

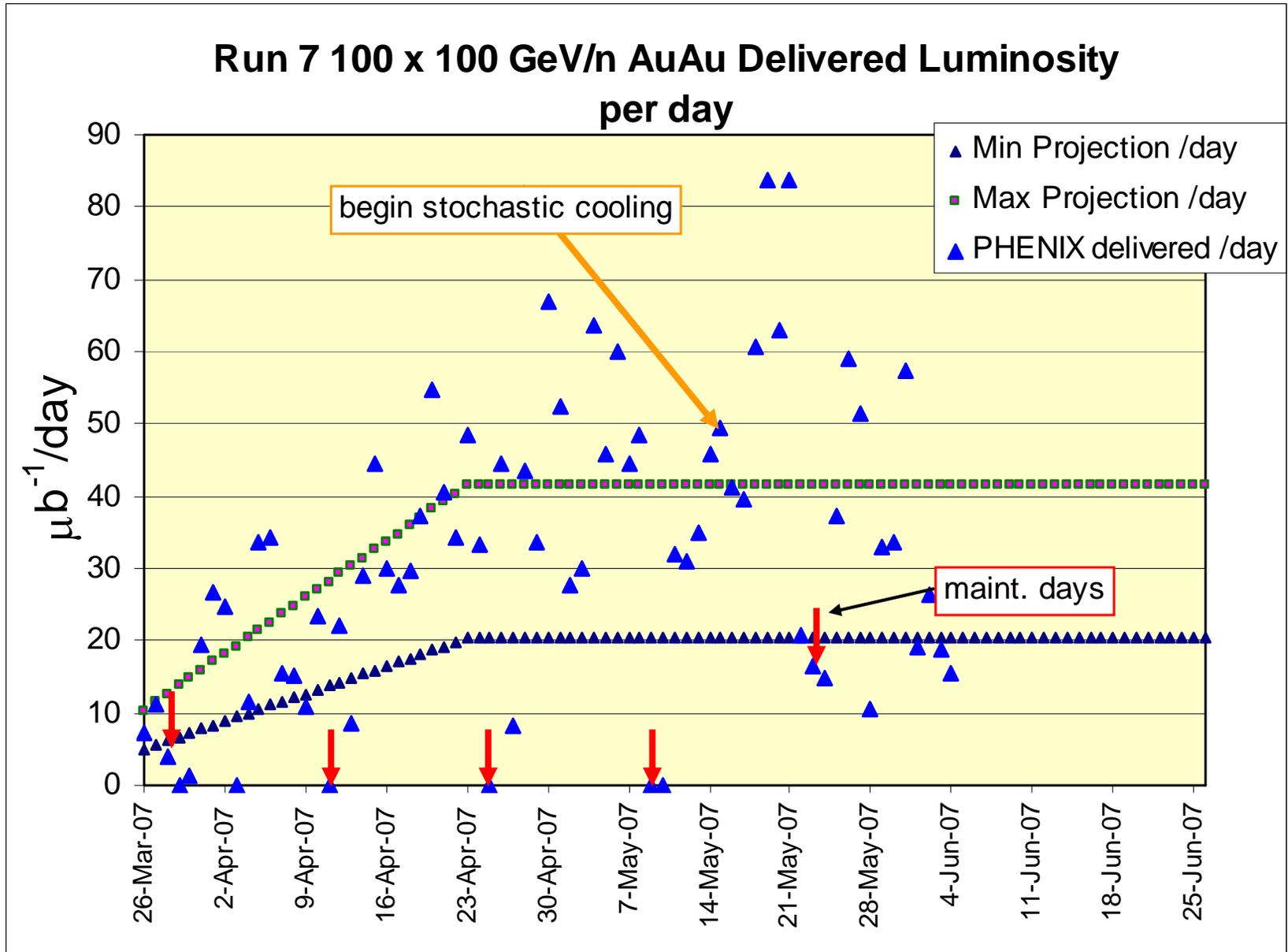
RHIC Machine/Detector Planning Meeting

Agenda

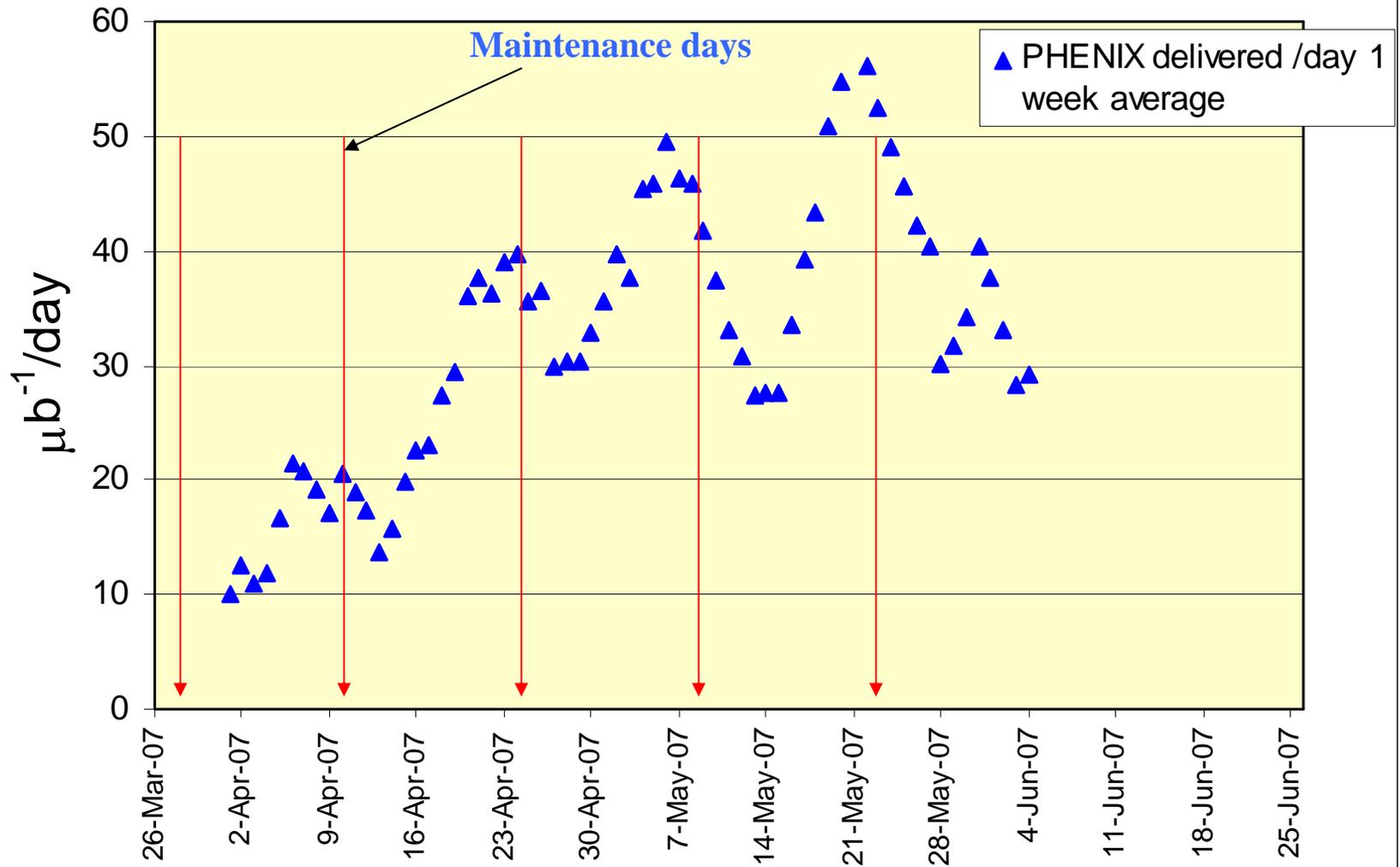
- Special topic – Stochastic cooling improvement factor
- **Scheduling Physicist Issues (Gardner)**
- **Experiment Issues**
 - **PHENIX (Leitch)**
 - **STAR (Christie)**
 - **Monopole (Dzhordzhadze)**
- **Machine Issues - (Drees)**
- **RHIC Beam Experiments - (Pilat)**
- **RCF Issues - (Throwe)**

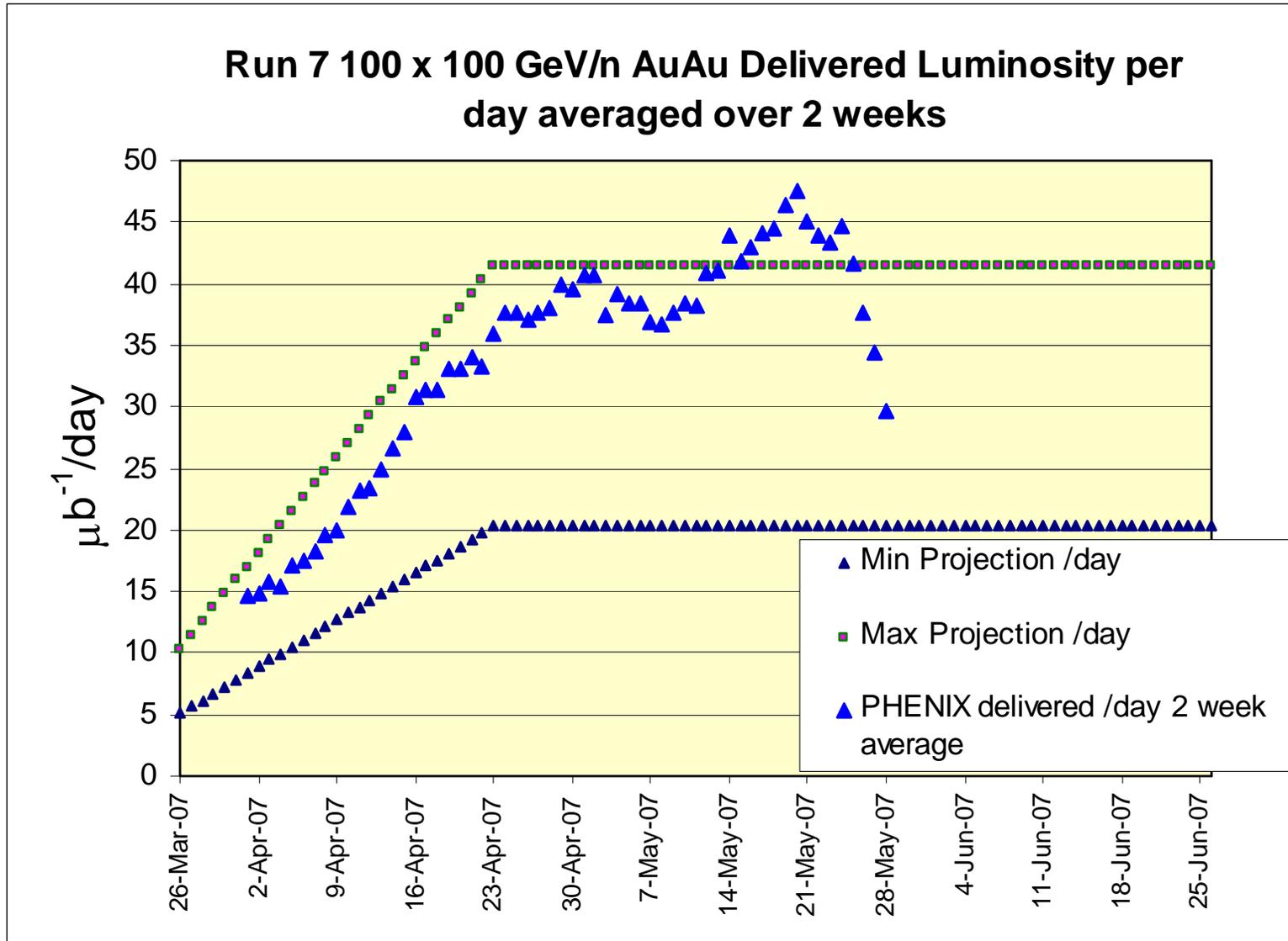
RHIC Run 7 as run/planned

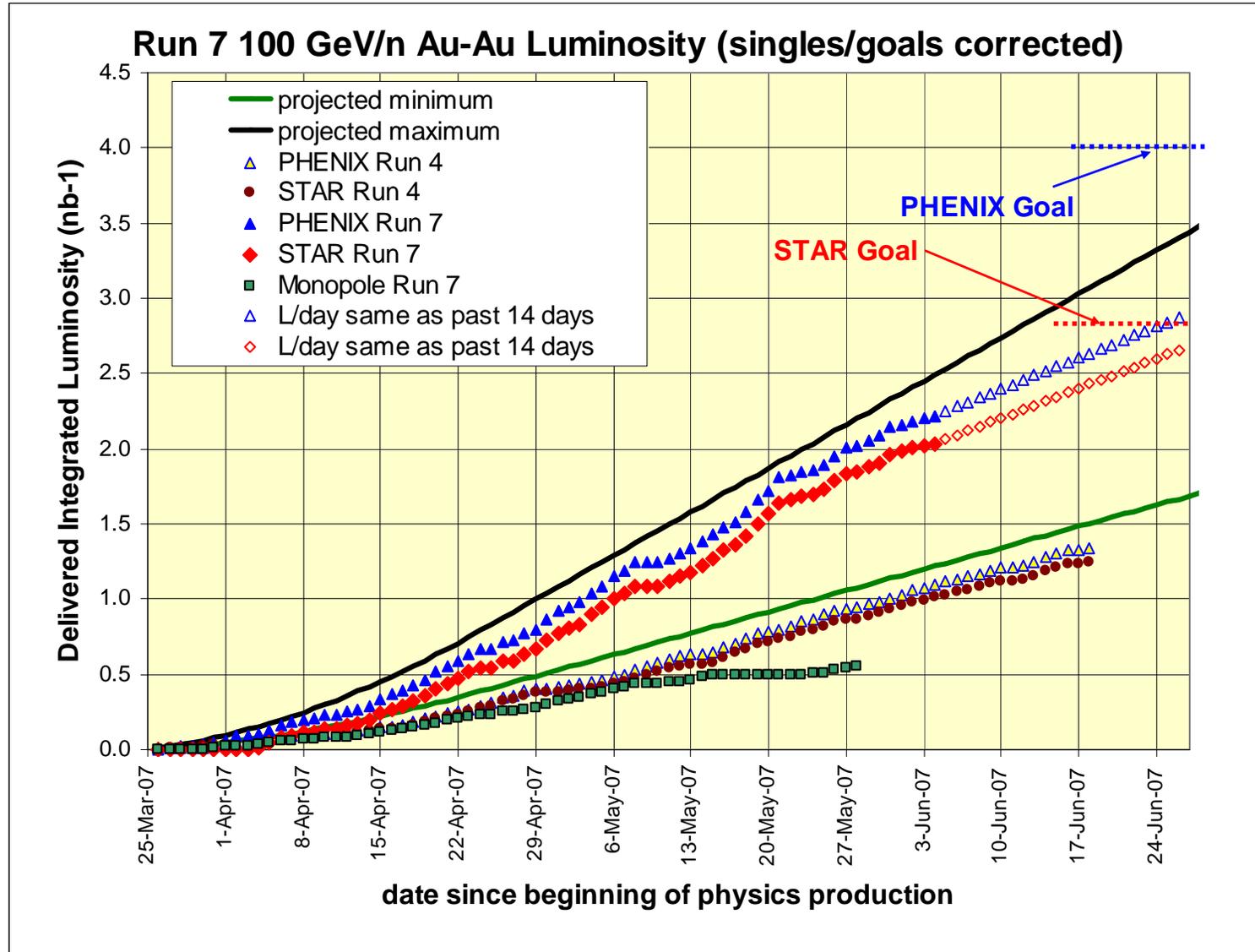
- 12 Feb – cool-down begins
- 17 Feb – blue cold
- 20 Feb – 1st beam in blue ring
- 23 Feb – Initial cold wave through yellow ring, not ready for beam
- 24 Feb – cryo problems, cool-down interrupted
- 26 Feb – cryo problems persist, begin warming up cryo plant
- 4 Mar – cryo back on
- 8 Mar – Blue cold again, ready for power supply setup/beam
- 12 Mar – Yellow cold, ready for power supply setup (lost 2.0 weeks)
- 13 Mar – Beam in Yellow, begin 10 day setup with beams
- 20 Mar – Begin ramp-up mode, overnight stores for experiments
- **26 Mar – 100 x 100 GeV/n AuAu Physics declared (Machine)**
- **27 Mar – PHENIX Physics declared**
- 28 Mar – 1st Maintenance day
- **3 Apr - STAR Physics declared**
- **5 Jun - 21 days to go!**
- **6-7 Jun – 24 hour low energy development run**
- 26 Jun –end physics (13.1 weeks), begin warm-up to LN2
- 30 Jun – RHIC Cryo switch to LN2 complete, end 19.7 weeks of cryo operation

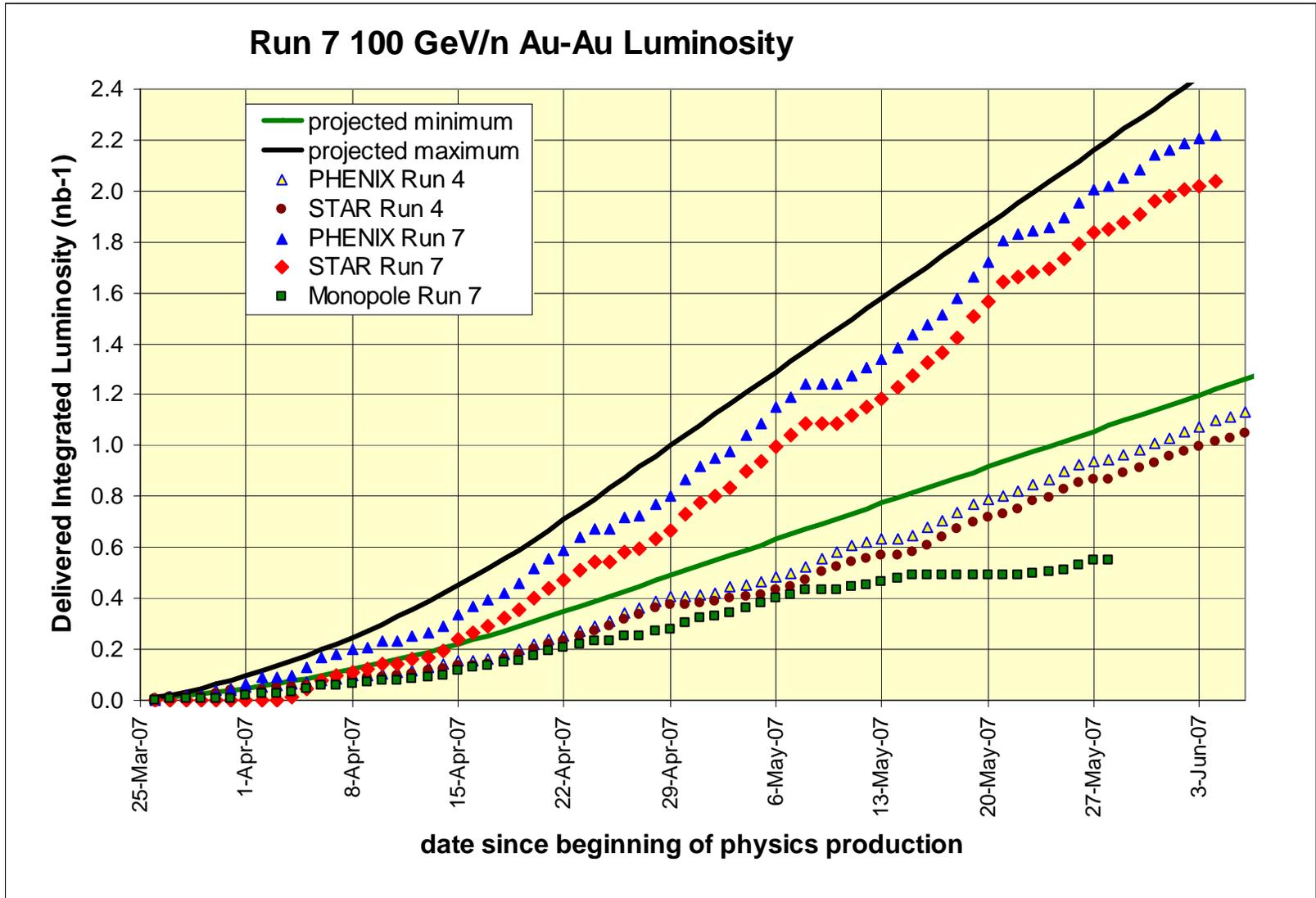


Run 7 100 x 100 GeV/n AuAu Delivered Luminosity per day averaged over past 1 week



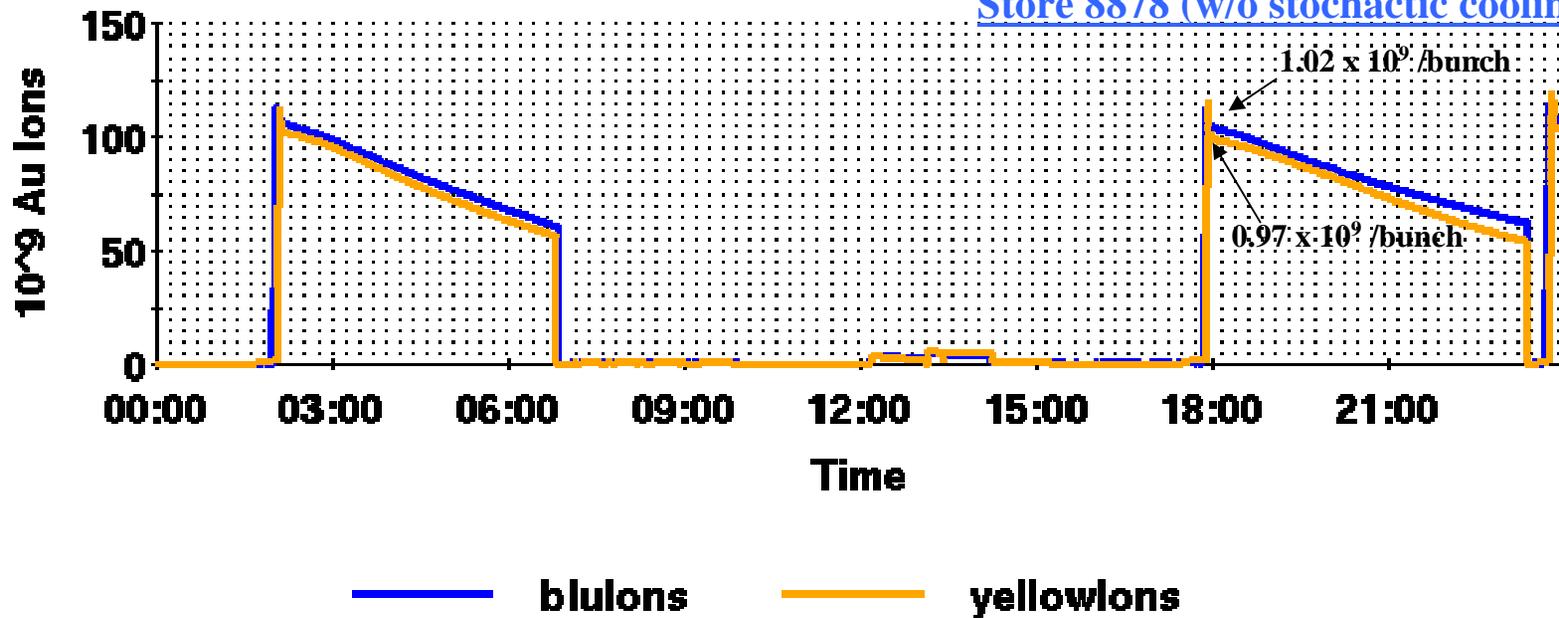




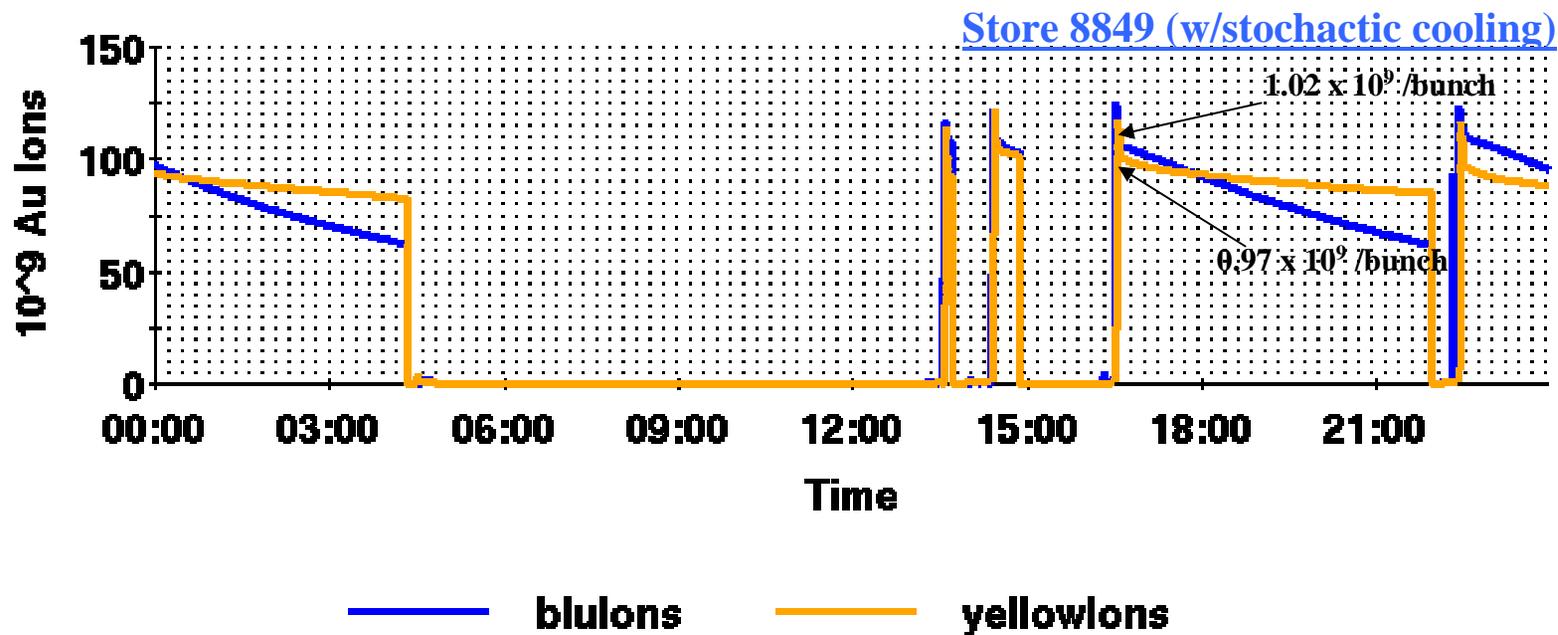


RHIC Beam Intensity Wed May 30 23:58:34 2007

Store 8878 (w/o stochastic cooling)

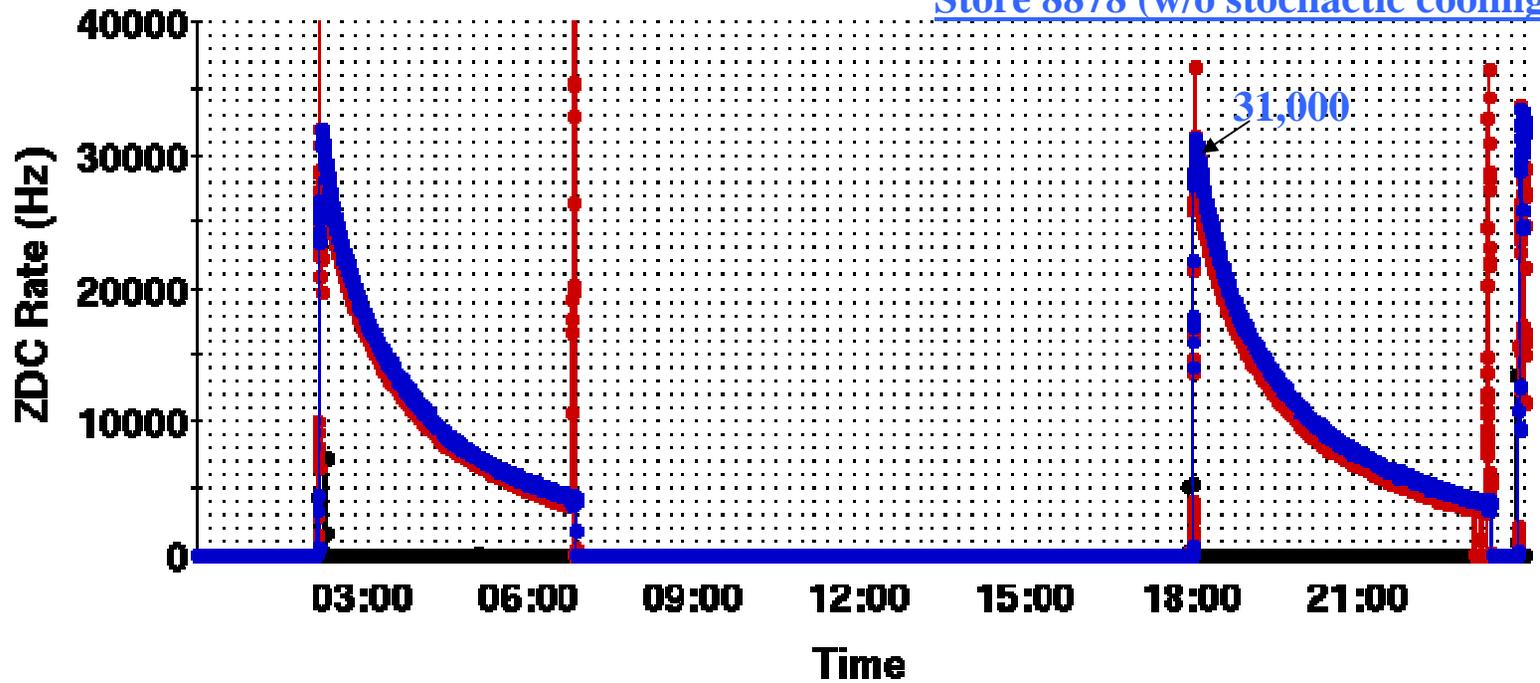


RHIC Beam Intensity Fri May 25 23:58:31 2007



RHIC Luminosity Wed May 30 23:58:47 2007

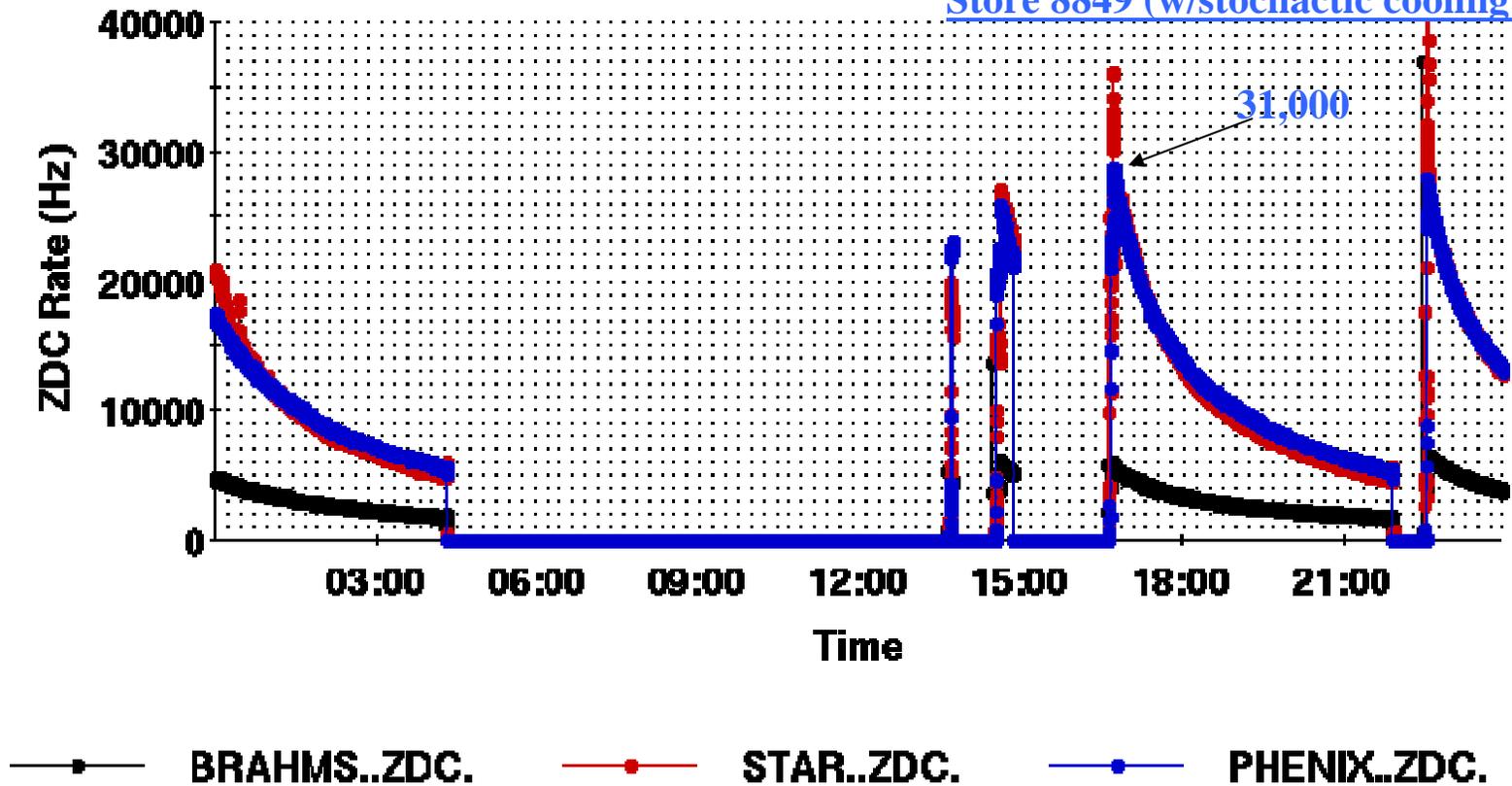
Store 8878 (w/o stochastic cooling)



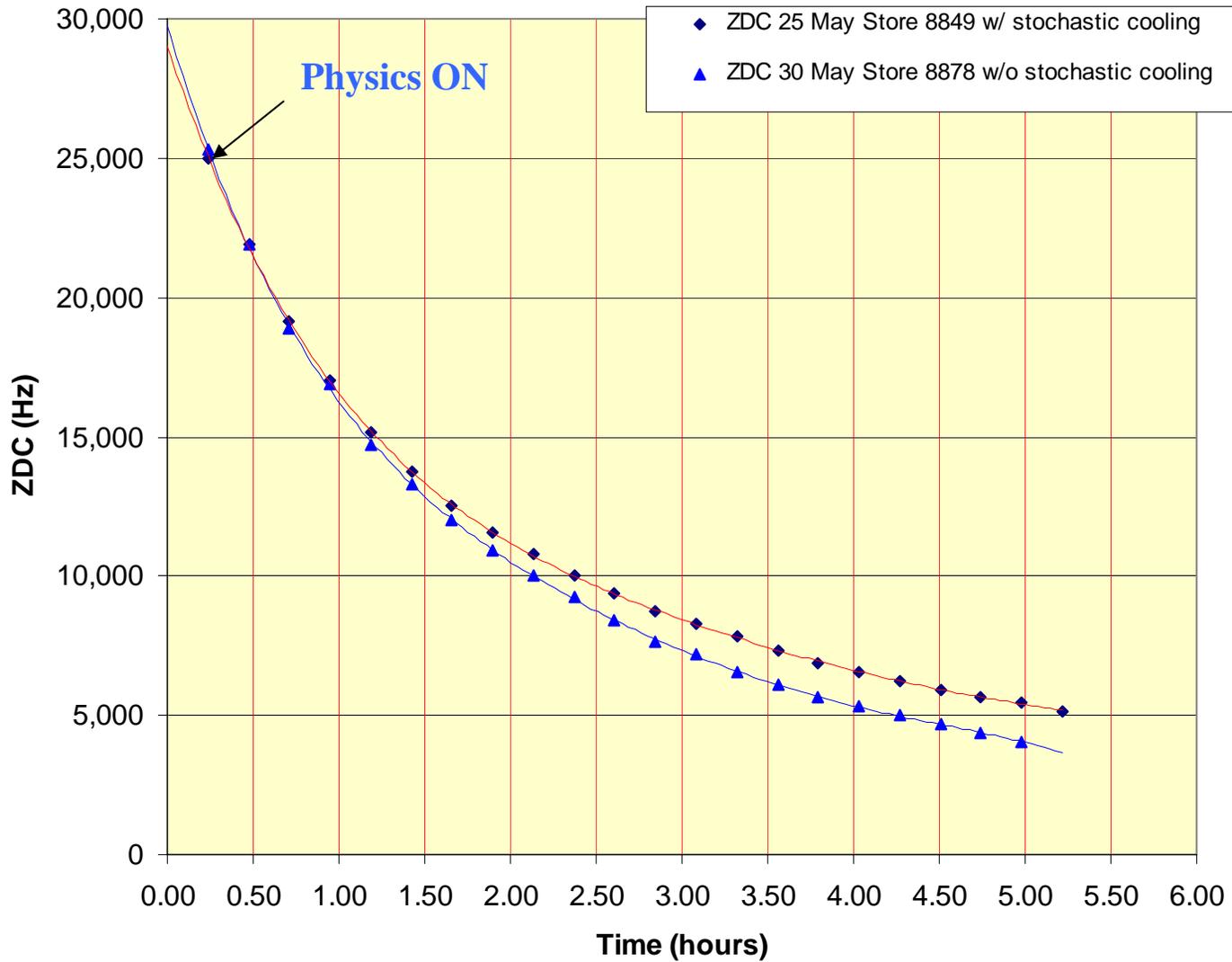
—●— BRAHMS..ZDC. —●— STAR..ZDC. —●— PHENIX..ZDC.

RHIC Luminosity Fri May 25 23:58:50 2007

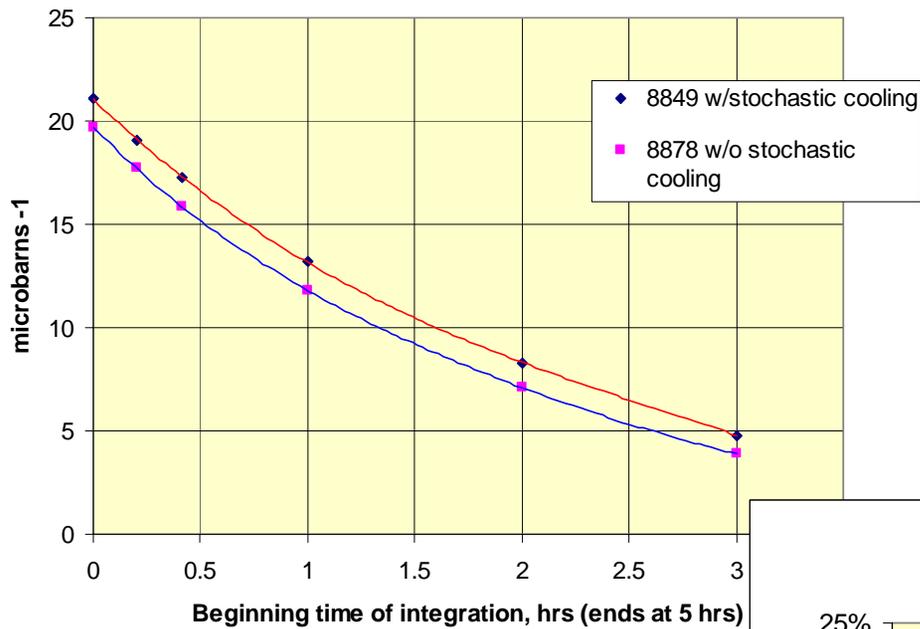
Store 8849 (w/stochastic cooling)



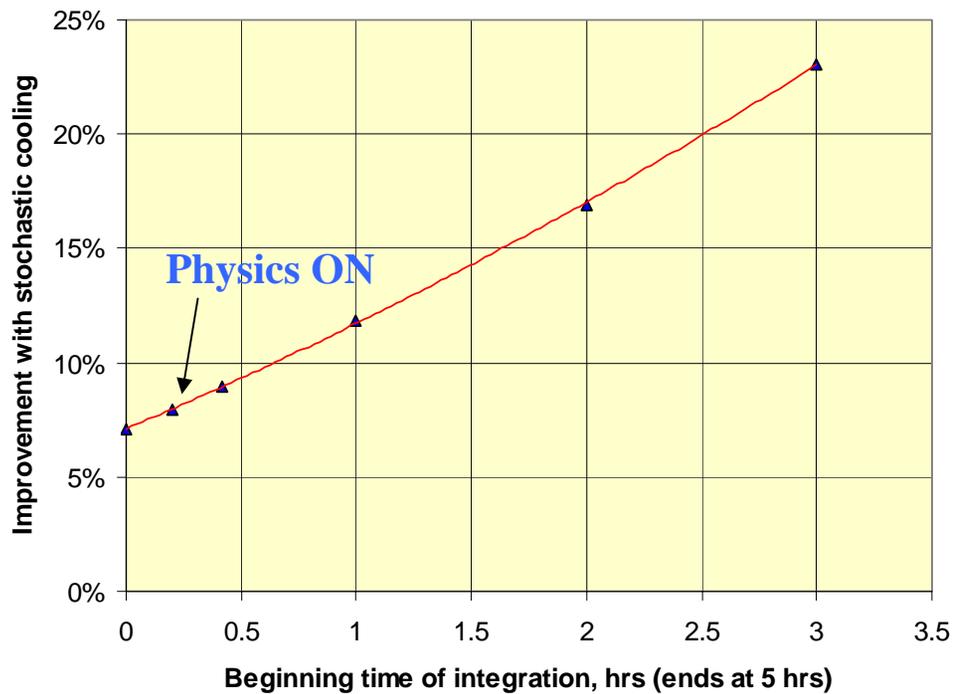
Run7 AuAu ZDC rates with and without stochastic cooling, with equal initial Au ions/bunch in each ring



Run 7 Stochastic Cooling



Run 7 Stochastic Cooling, stores 8849 and 8878



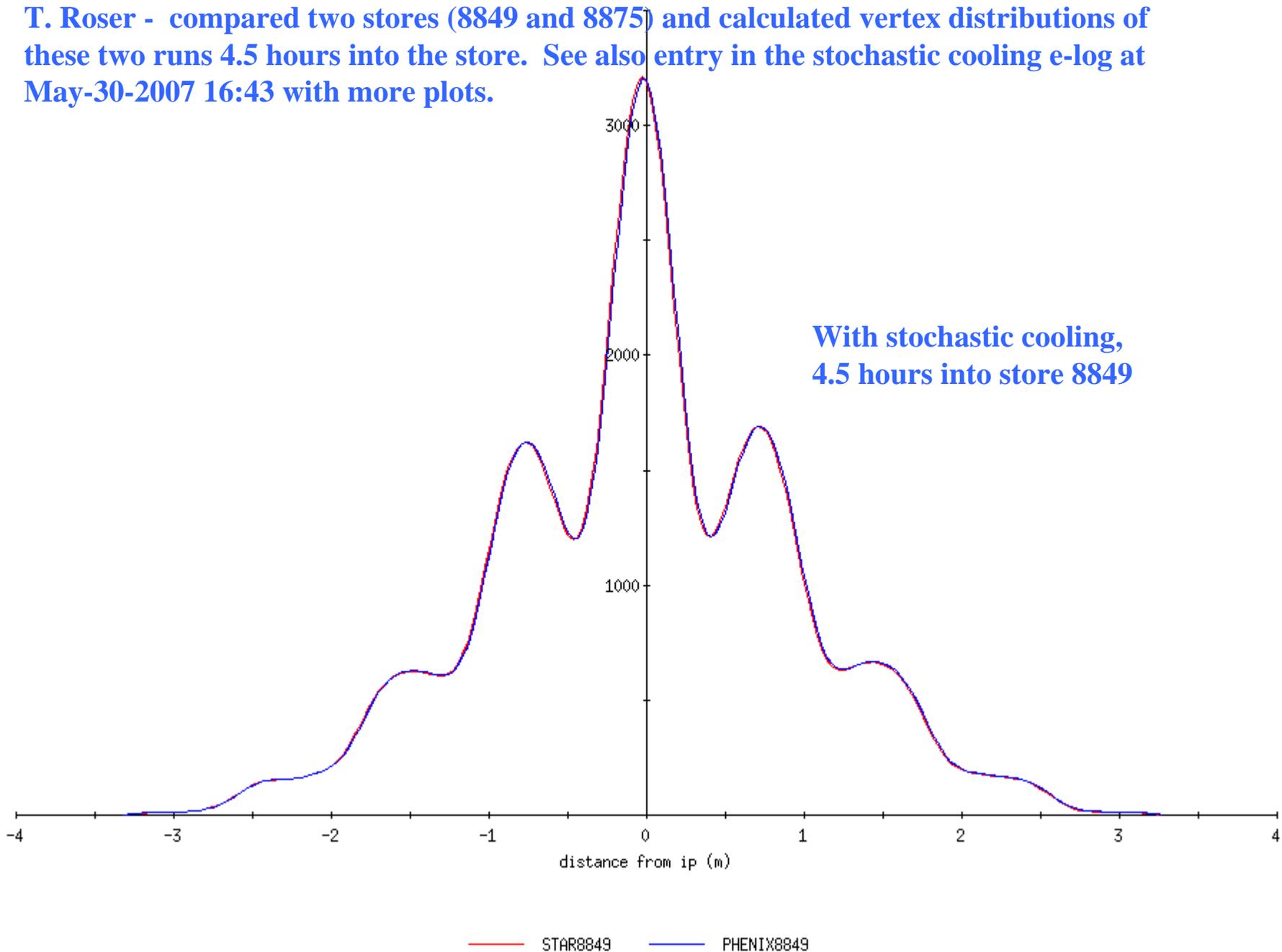
5 June 07

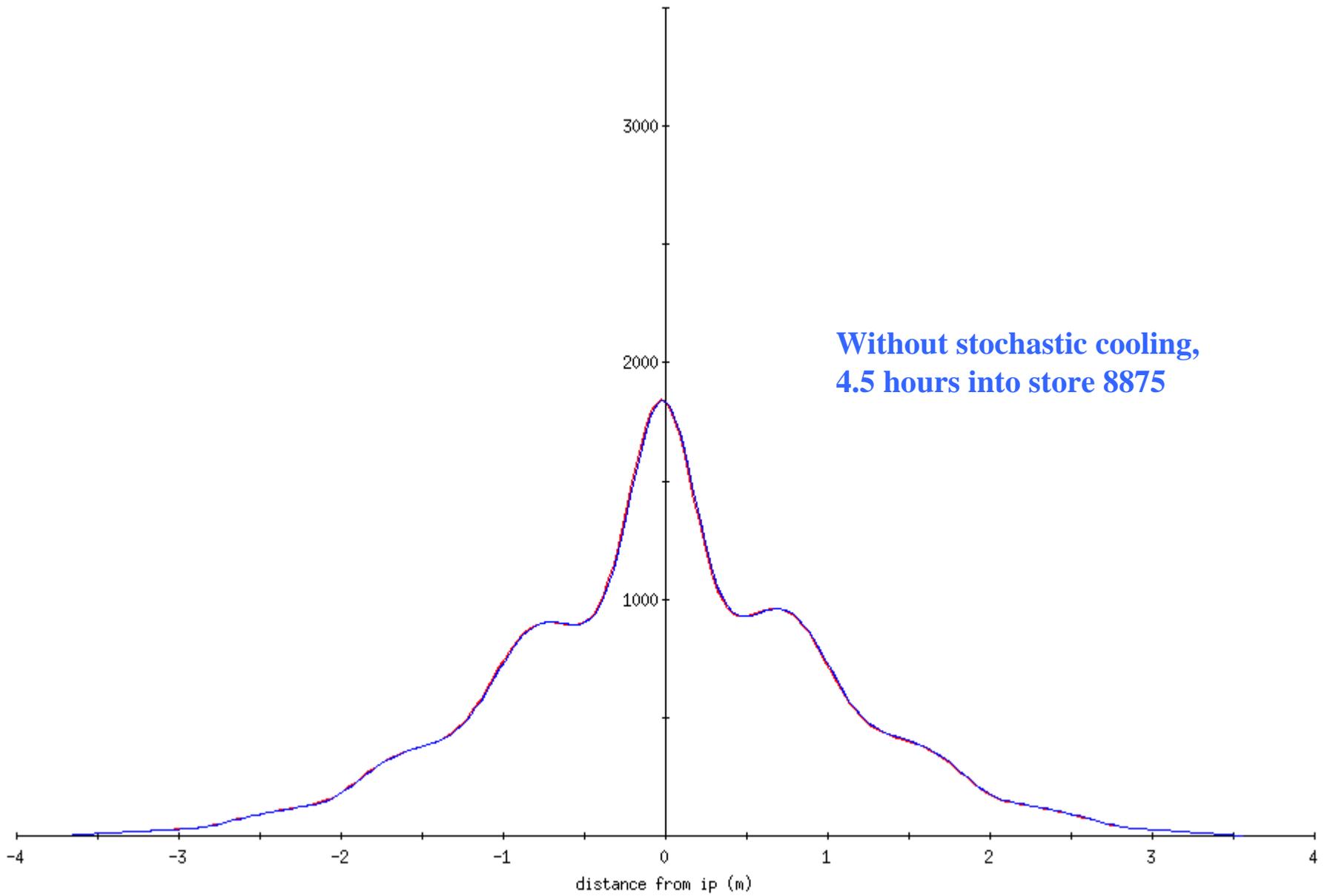
Last week revisited – calculation of improvement factor with correction for unequal initial beam intensities

Store	Au/bunch (10^9) T=+25 min	Store Hrs	μb^{-1}
8776	1.03/0.96	5.0	16.9
8805	1.09/1.02	5.0	20.6

Improvement = $20.6/16.9 * (1.03/1.09) * (0.96/1.02) = 1.08$

T. Roser - compared two stores (8849 and 8875) and calculated vertex distributions of these two runs 4.5 hours into the store. See also entry in the stochastic cooling e-log at May-30-2007 16:43 with more plots.

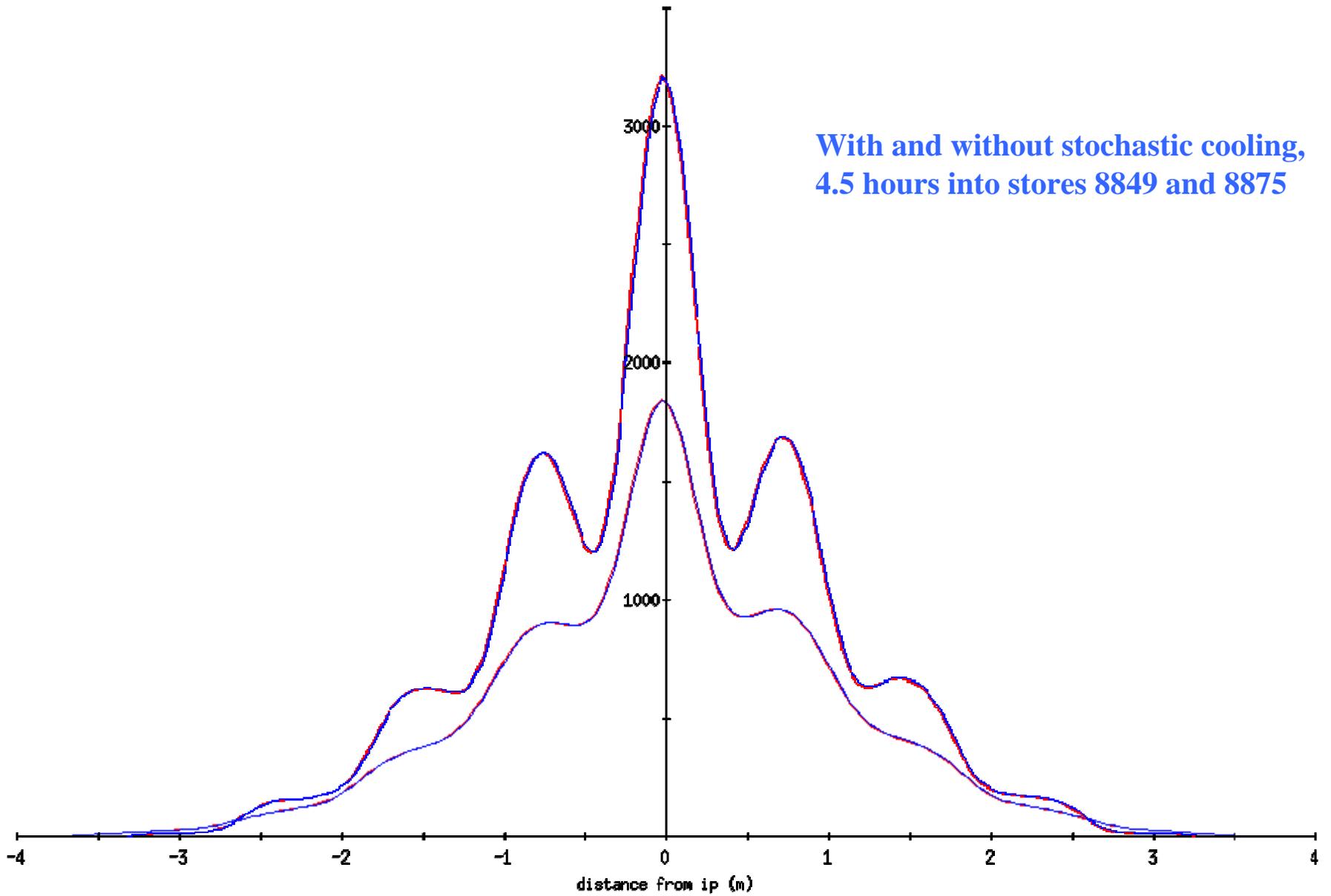




**Without stochastic cooling,
4.5 hours into store 8875**

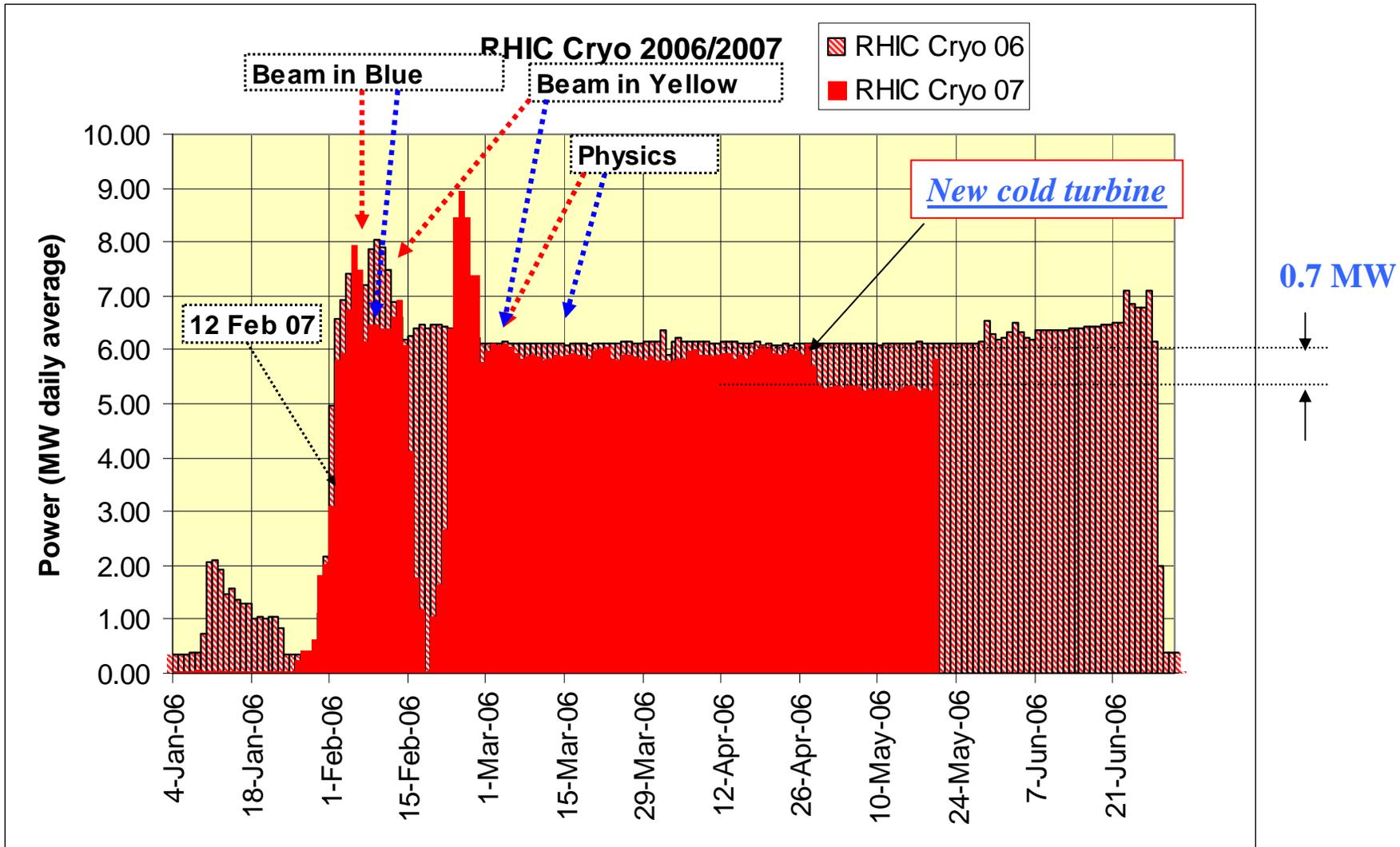
— STAR8875 — PHENIX8875

With and without stochastic cooling,
4.5 hours into stores 8849 and 8875

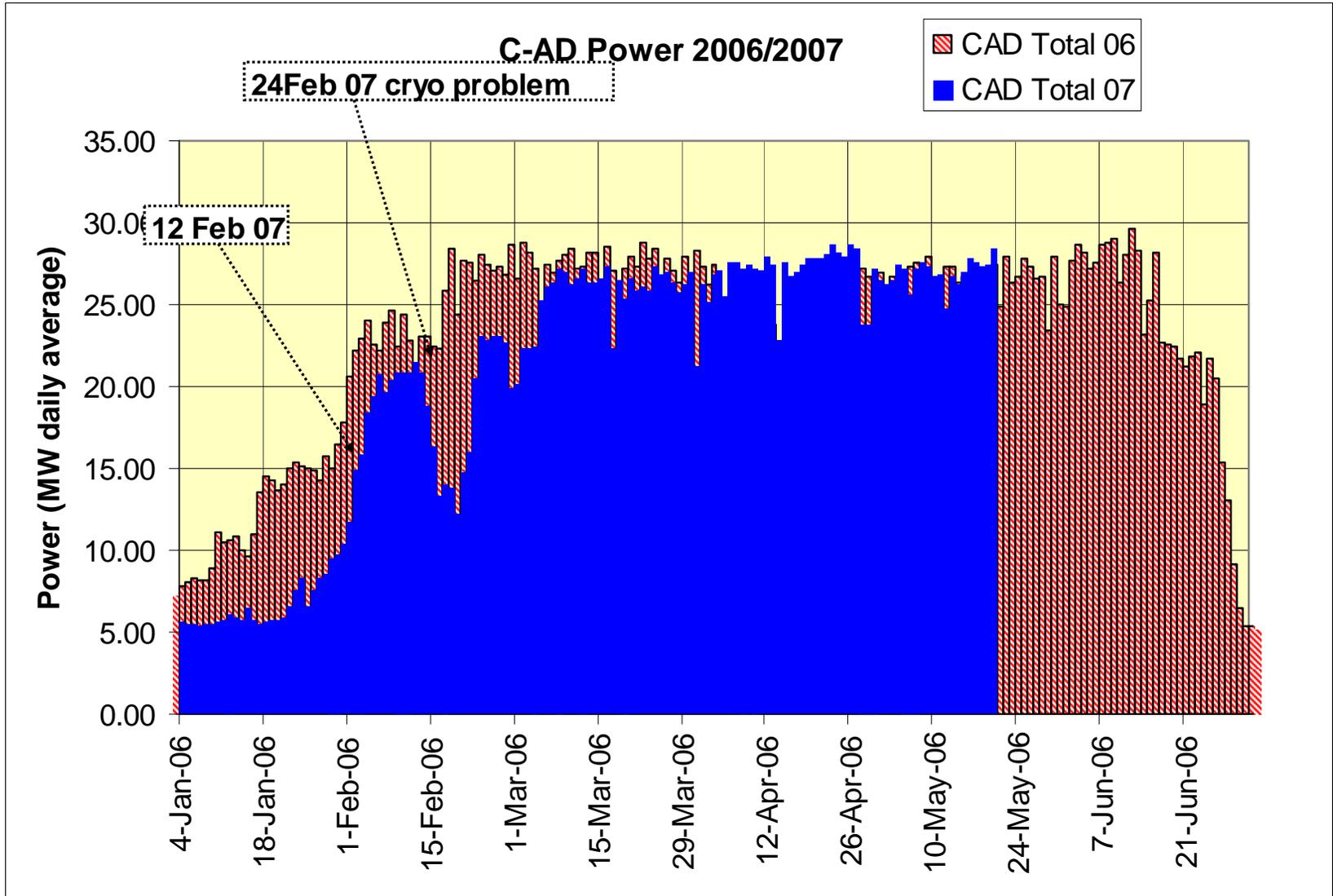


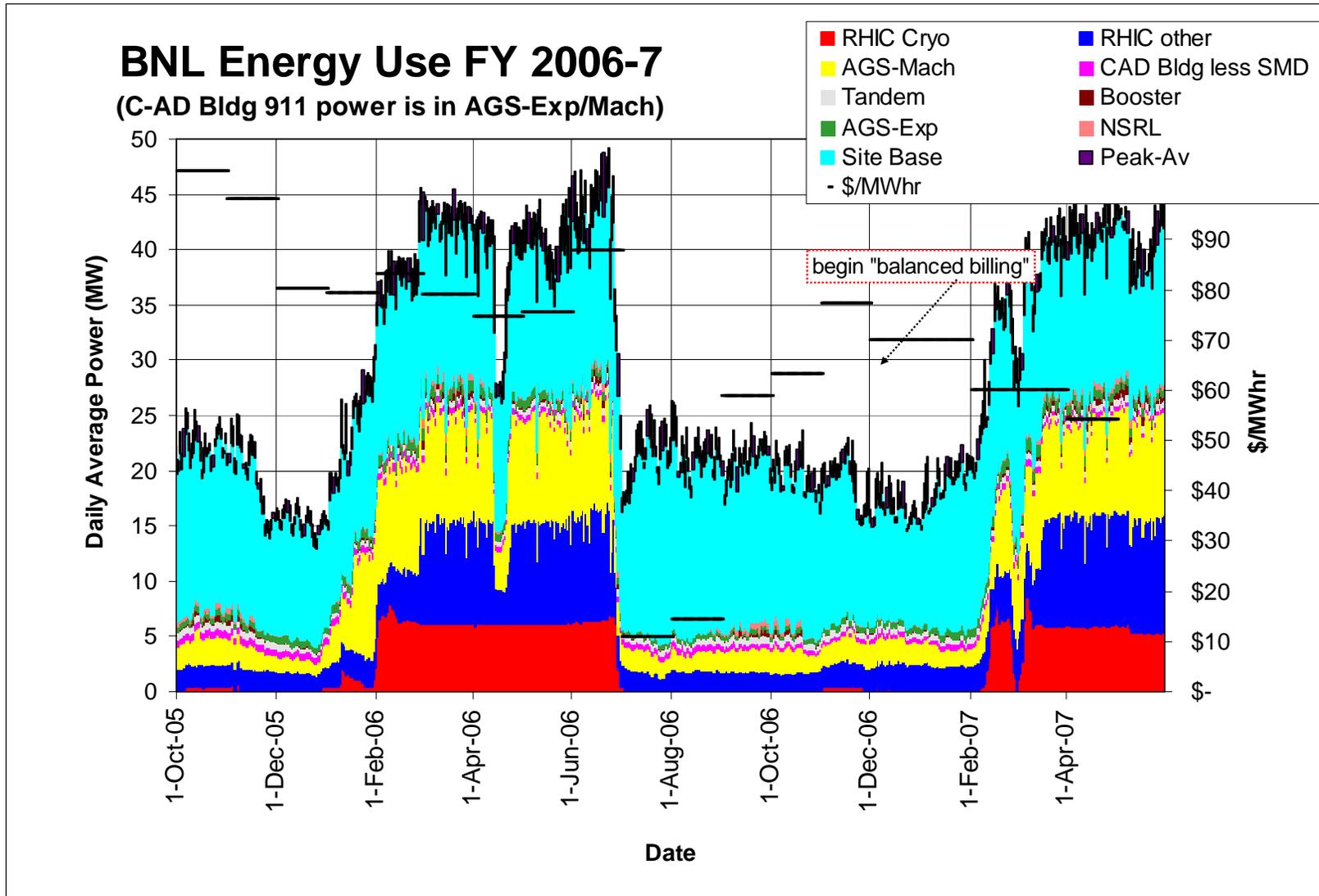
— STAR8849 — PHENIX8849

As of 31 May



As of 31 May





RHIC Machine/Detector Planning Meeting

Next Meeting

Tuesday, June 12, after Time Meeting

RHIC Machine/Detector Planning Meeting

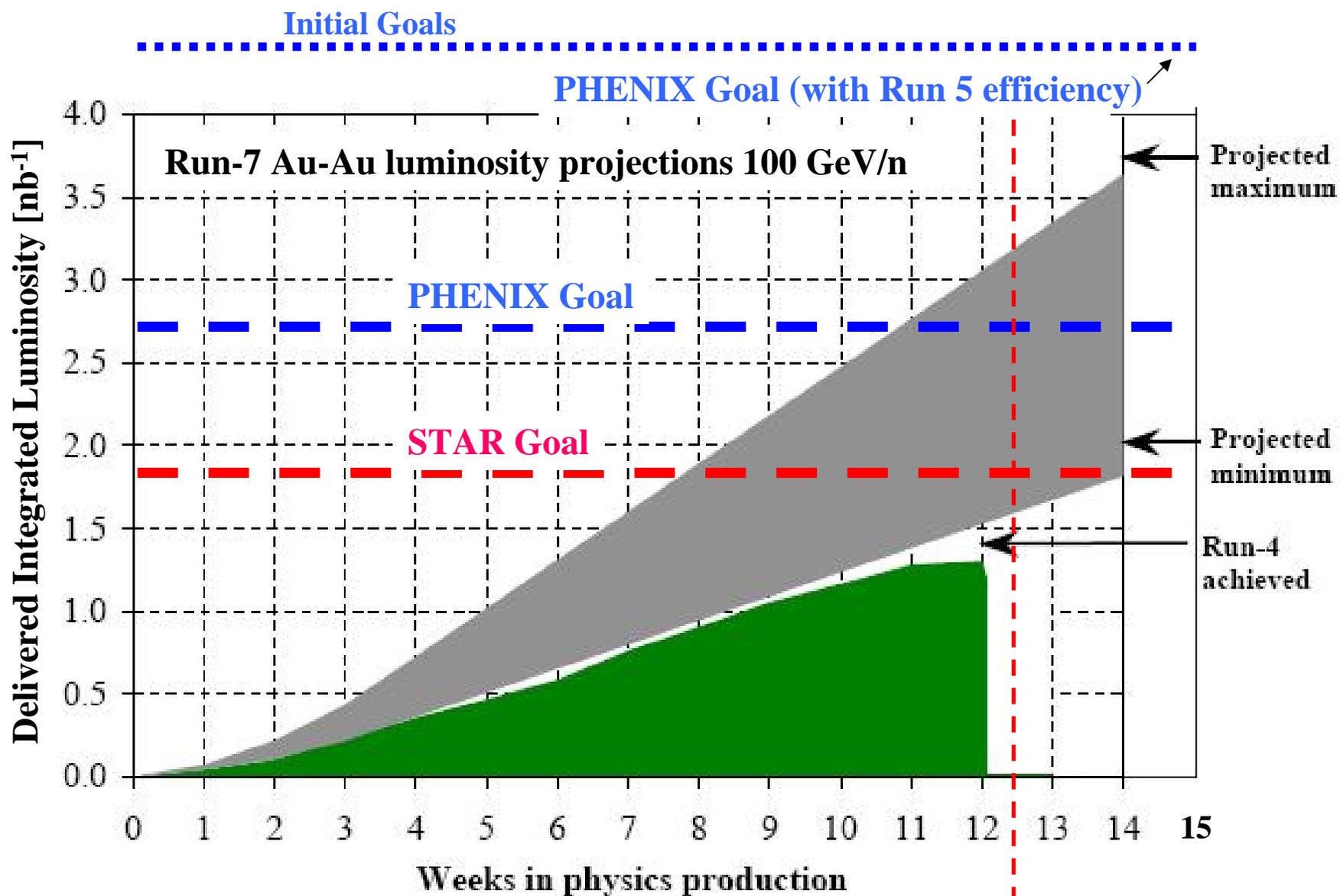
Archive

Revised 10 May

Experiments luminosity goals for the Au-Au run

- **PHENIX goals for 100 x 100 GeV/n Au-Au**
 - **Delivered Luminosity = 4000 μb^{-1} (was 2700)**
 - **Sampled Luminosity = 1100 μb^{-1}**
 - **Overall sampling efficiency = 28.9% (based on 4/29-5/5 stores)**

- **STAR goals for 100 x 100 GeV/n Au-Au**
 - **Delivered Luminosity = 2800 μb^{-1} (was 1800)**
 - **Rare Trigger Sampled Luminosity = 600 μb^{-1} (was 300)**
 - **Minimum Bias Triggers = 60M**
 - **Overall sampling efficiency for rare triggers = 24% (based on 5/3-5/8 stores)**



12.6 weeks with 26 June end of physics

C-A Operations-FY07

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

Plan, subject to change

FY 2007

Program Element	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
AGS-Booster-Tandem/Linac Startup														
								19.7 weeks						
RHIC Cryo Cooldown/Warm-up														
RHIC Cryo Operation														
RHIC Cryo off														
								13.1 weeks						
RHIC Research with $\sqrt{s} = 200$ GeV/n Au - Au														
RHIC Other (TBD)														
NSRL (NASA Radiobiology)														
Shutdown (RHIC)														

26 June

RHIC Machine/Detector Planning Meeting

Answer to Questions from the 6 Feb meeting

- (1) **Experiments – What are your luminosity goals for the Au-Au run, Delivered and Sampled?**
- **PHENIX goals for 100 x 100 GeV/n Au-Au**
 - **Delivered Luminosity = 2700 μb^{-1}**
 - **Sampled Luminosity = 1100 μb^{-1}**
 - **Assumes 68% live time, 60% vertex cut = 40.5% efficient**
 - **However, Run5 efficiency factor was 25% (if so, the Run7 requirement is 4400 μb^{-1} delivered)**

 - **STAR goals for 100 x 100 GeV/n Au-Au**
 - **Delivered Luminosity = 1800 μb^{-1}**
 - **Sampled Luminosity = 300 μb^{-1} with 60M usable min-bias events**
 - **~50% live time**

RHIC Machine/Detector Planning Meeting

Answer to Questions from the 6 Feb meeting (to be revisited)

(2) Experiments and Machine - If the Au-Au run goes well and luminosity goals are met with a week or two left to go, what should we do?

– **PHENIX**

- **Probably need 15 weeks to achieve Au-Au goals – highest priority**
- **pp development if well motivated/justified**
 - **Studies to maximize Run8 figure of merit**
 - **500 GeV development**

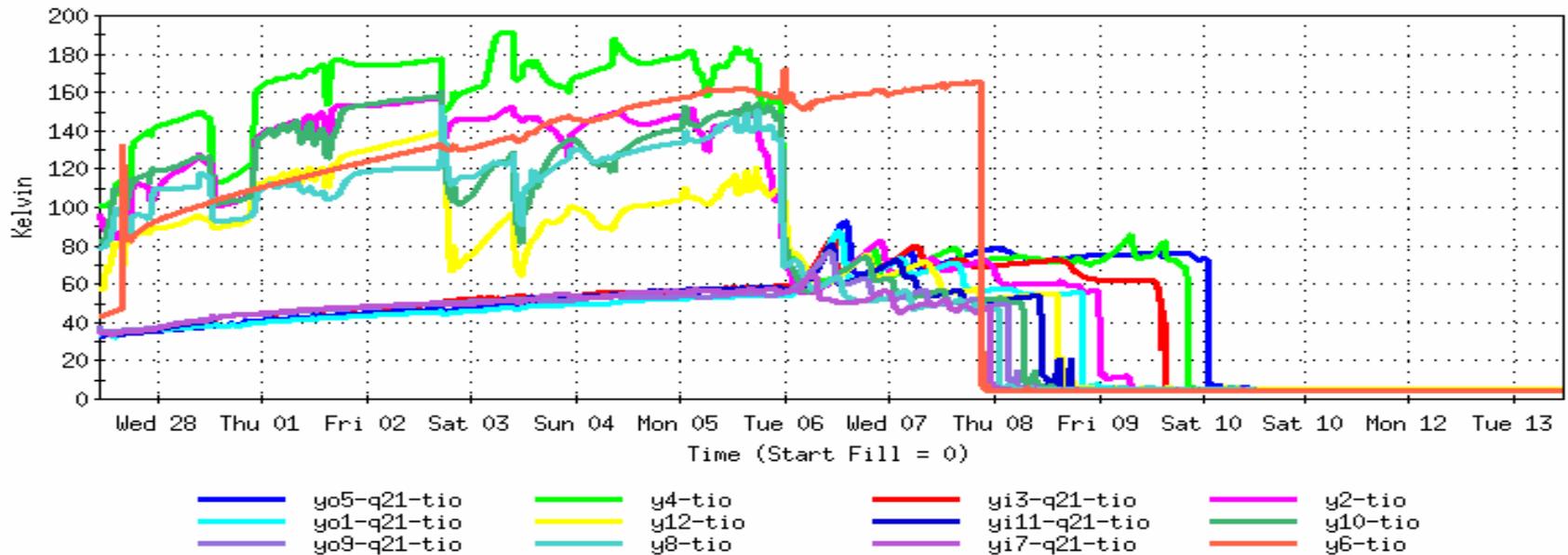
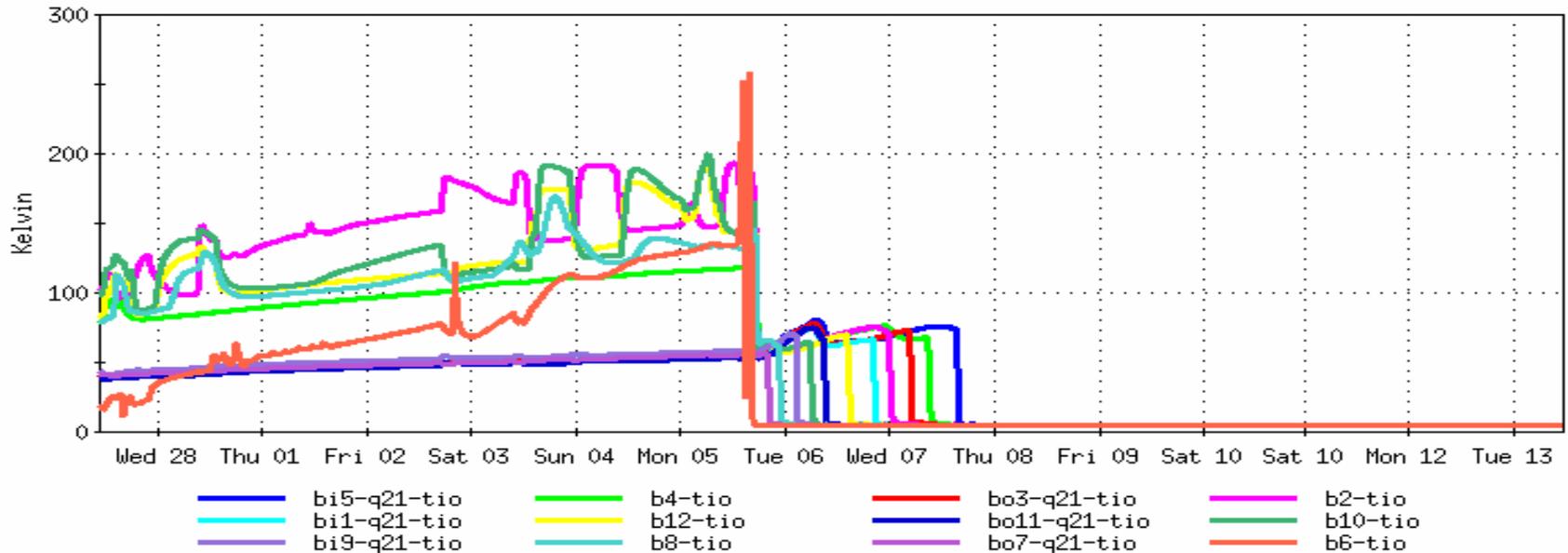
– **STAR**

- **Low energy Au-Au development, collider issues, triggering...**

– **Machine**

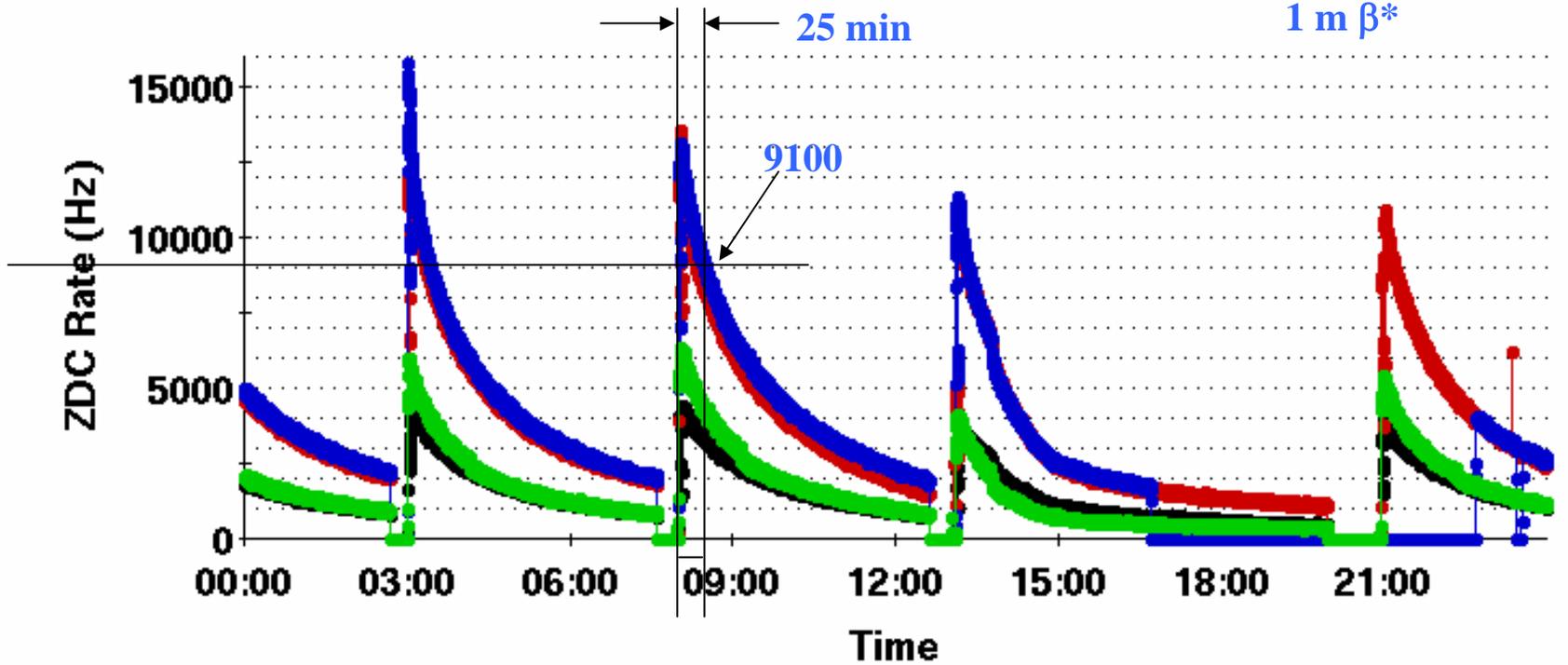
- **1-2 days low energy Au-Au development at 0.5 injection energy**
- **pp development –**
 - **1st priority new RHIC working point (needs ~2 weeks)**
 - **2nd priority 500 GeV development**

As of 12 Mar



RHIC Luminosity Sun Mar 21 23:59:57 2004

45 x 45 bunches
1 m β^*



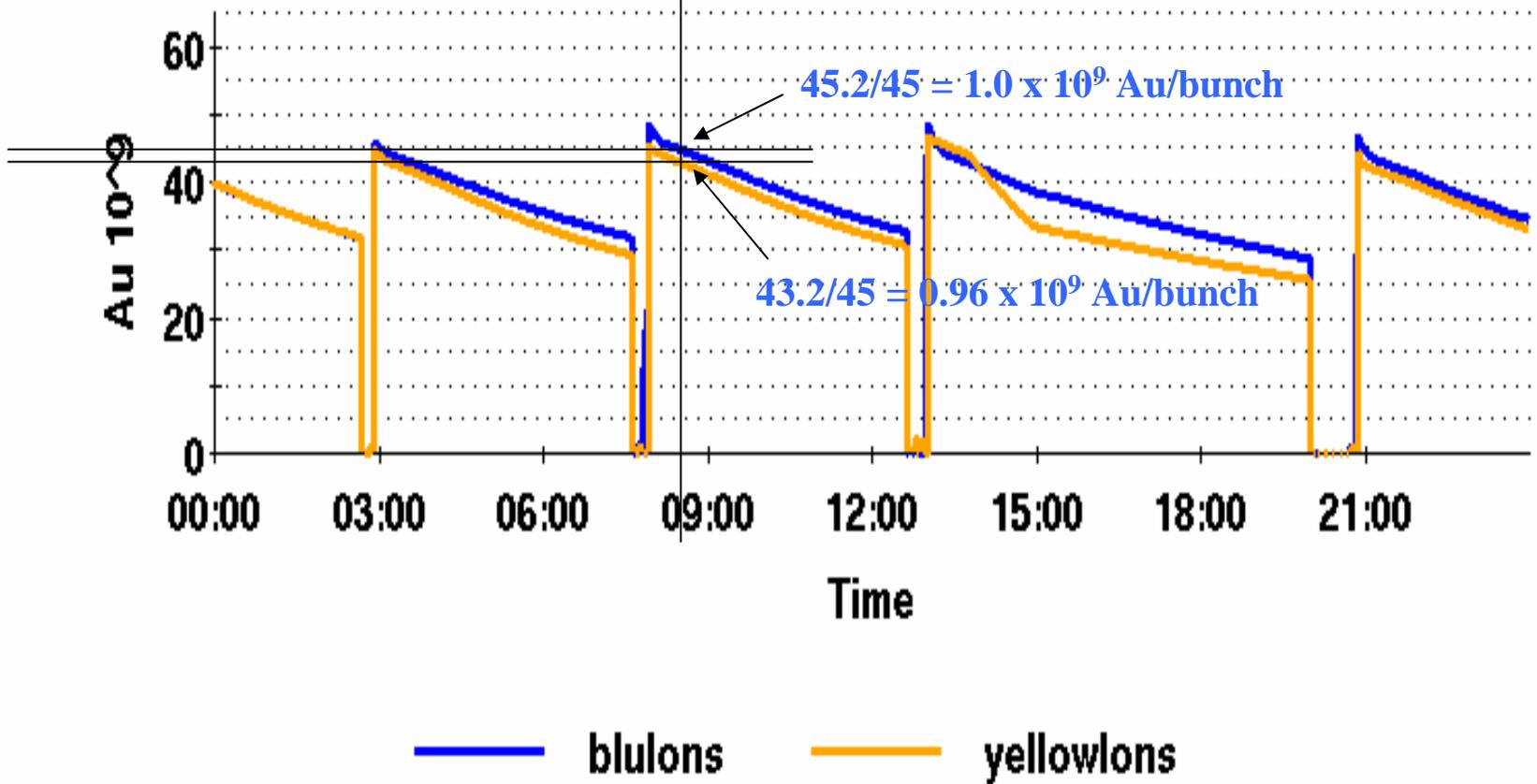
—●— BRAHMS..ZDC.
—●— PHENIX..ZDC.

—●— STAR..ZDC.
—●— PHOBOS..ZDC.

RHIC Beam Intensity Sun Mar 21 23:58:58 2004

45 x 45 bunches

25 min into store



For discussion

5/15/07

(revisited – parameters taken ~ 25 minutes into the store)

	<u>Run4 (21 Mar 04)</u>	<u>Run7 (15 May 07)</u>
ZDC (initial Hz)	9,100	23,800
N_{Au}(10⁹)	45/43	106/97.5
N_{Au} Bunches	45	103
Au/Bunch (10⁹)	1.0/0.96	1.03/0.95
β* (m)	1.0	0.8

If the beam emittance is the same for the two runs then:

$$\beta^* \text{ for Run 7} = 1.0 (\beta^* \text{ for Run4}) * 9,100/23,800(\text{ZDC's}) * 103/45 (\text{Nbunches}) \\ * (1.03/1)*(0.95/0.96)(\text{bunch intensity}) = 0.89 \text{ meters}$$

Run 7 β* is supposed to be 0.8 meters