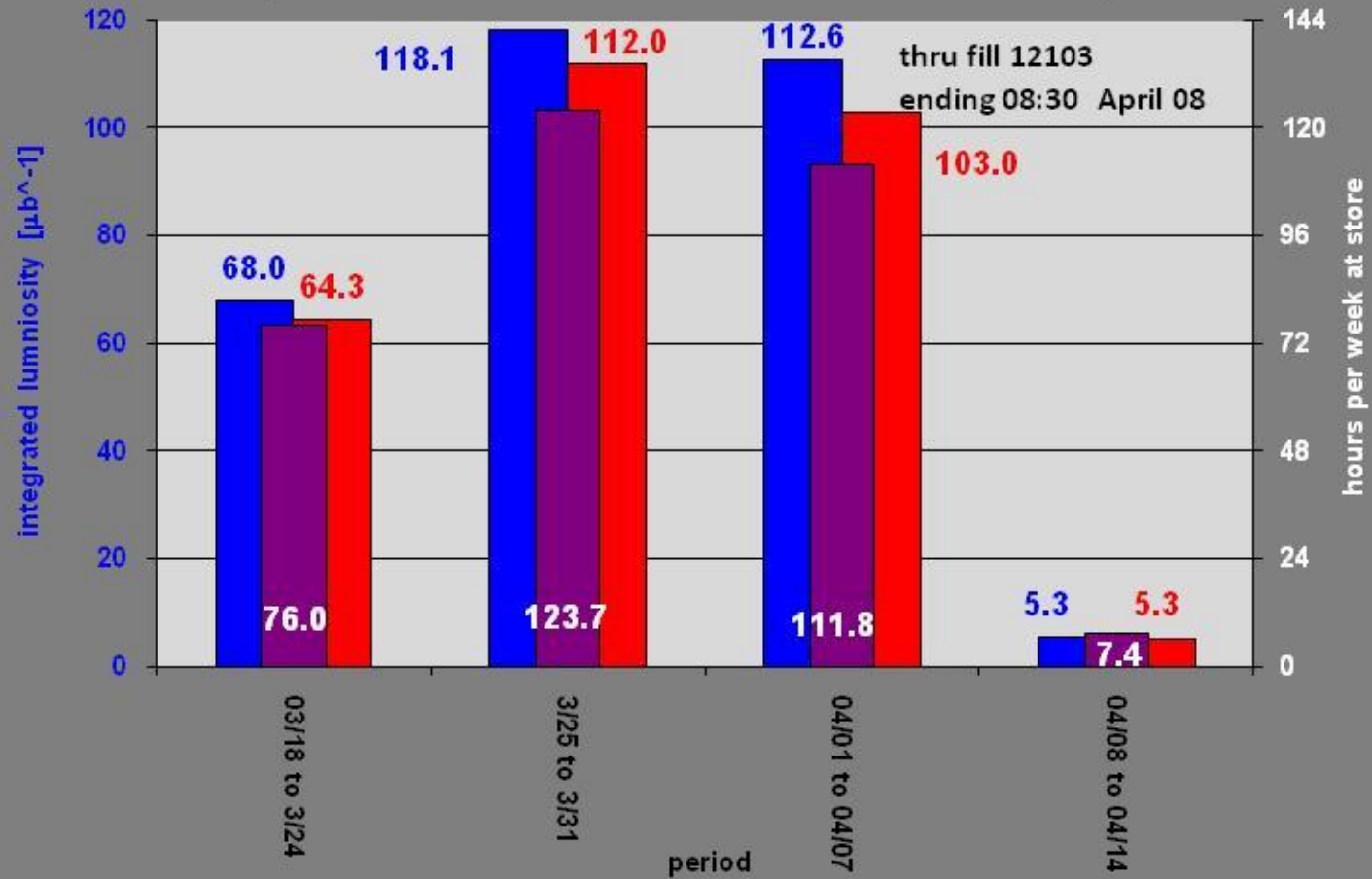
## Run 10, 31 x 31 GeV/n Au Delivered Luminosity per day (preliminary)



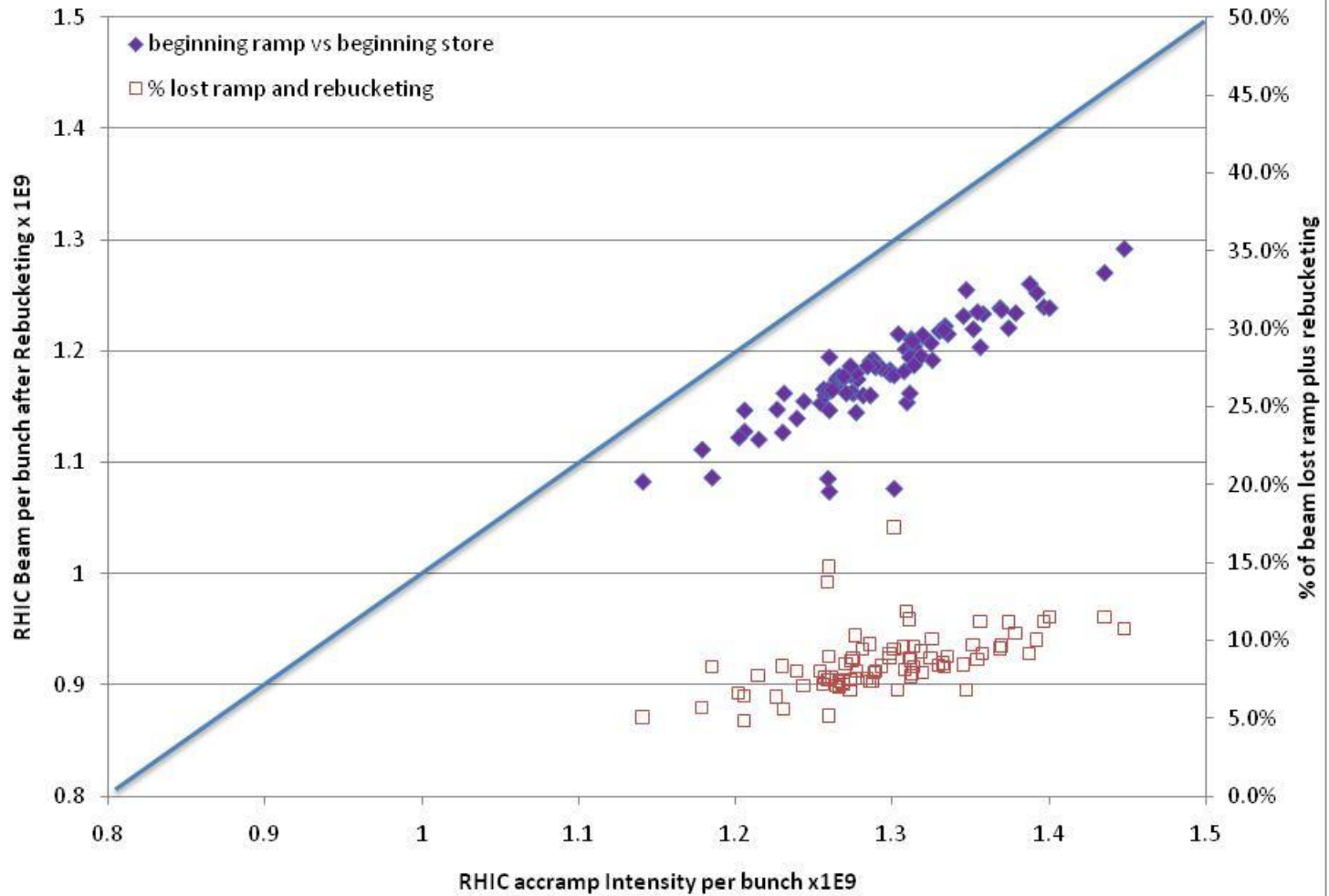
8 April, through final store 12103

### Run 10 (AuAu) -- Integrated Luminosity by week

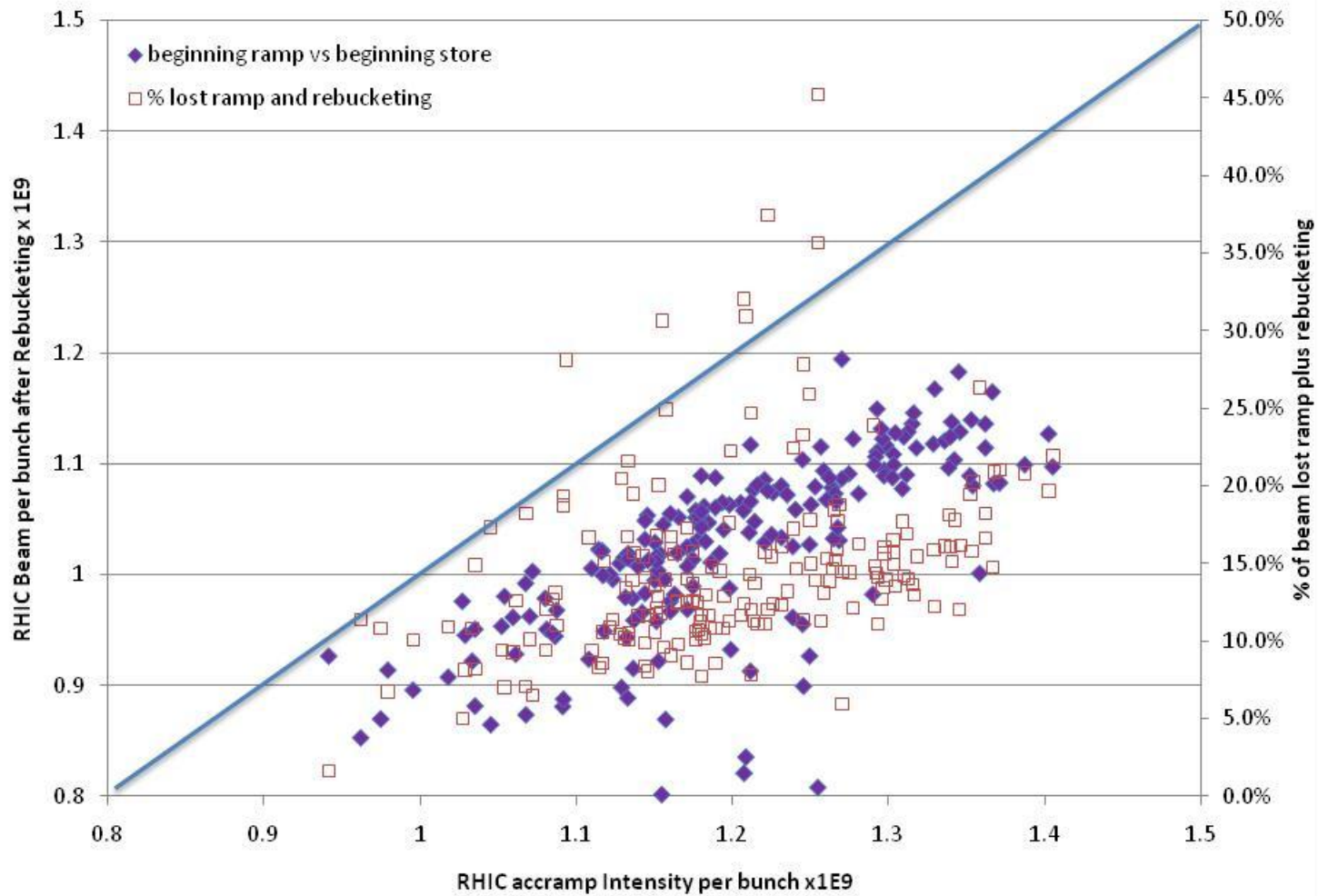
$\sqrt{s} = 62 \text{ GeV/n}$   
final



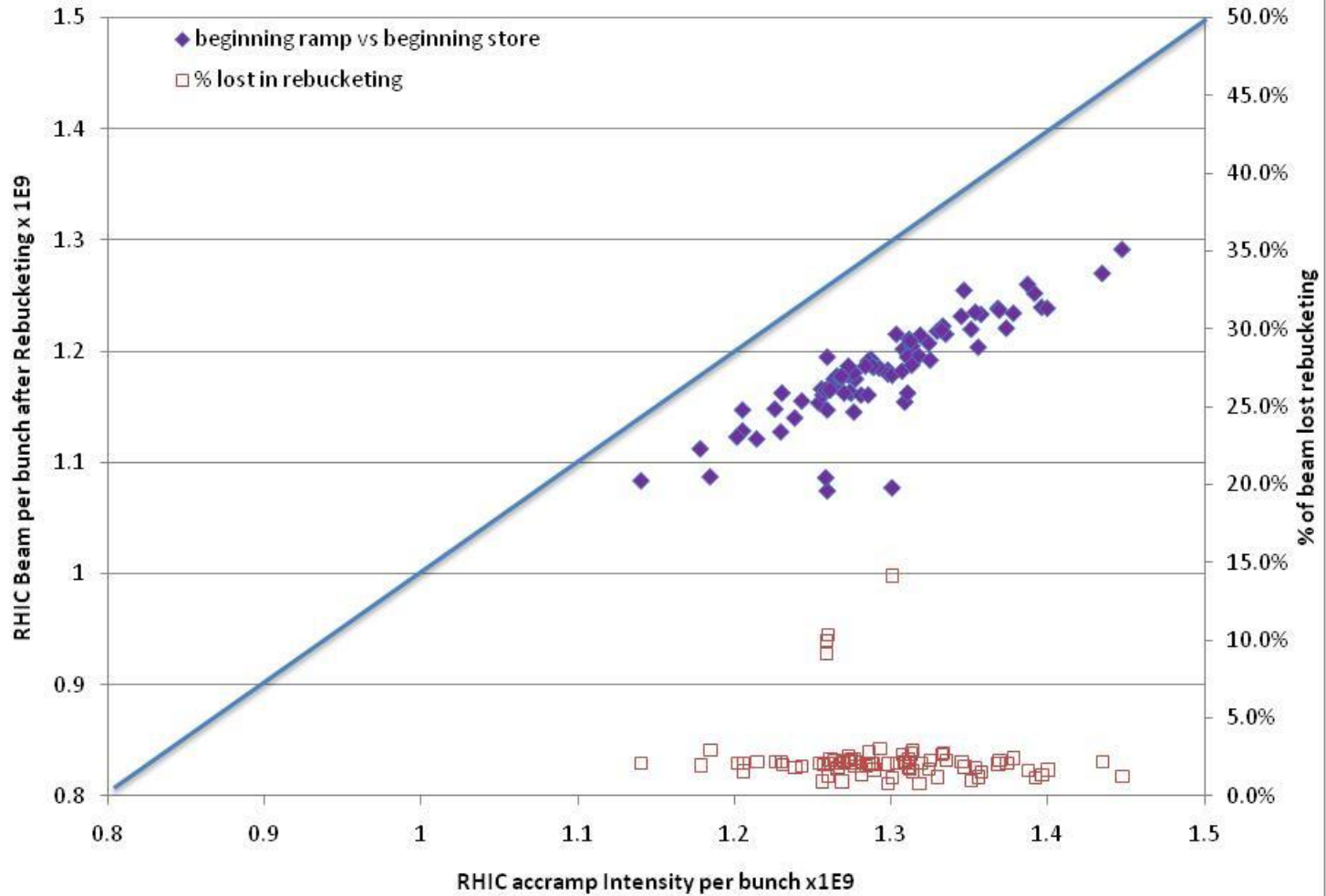
# Run 10, 62 GeV AuAu



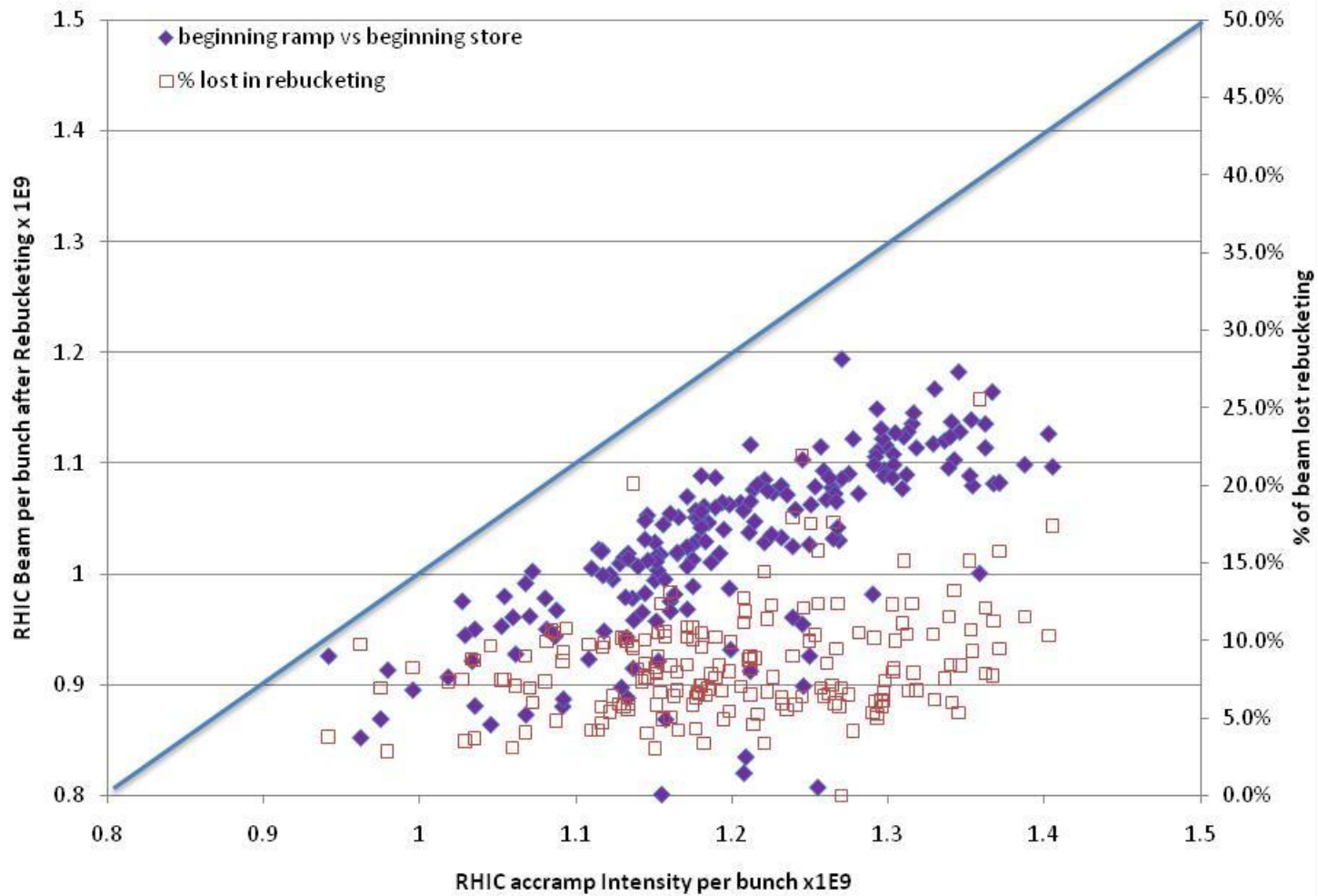
# Run 10, $\sqrt{s} = 200$ GeV AuAu



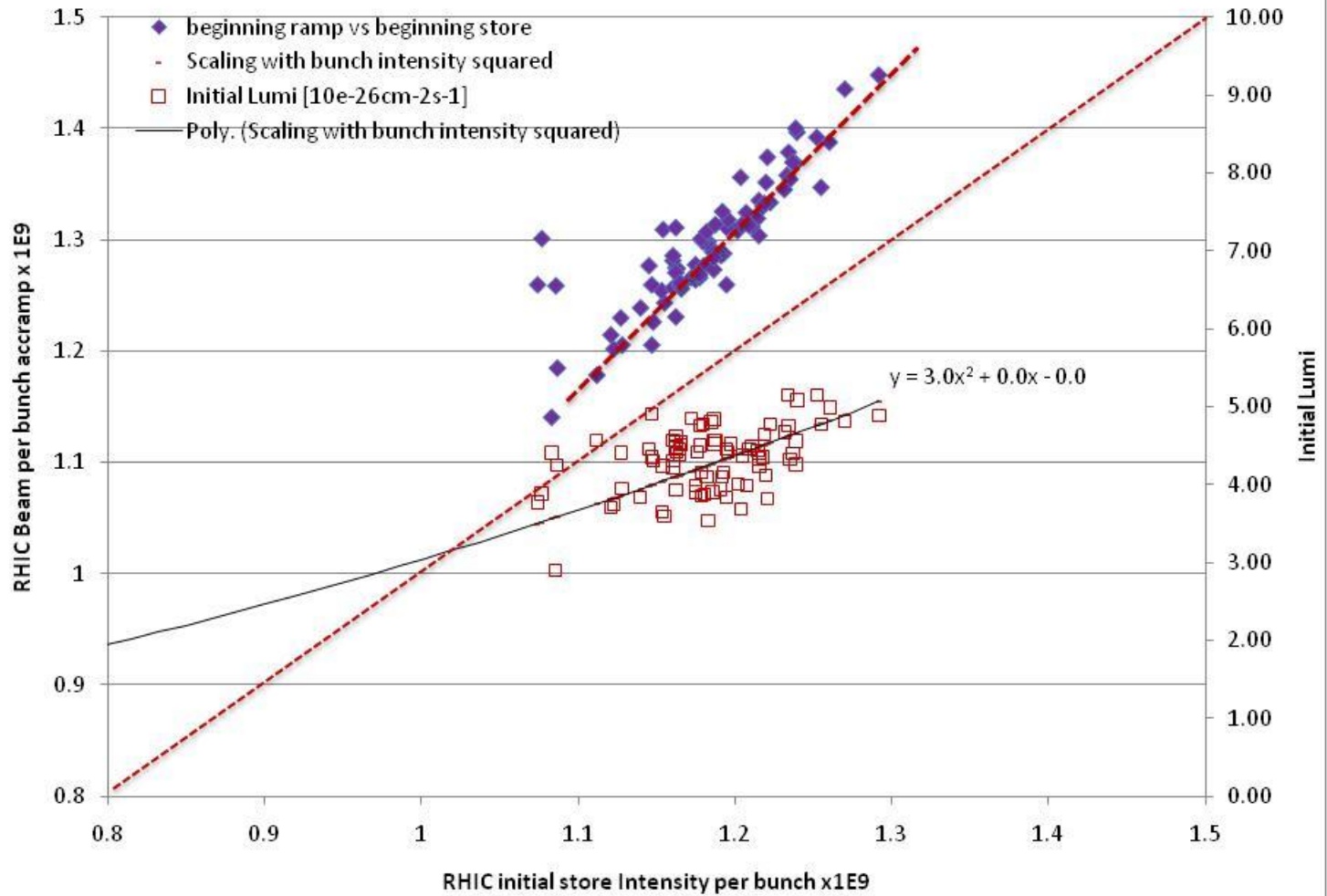
# Run 10, 62 GeV AuAu



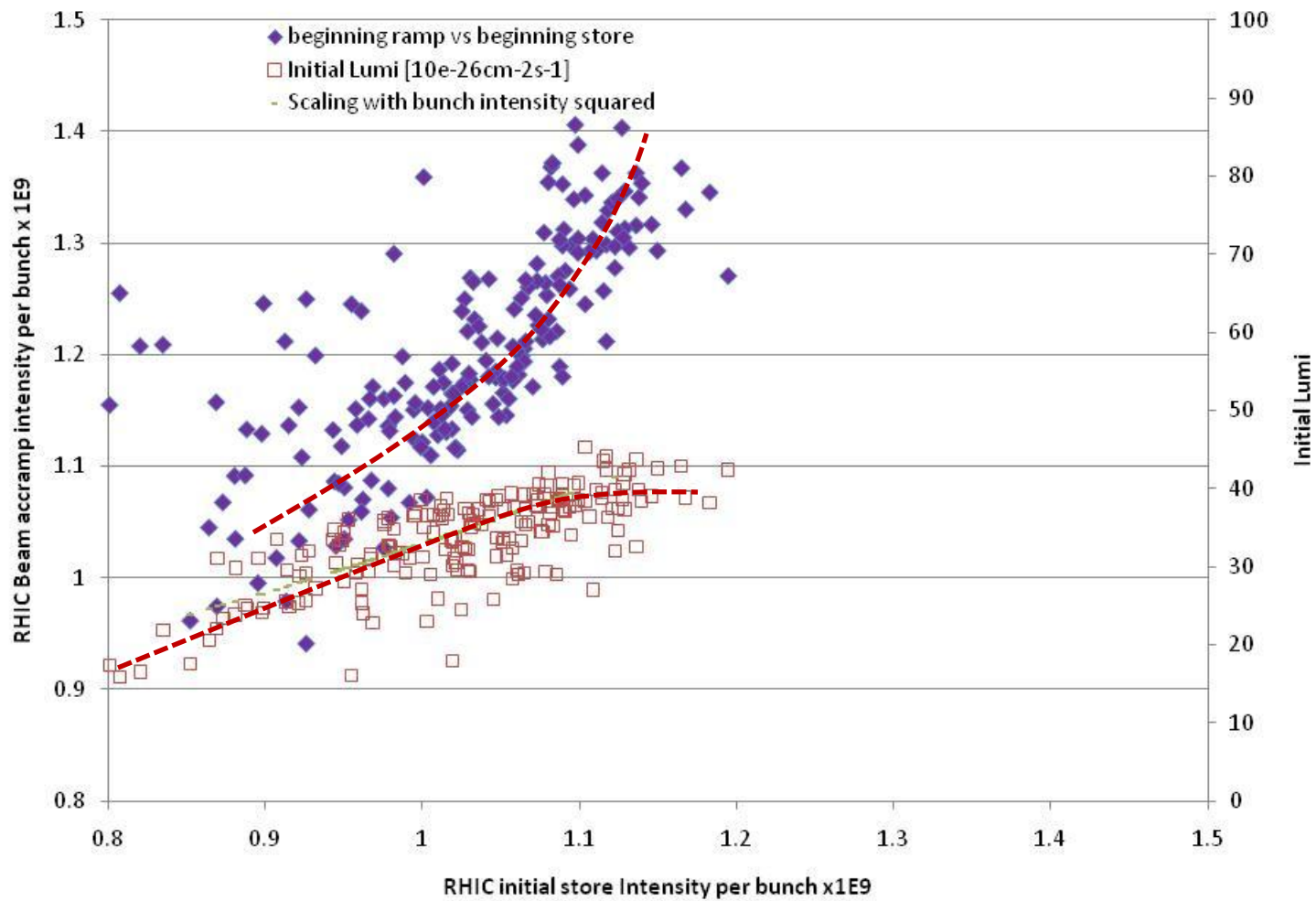
# Run 10, $\sqrt{s} = 200$ GeV AuAu



# Run 10, 62 GeV AuAu



# Run 10, $\sqrt{s} = 200$ GeV AuAu





# Run 10 Au-Au Goals

3/30/10

- STAR

- $\sqrt{s} = 62 \text{ GeV/n}$

- Luminosity Sampled/Delivered = ?/90  $\mu\text{b}^{-1}$

- 100M Min-bias events

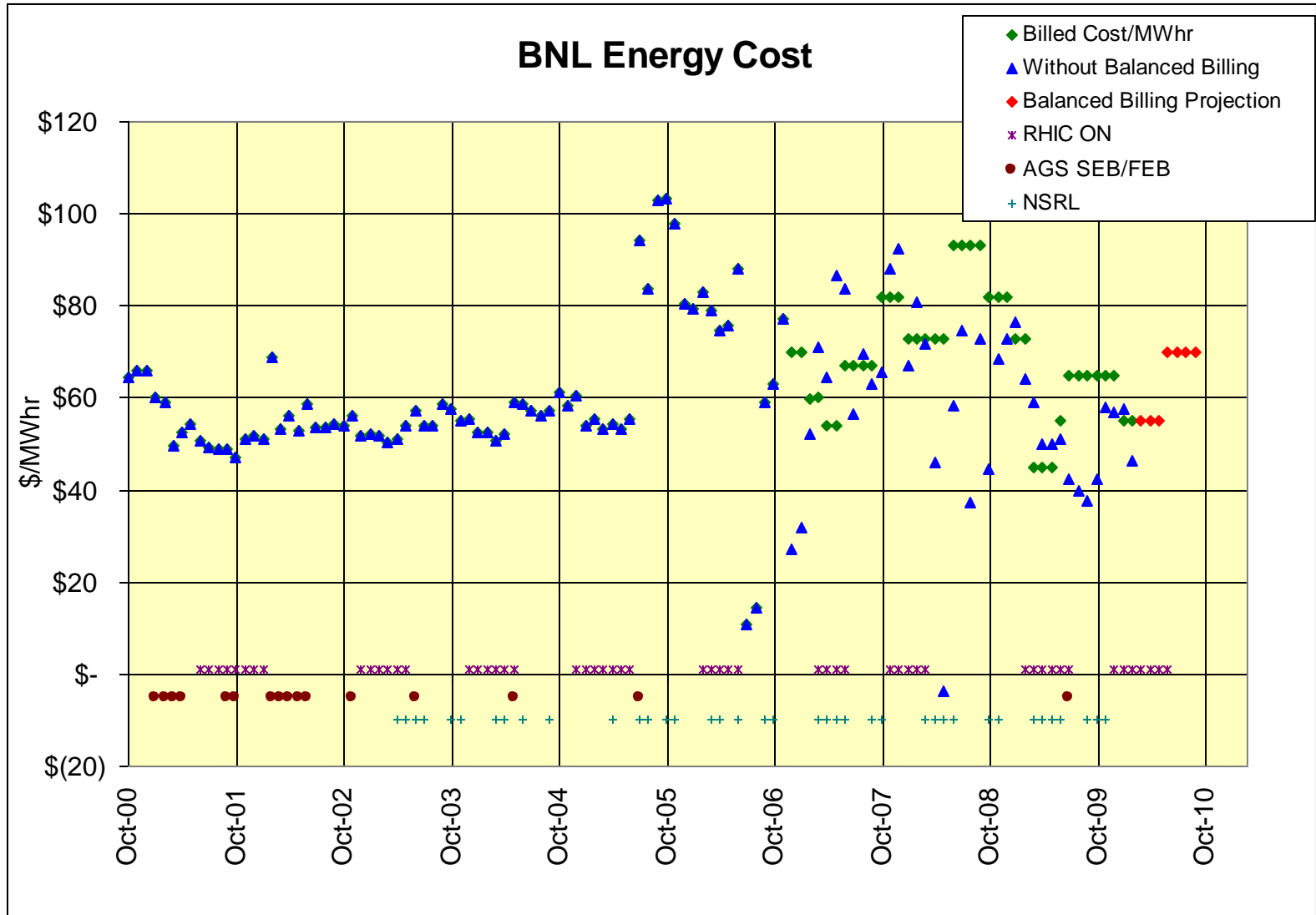
- PHENIX

- $\sqrt{s} = 62 \text{ GeV/n}$

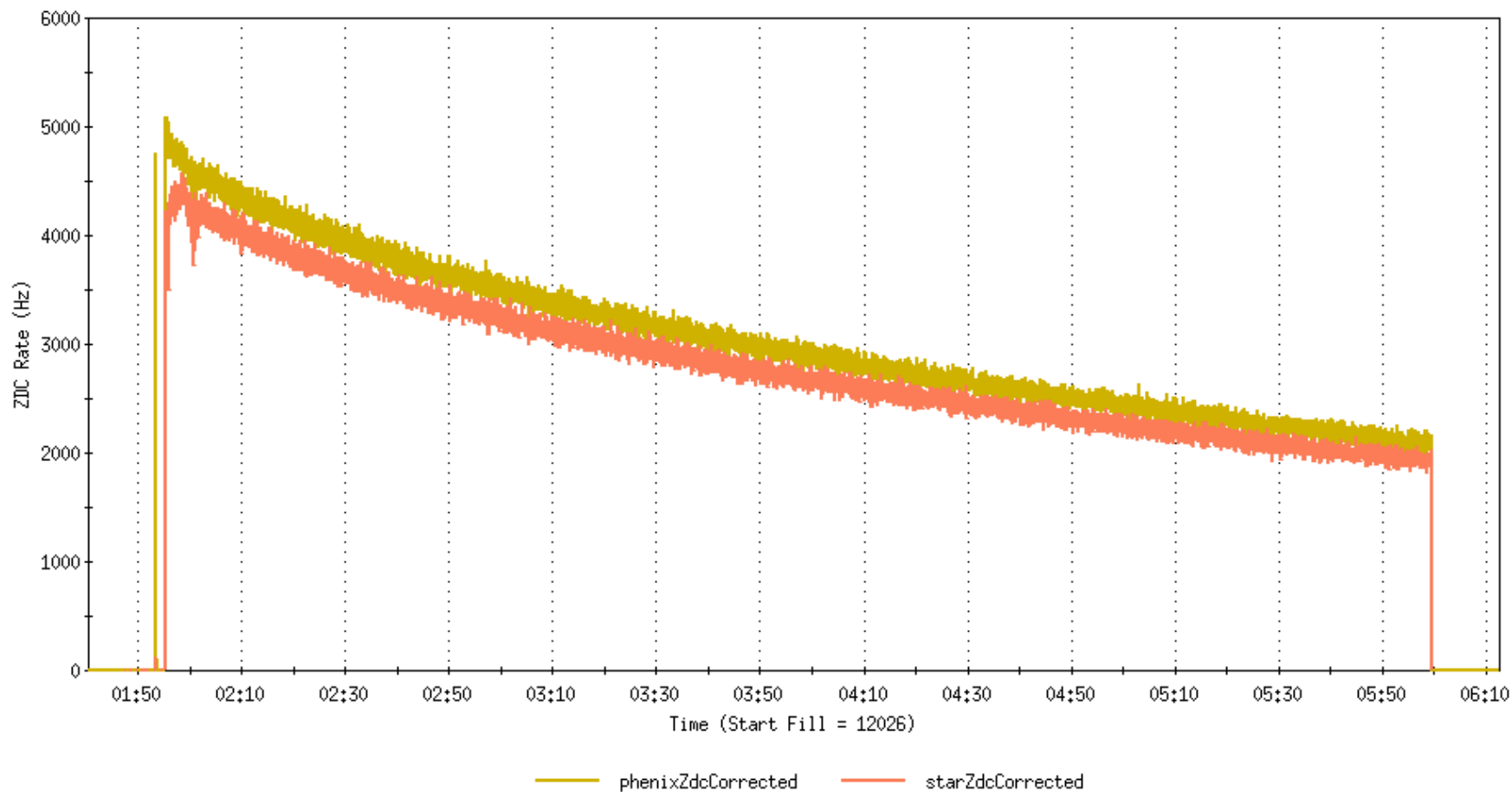
- Luminosity Recorded/Delivered = 64/193  $\mu\text{b}^{-1}$

- 400M Min-bias events

Through Feb 2010

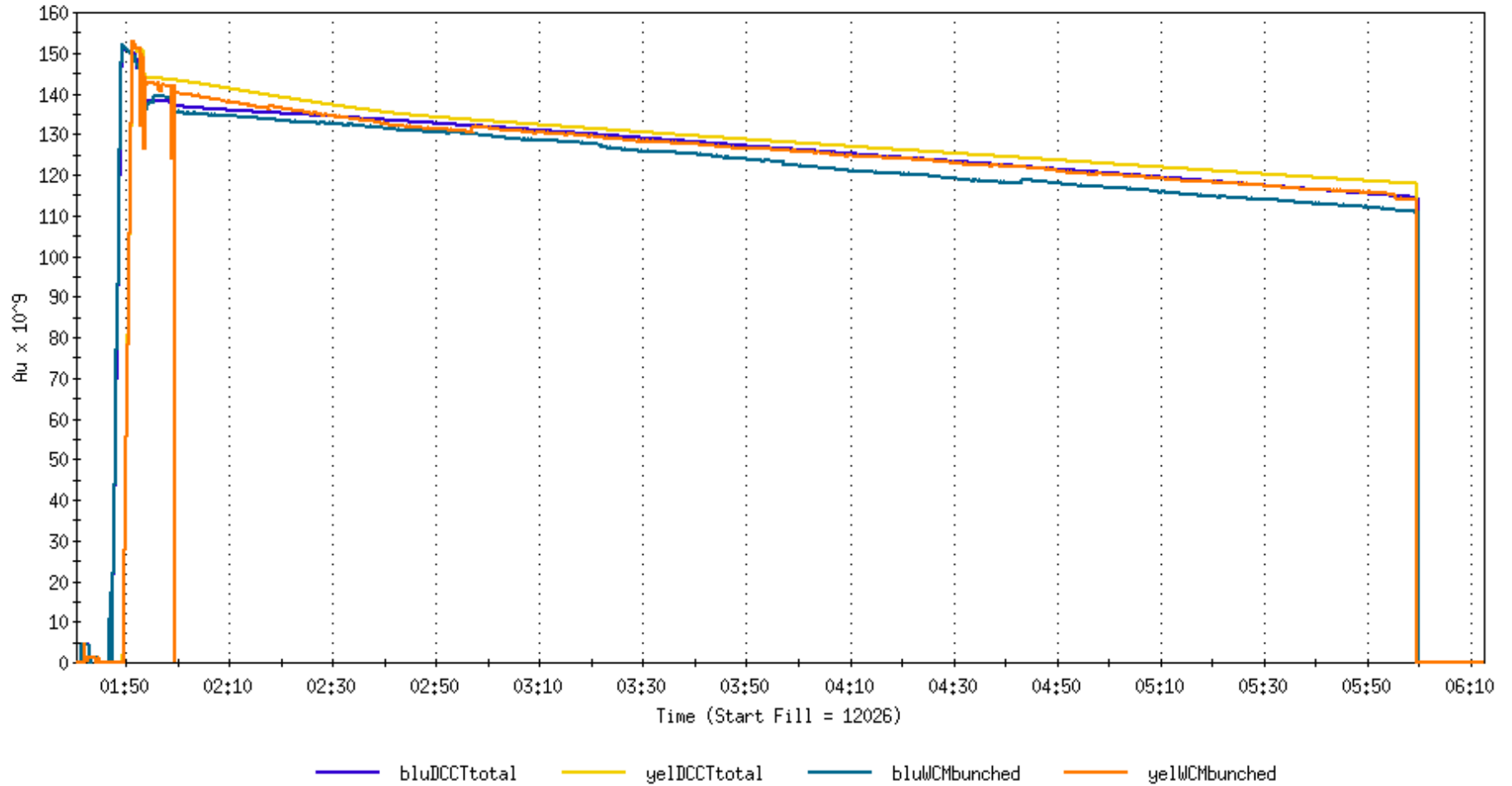


# First Store Monday, 29 March, Store 12026

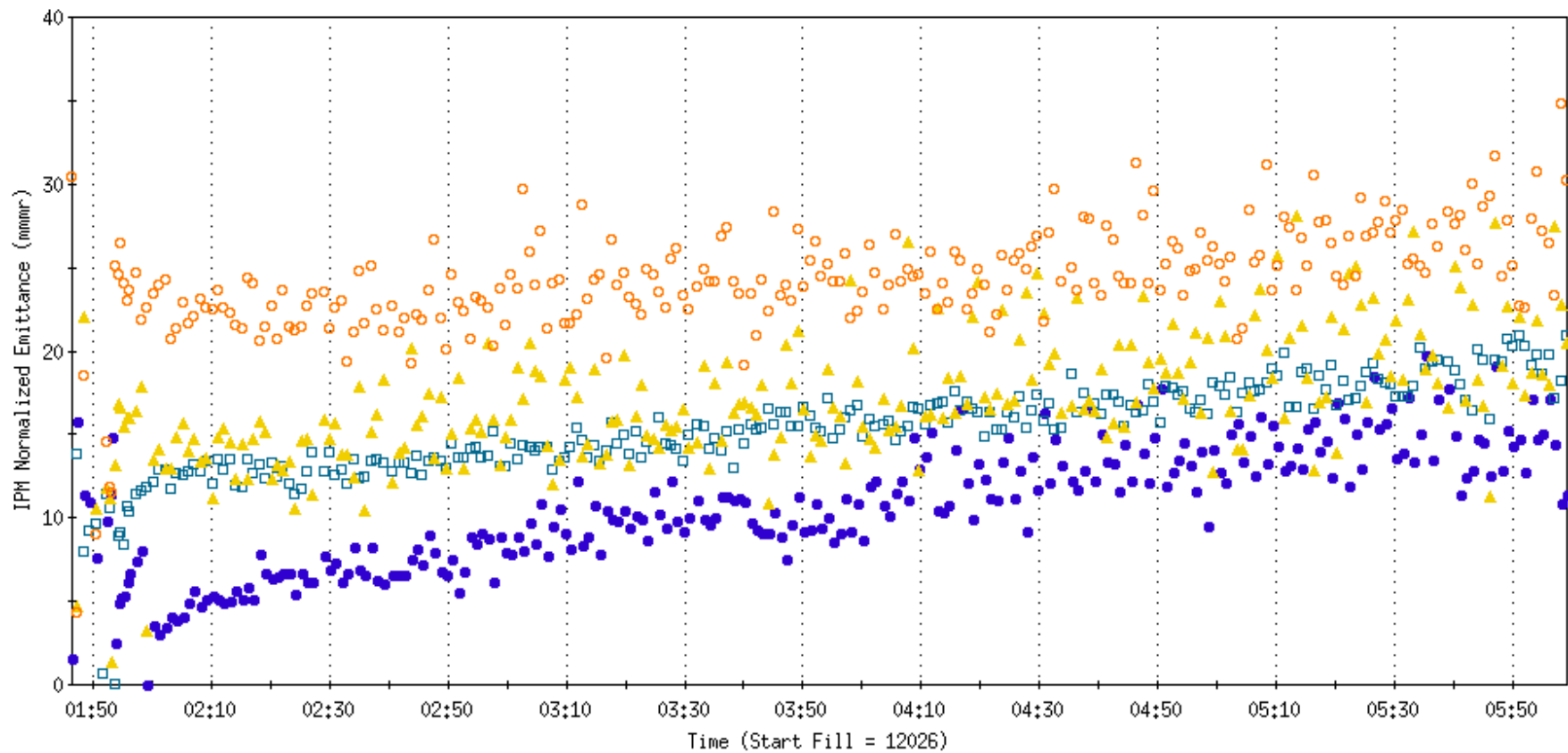


# First Store Monday, 29 March, Store 12026

RHIC - DCCT total beam & WCM bunched beam

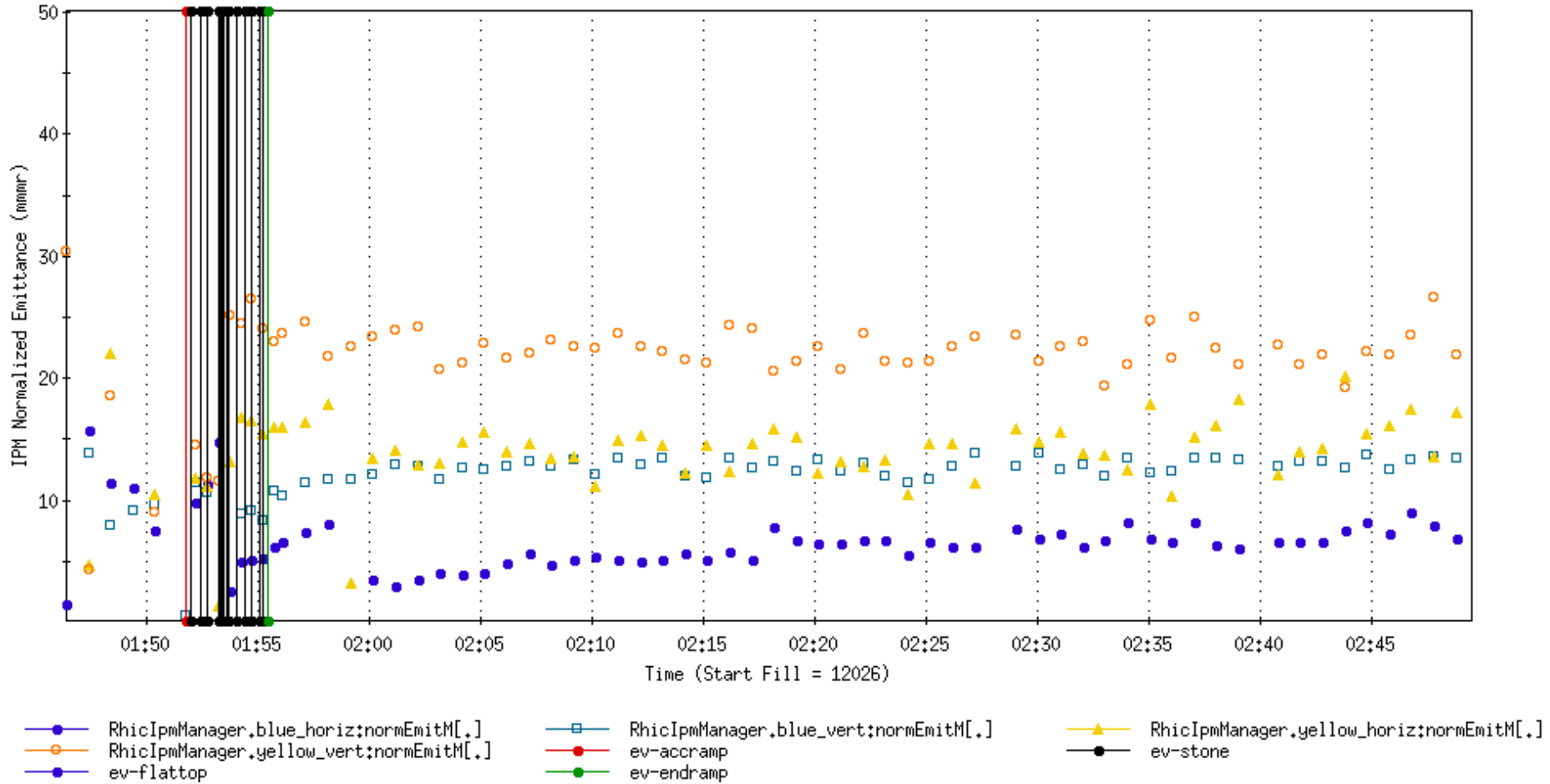


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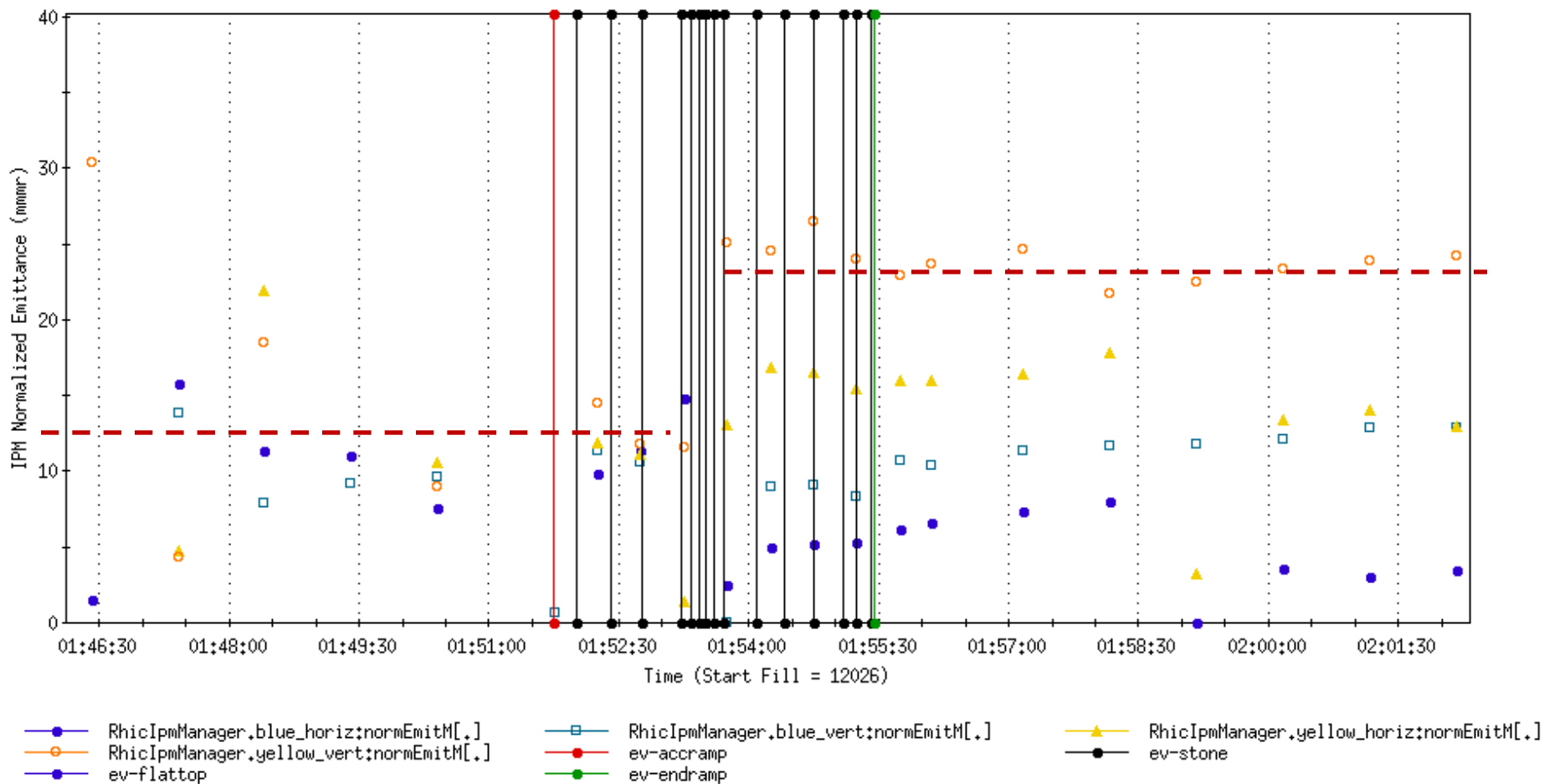


—●— RhicIpmManager,blue\_horiz;normEmitM[.]      —□— RhicIpmManager,blue\_vert;normEmitM[.]  
—▲— RhicIpmManager,yellow\_horiz;normEmitM[.]      —○— RhicIpmManager,yellow\_vert;normEmitM[.]

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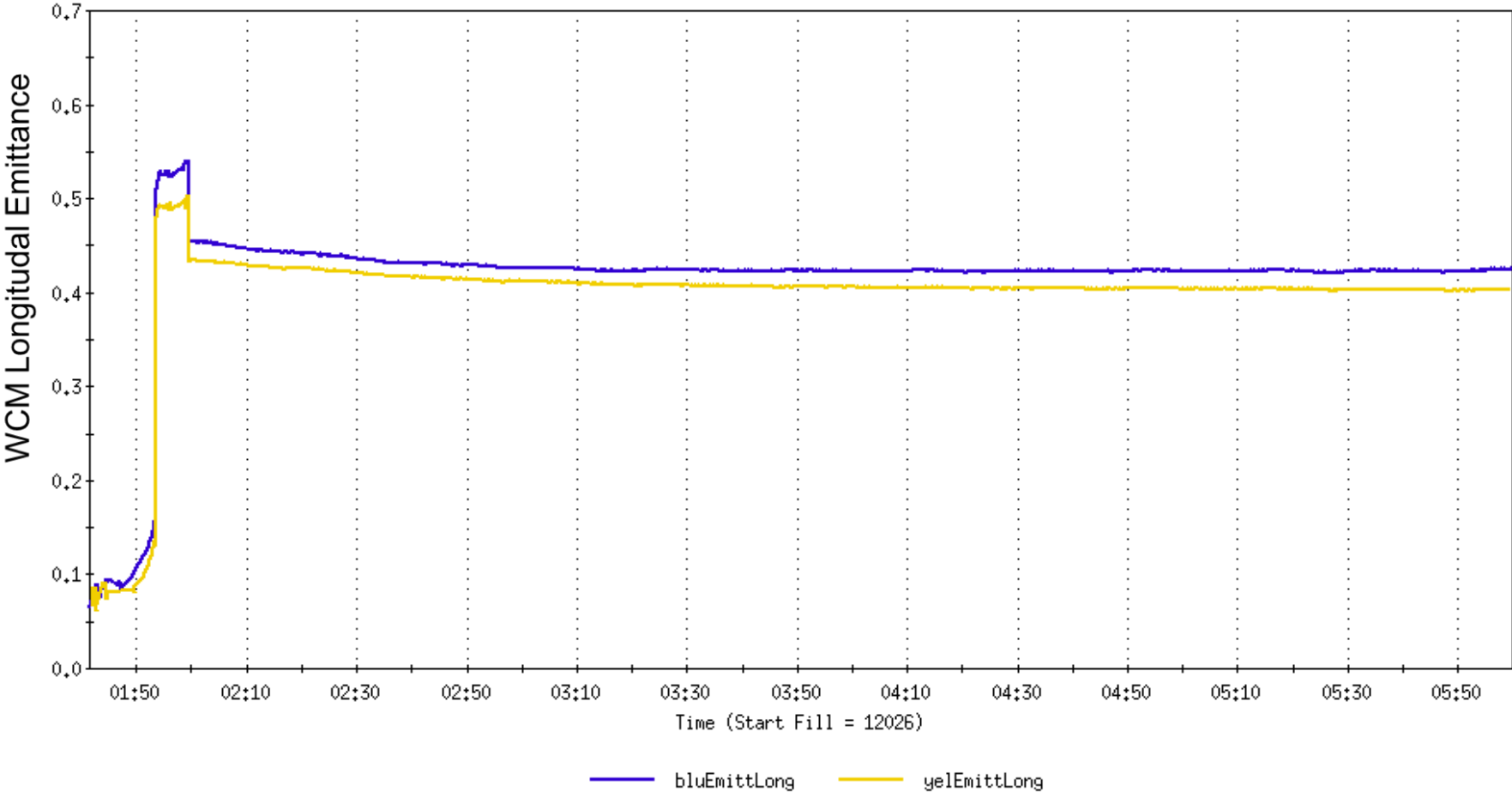


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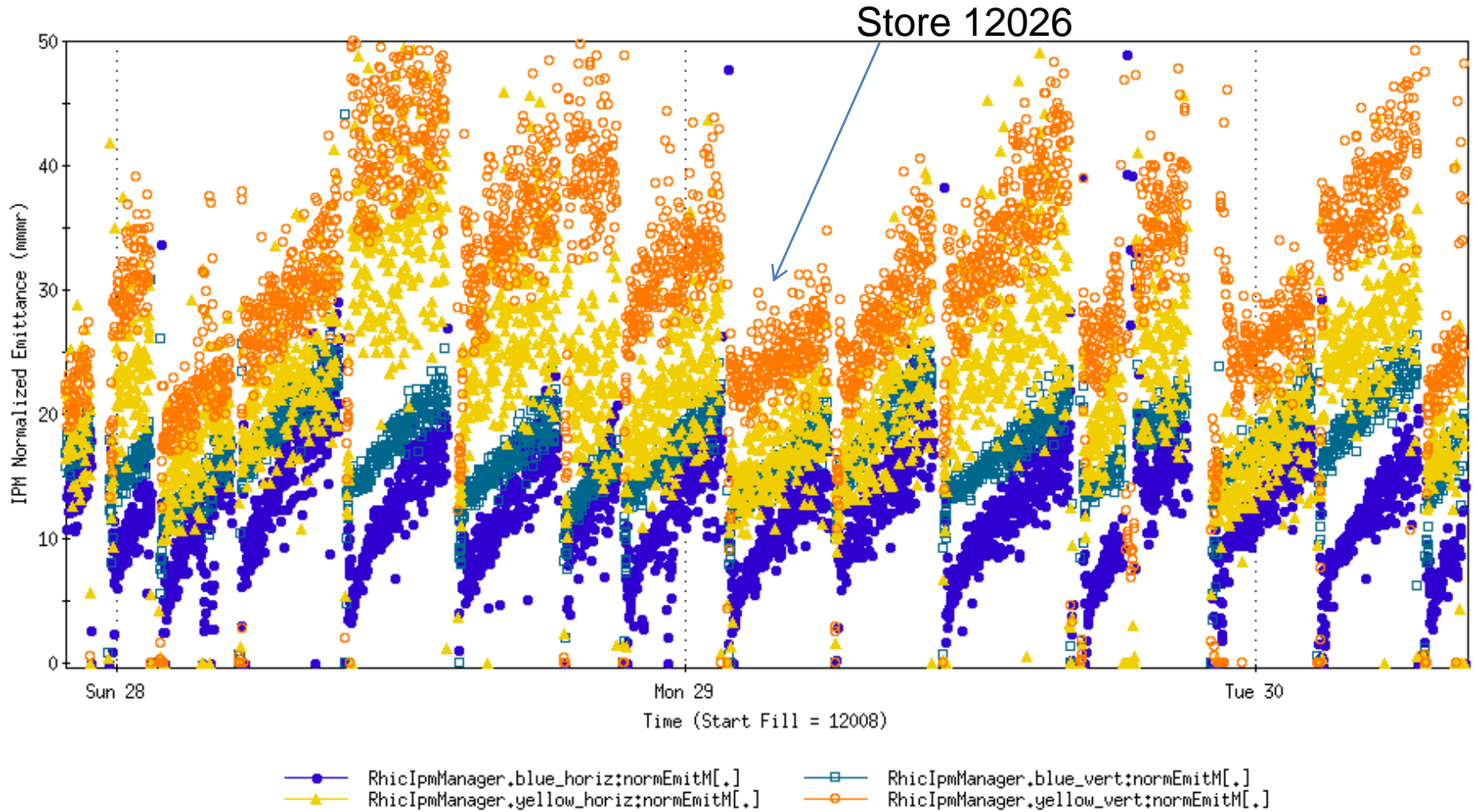
# First Store Monday, 29 March, Store 12026

Long Emitt from WCM

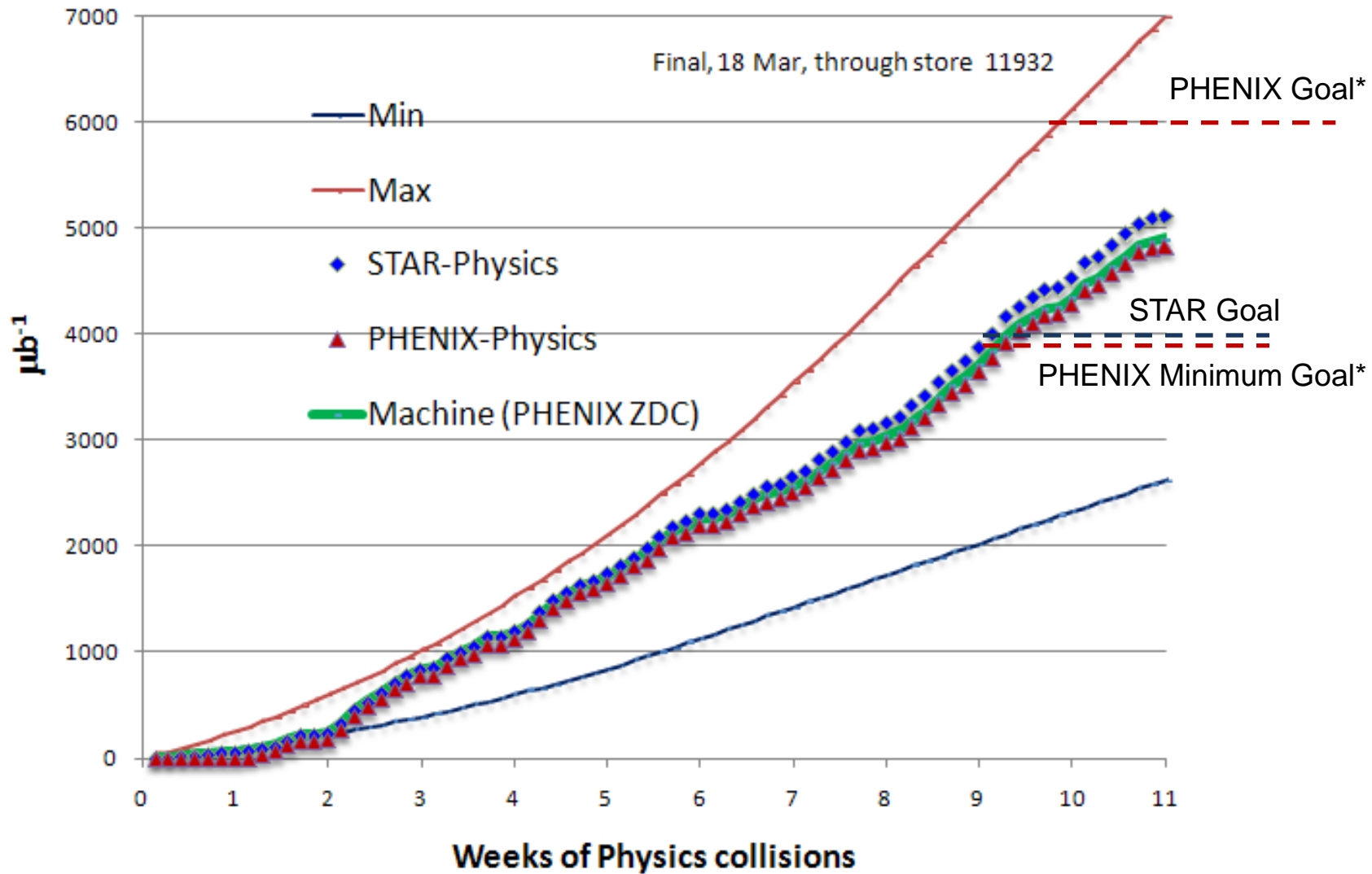




# 31 x 31 GeV/n Au horiz and vert emittances

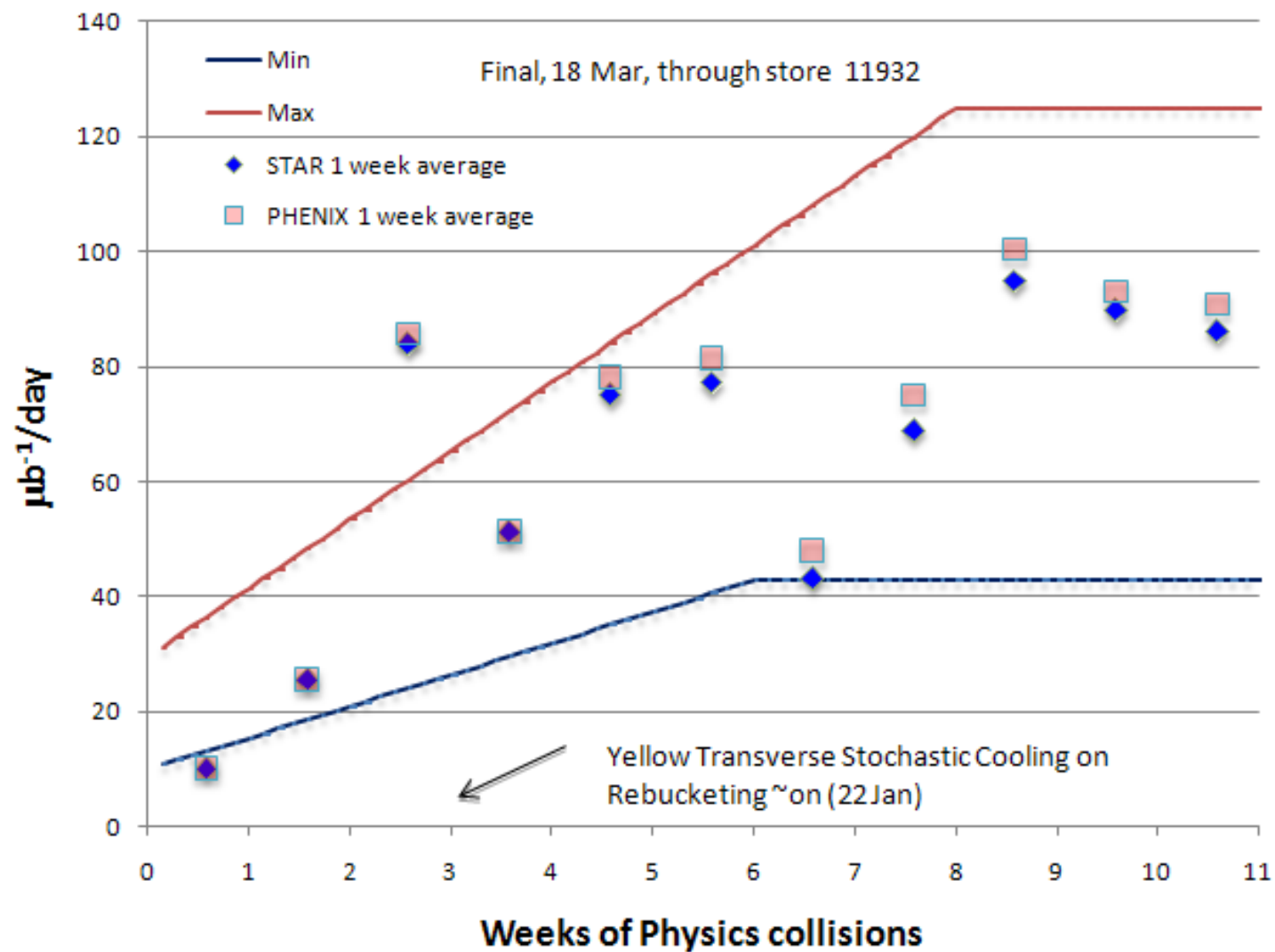


# Run 10 100 x 100 GeV/n Au Delivered Luminosity



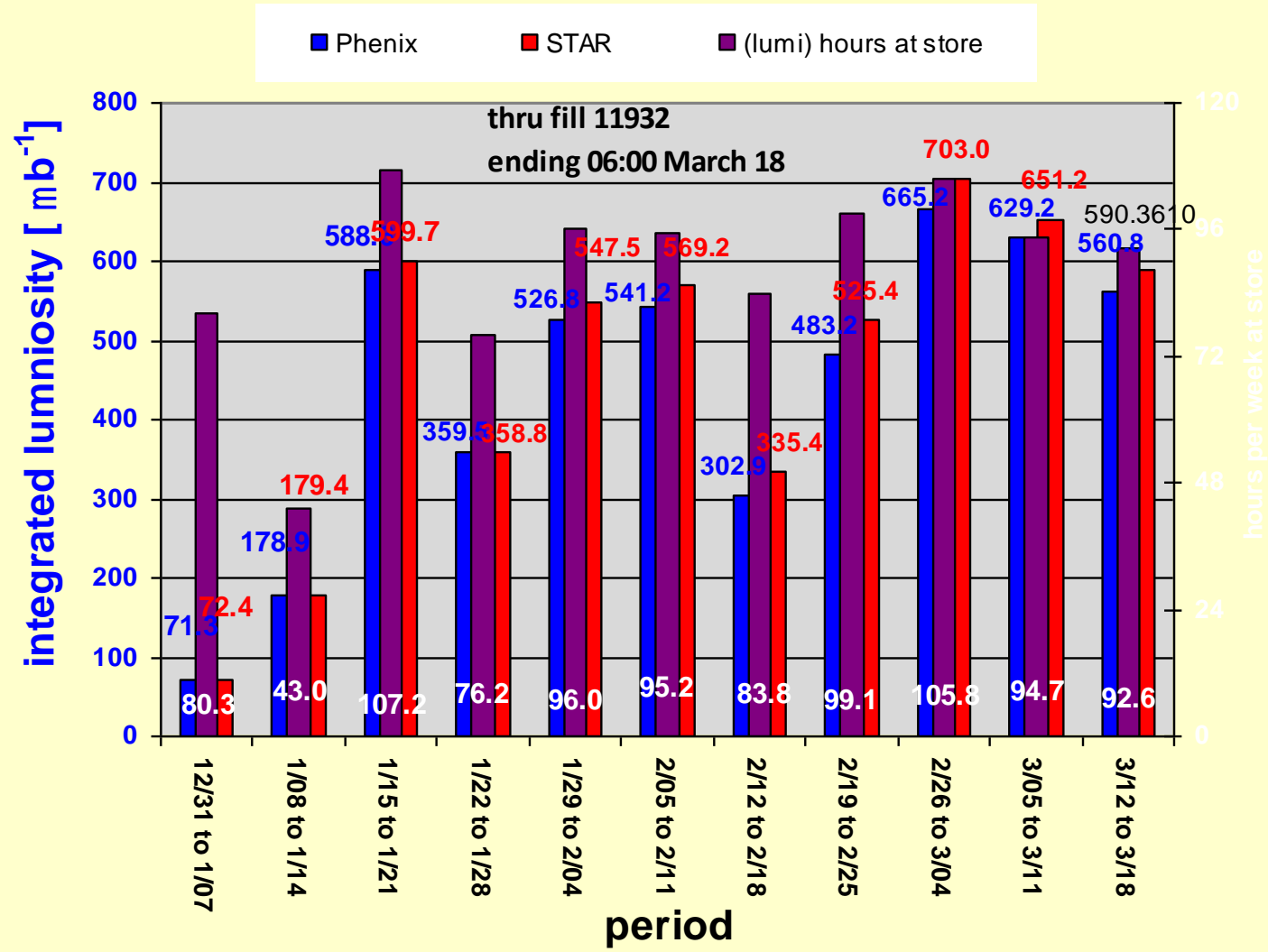
\* With 20 cm sigma IR diamond

## Run 10 100 x 100 GeV/n Au Delivered Luminosity per day

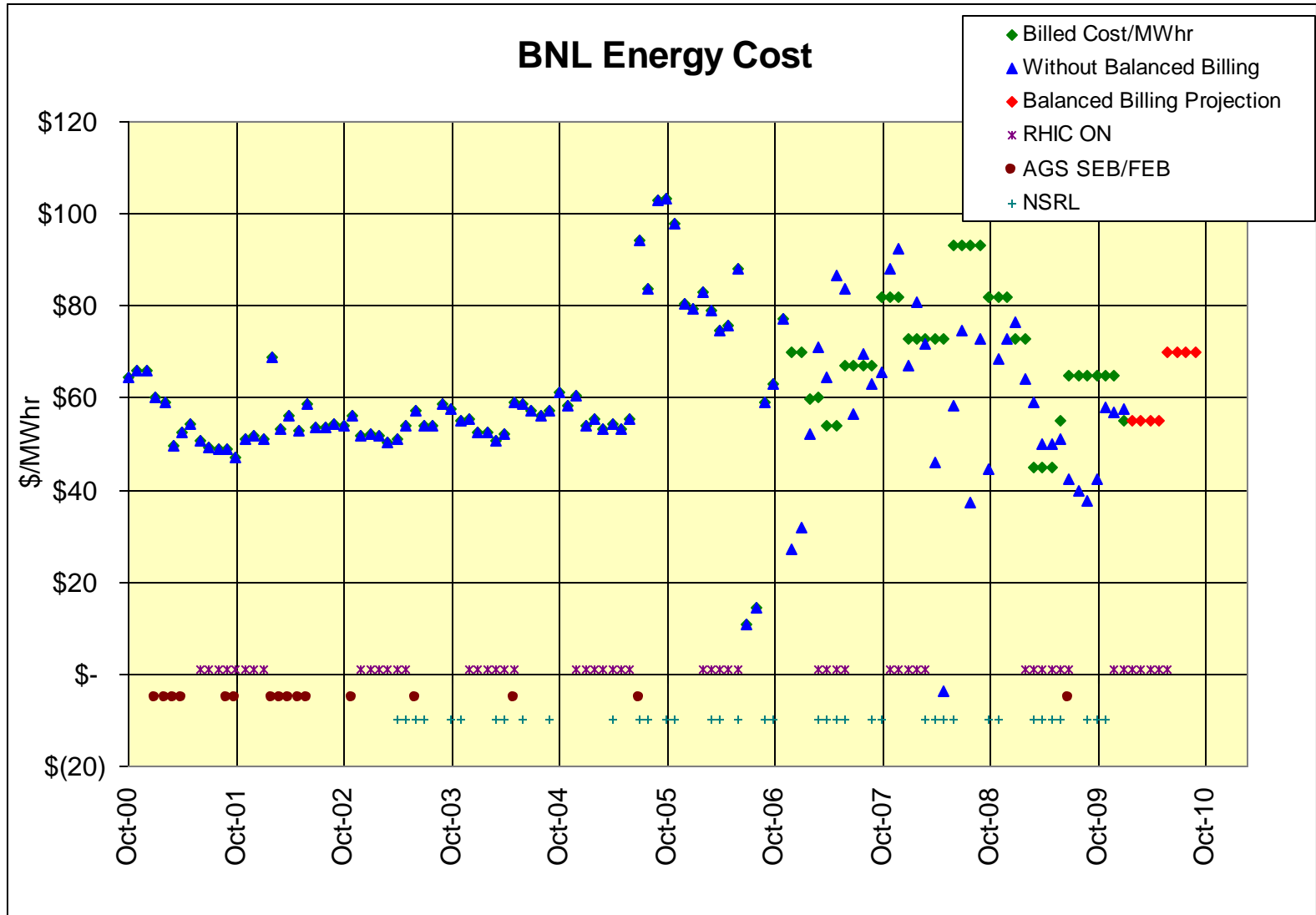


Average hours per week at store = 88.5

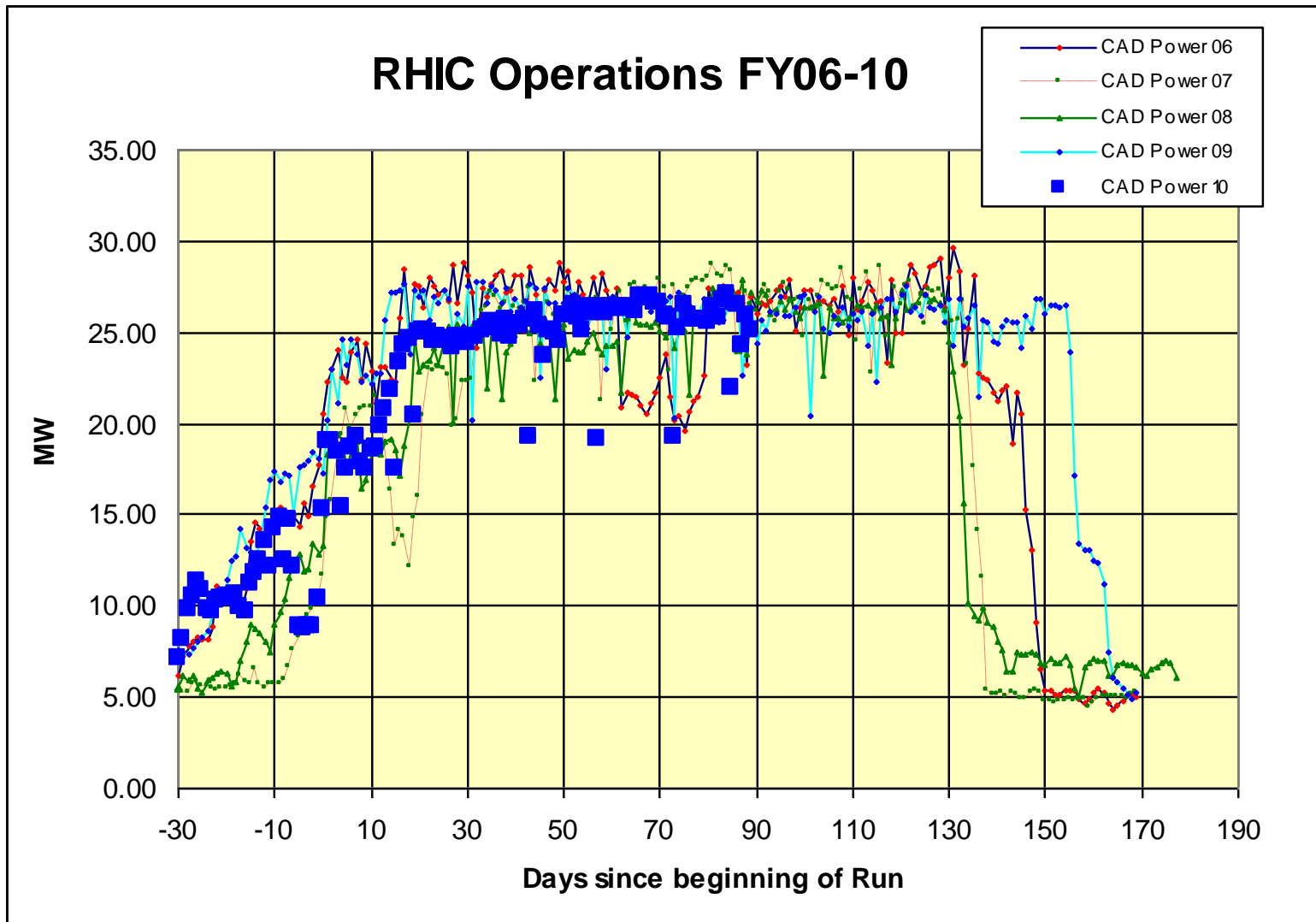
### Run 10 (AuAu) -- Integrated Luminosity by week



Through Jan 2010



Through 2/28/10



31 Dec 1<sup>st</sup> Physics Store 11340, 0.6 m  $\beta^*$  No cooling or rebucketing, STAR 3.2  $\mu\text{b}^{-1}$ , 2.6 hr store

Ring	Bunches/Cycles	Avg Bunch in RHIC (10 <sup>6</sup> ions)	Avg Efficiency XCBM to RHIC	XCBM to Uxf1	<i>Uxf1 to Wxf</i>	<i>Wxf to Arc</i>	<i>Arc to RHIC</i>
<b>Blue</b>	56/56	909	0.836	1.056	<i>0.963</i>	<i>0.992</i>	<i>0.828</i>
<b>Yellow</b>	56/56	990	0.971	1.085	<i>0.962</i>	<i>0.959</i>	<i>0.970</i>

18 Jan Physics Store 11489, 0.6 m  $\beta^*$  No cooling or rebucketing, STAR 22.6  $\mu\text{b}^{-1}$ , 3.9 hr store

Ring	Bunches/Cycles	Avg Bunch in RHIC (10 <sup>6</sup> ions)	Avg Efficiency XCBM to RHIC	XCBM to Uxf1	<i>Uxf1 to Wxf</i>	<i>Wxf to Arc</i>	<i>Arc to RHIC</i>
<b>Blue</b>	111/28	1196	0.911	1.024	<i>0.961</i>	<i>0.999</i>	<i>0.927</i>
<b>Yellow</b>	111/29	1168	0.879	1.023	<i>0.961</i>	<i>0.989</i>	<i>0.905</i>

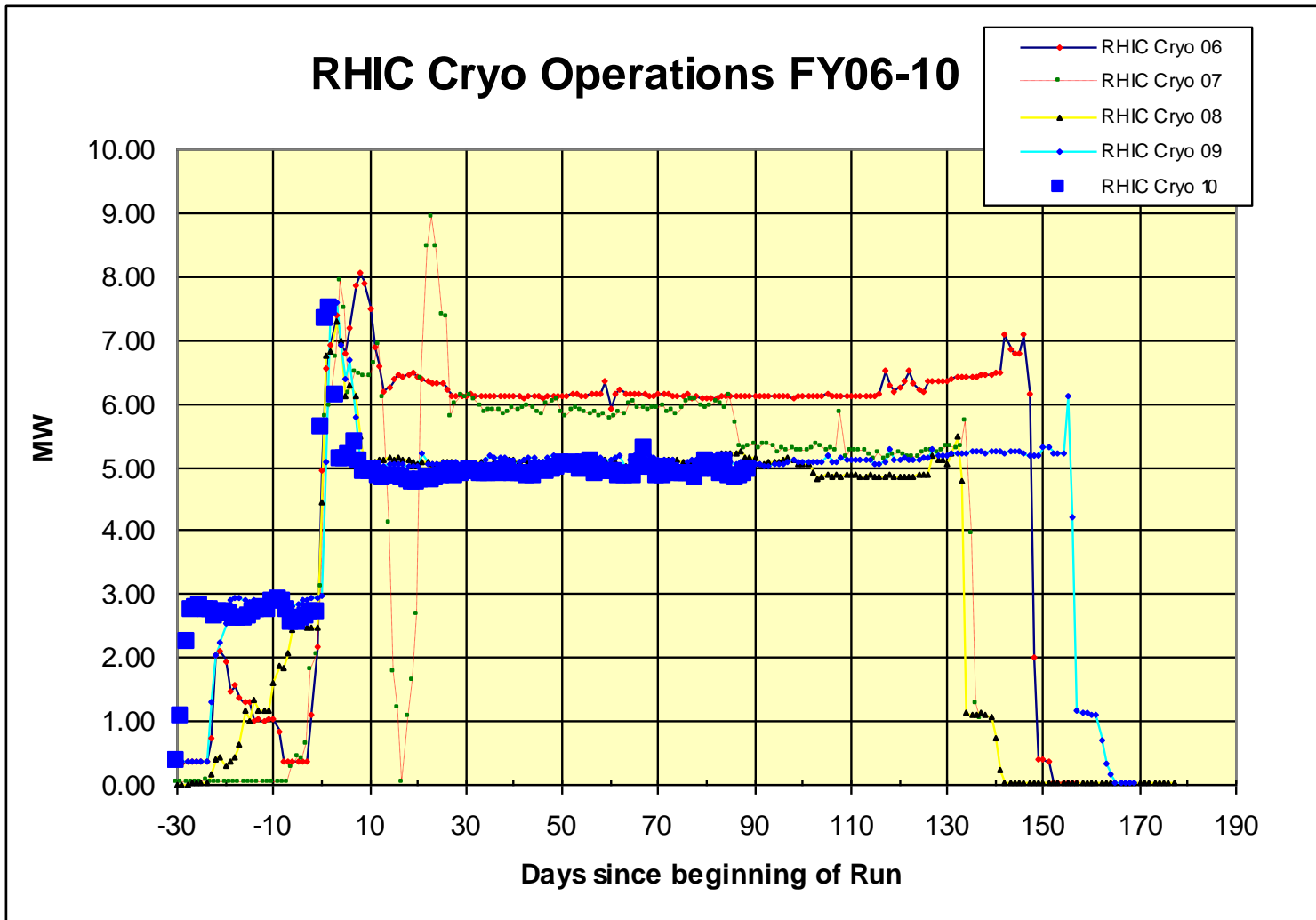
28 Feb Physics Store 11824, 0.7 m  $\beta^*$  with some cooling and with rebucketing, STAR 32.7  $\mu\text{b}^{-1}$ , 3.9 hr store

Ring	Bunches/Cycles	Avg Bunch in RHIC (10 <sup>6</sup> ions)	Avg Efficiency XCBM to RHIC	XCBM to Uxf1	<i>Uxf1 to Wxf</i>	<i>Wxf to Arc</i>	<i>Arc to RHIC</i>
<b>Blue</b>	111/28	1262	0.917	0.975	<i>0.961</i>	<i>1.001</i>	<i>0.977</i>
<b>Yellow</b>	111/28	1246	0.910	0.961	<i>0.964</i>	<i>0.988</i>	<i>0.994</i>

2 Mar Physics Store 11834, 0.7 m  $\beta^*$  with some cooling and with rebucketing, STAR 29.4  $\mu\text{b}^{-1}$ , 3.9 hr store)

Ring	Bunches/Cycles	Avg Bunch in RHIC (10 <sup>6</sup> ions)	Avg Efficiency XCBM to RHIC	XCBM to Uxf1	<i>Uxf1 to Wxf</i>	<i>Wxf to Arc</i>	<i>Arc to RHIC</i>
<b>Blue</b>	111/28	1354	0.927	0.990	<i>0.965</i>	<i>1.003</i>	<i>0.968</i>
<b>Yellow</b>	111/28	1377	0.931	0.990	<i>0.964</i>	<i>0.989</i>	<i>0.987</i>

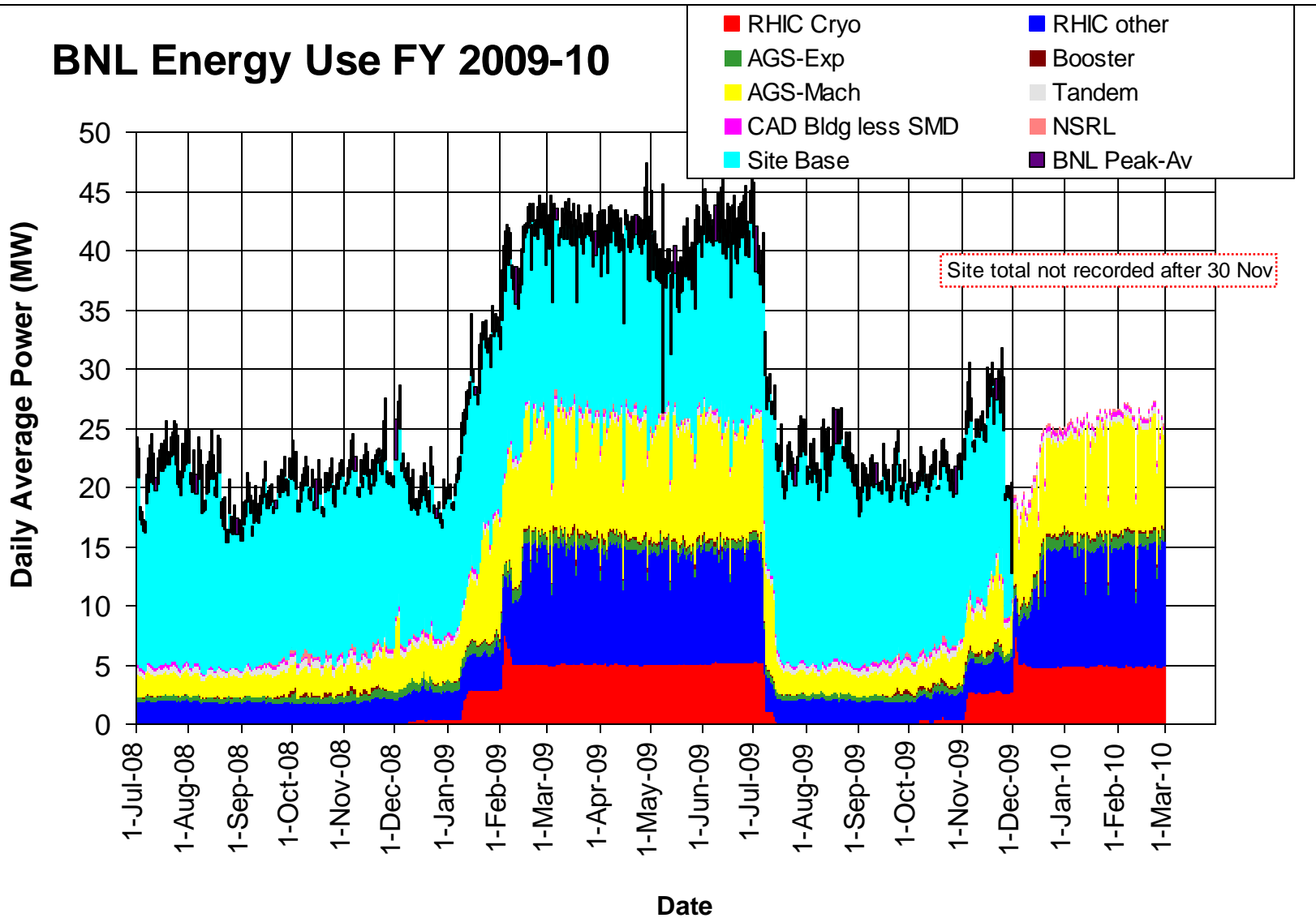
Through 2/28/10





Through 2/28/10

# BNL Energy Use FY 2009-10



## Revised Run 10 Plan, Nov 25, 2009

$\sqrt{s_{NN}}$ (GeV)	Physics production or beam studies weeks	
	25-cryoweek run	27-cryoweek run
200	10	10
62.4	4	4
39	1.5	1.5
27	0	0
18	0	0
11.5 @ STAR	0	2
7.7	4	4
Beam studies @ 5 GeV and @ $v \approx 0.67$	0.5	0.5

# Run 10 Au-Au Goals

11/19/09

- STAR

- $\sqrt{s} = 200 \text{ GeV/n}$

- Luminosity Sampled/Delivered = 2/4 nb<sup>-1</sup>
    - 250M Central Events
    - 300M Min-bias events

- PHENIX

- $\sqrt{s} = 200 \text{ GeV/n}$

- Luminosity Recorded/Delivered = 1.4/>6 nb<sup>-1</sup>
    - Minimum Goal:
      - Luminosity Recorded/Delivered = 1.1/3.9 nb<sup>-1</sup>

Time from start of 4.5 deg cooldown to Physics

