

# Run 13 RHIC Machine/Experiments Meeting

16 April 2013

## Agenda:

- Status Reports
- Progress report on FGT commissioning (Berndt Surrow)

# Run 13 plan based on 20 weeks cryo operation

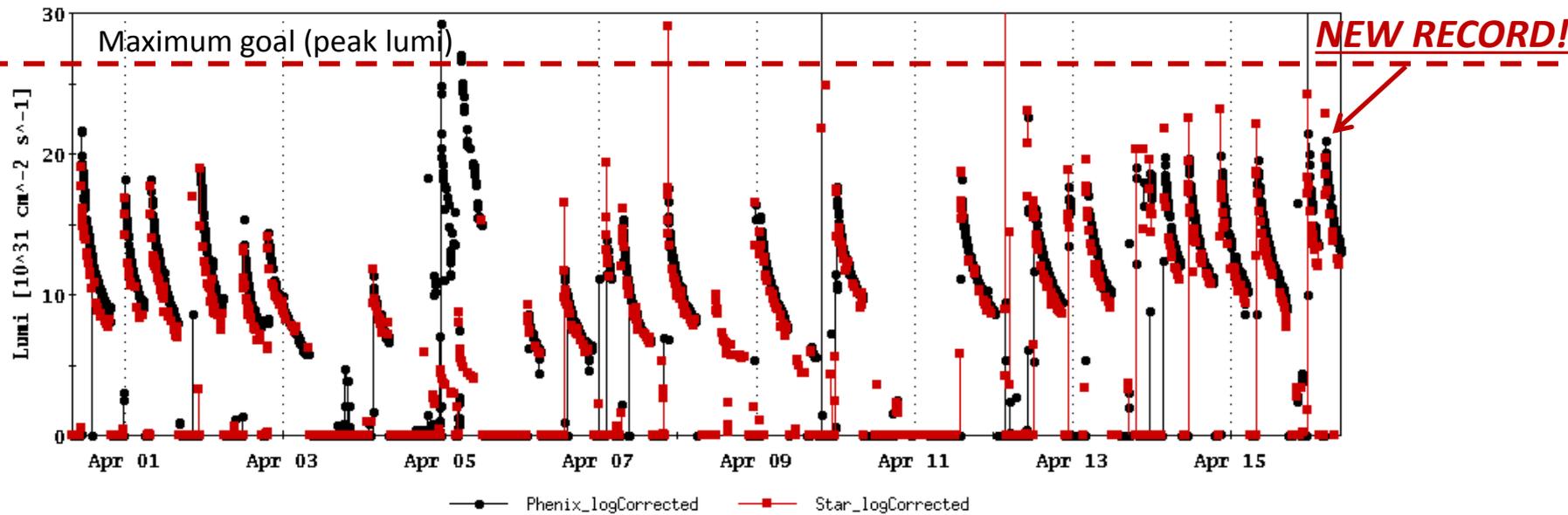
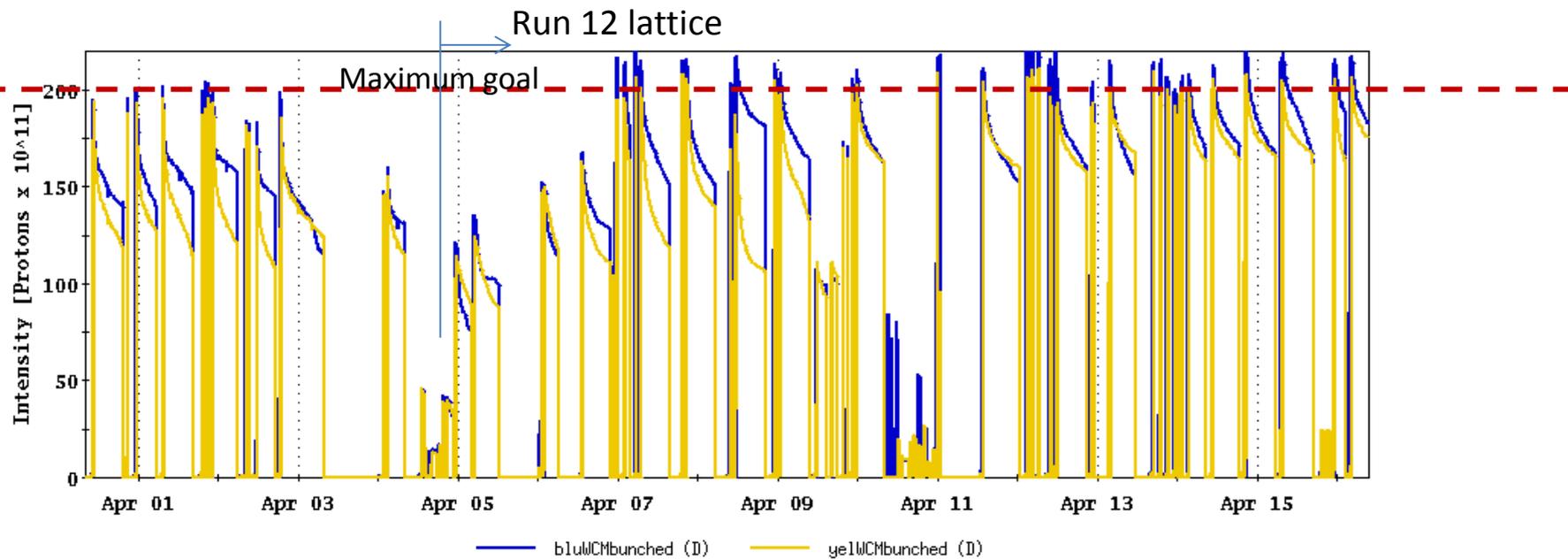
and Fischer et.al. RHIC Collider Projections (FY 2013 – FY 2017), 27 Sep 2012

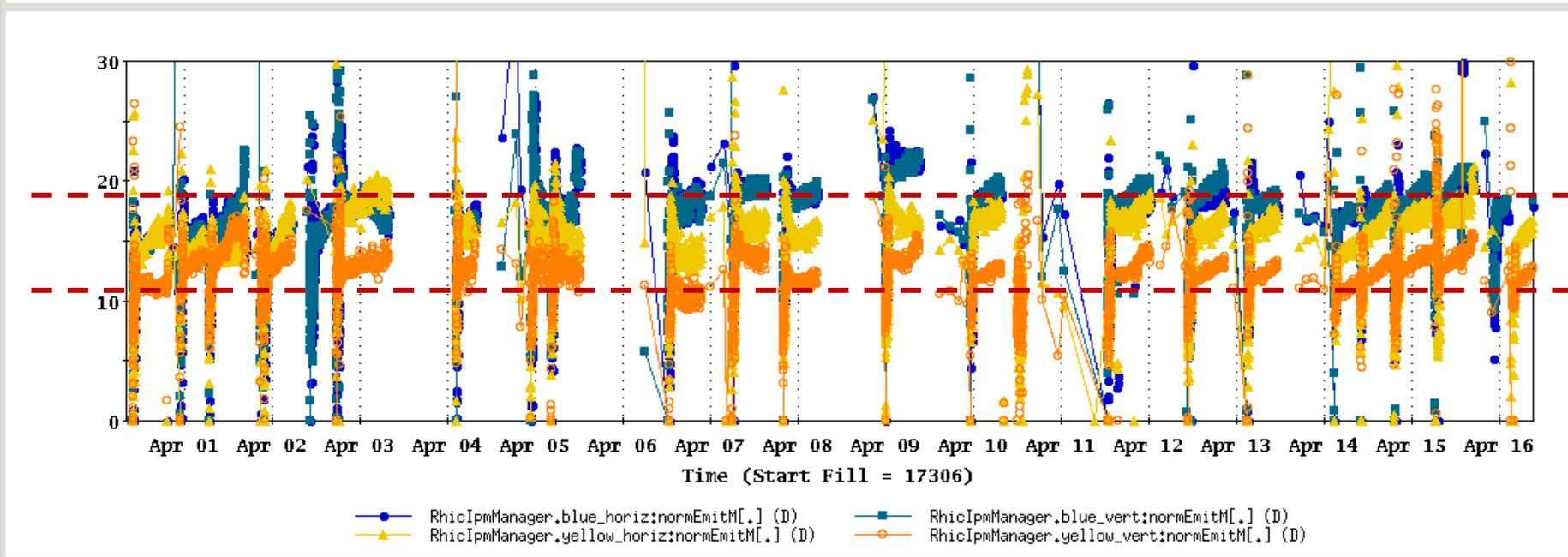
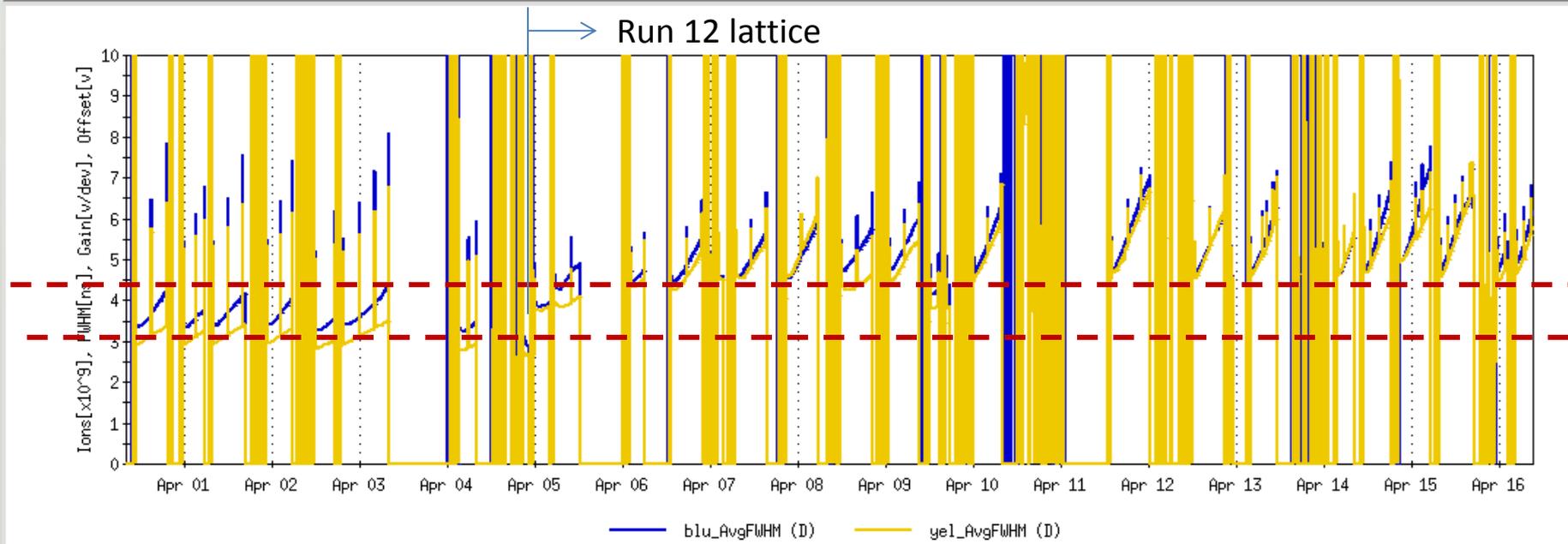
- ✓ 11 Feb, Begin cool-down to 4.5K
- ✓ 15 Feb, Cool-down to 4.5K in Blue and Yellow Ring complete, begin magnet setup
- ✓ 26 Feb, first collisions
- ✓ 15 Feb -1 Mar, RHIC  $\sqrt{s} = 510$  GeV pp machine setup
- ✓ 1-8 Mar, machine ramp-up with 8 hr/night for experiment setup
- ✓ 9 Mar (store 17201), begin  $\sqrt{s} = 510$  GeV pp physics run

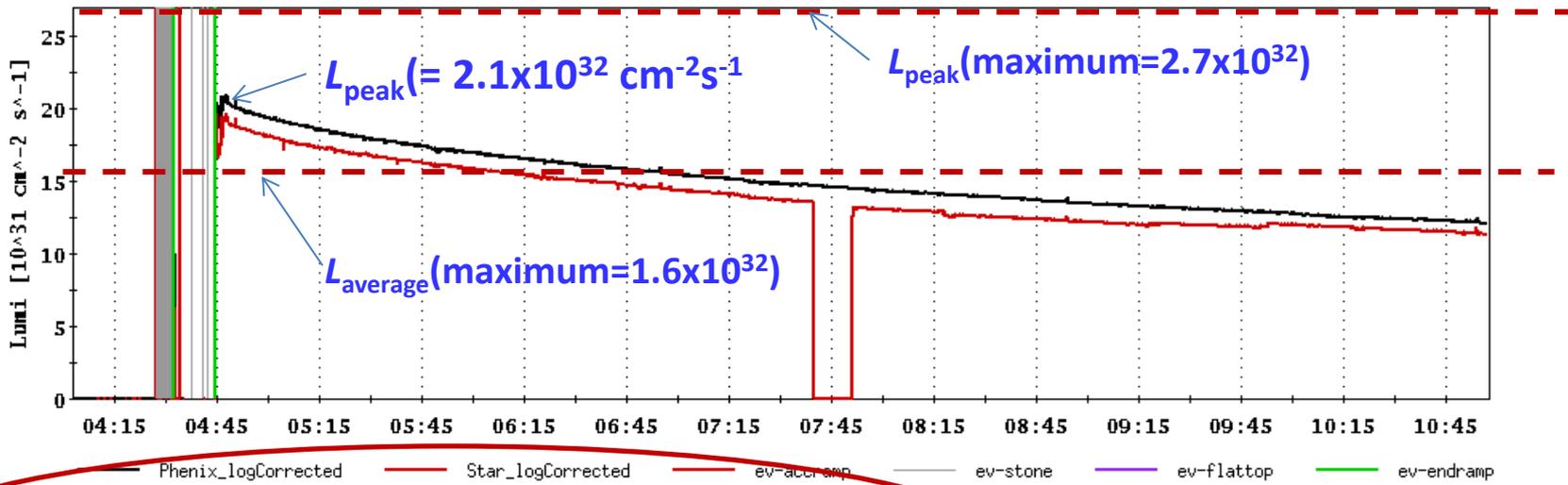
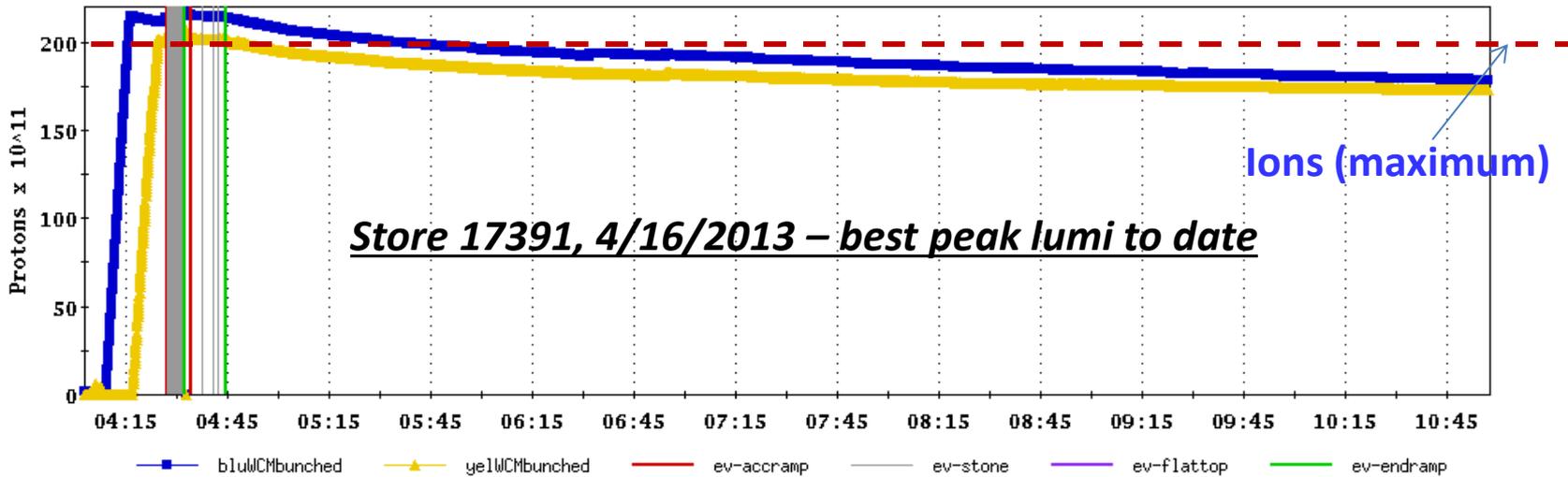
## today, 16 Apr...

- 27 May, end 15 cryo weeks
- 6 Jun, switch to  $\sqrt{s} = 15$  GeV/n AuAu if pp goals are met and end 12.7 week  $\sqrt{s} = 510$  GeV pp physics run
- 27 Jun, end  $\sim 2.5$  week  $\sqrt{s} = 15$  GeV/n AuAu physics run or 15.9 week  $\sqrt{s} = 510$  GeV pp physics run, begin cryo warm-up
- 30 June, cryo warm-up  $\sim$ complete (19.9 cryo-weeks)

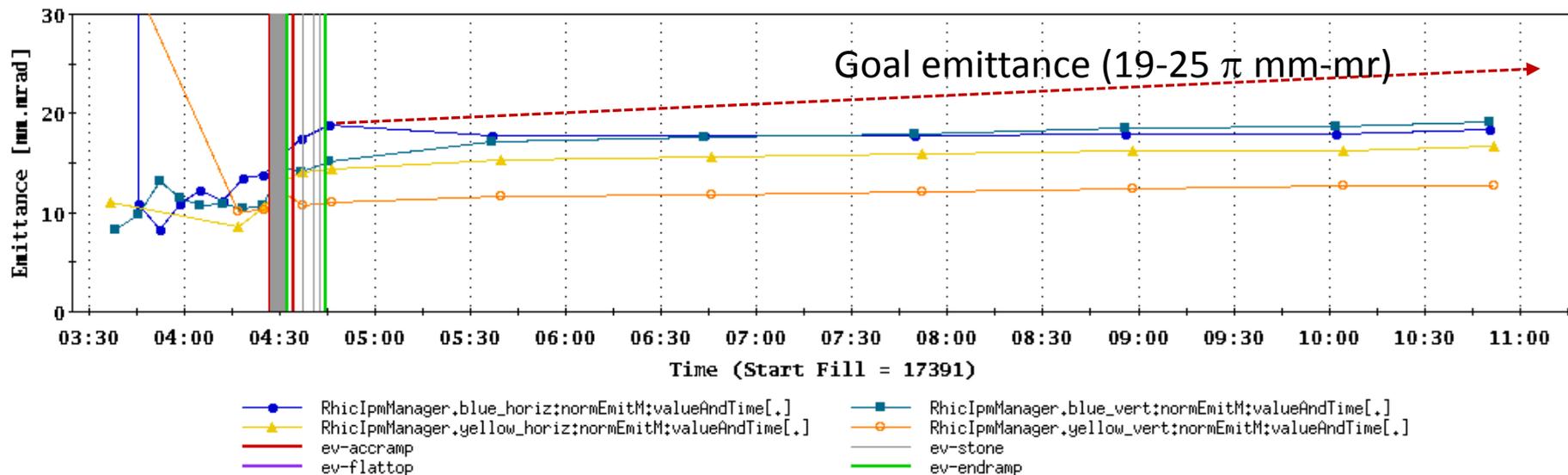
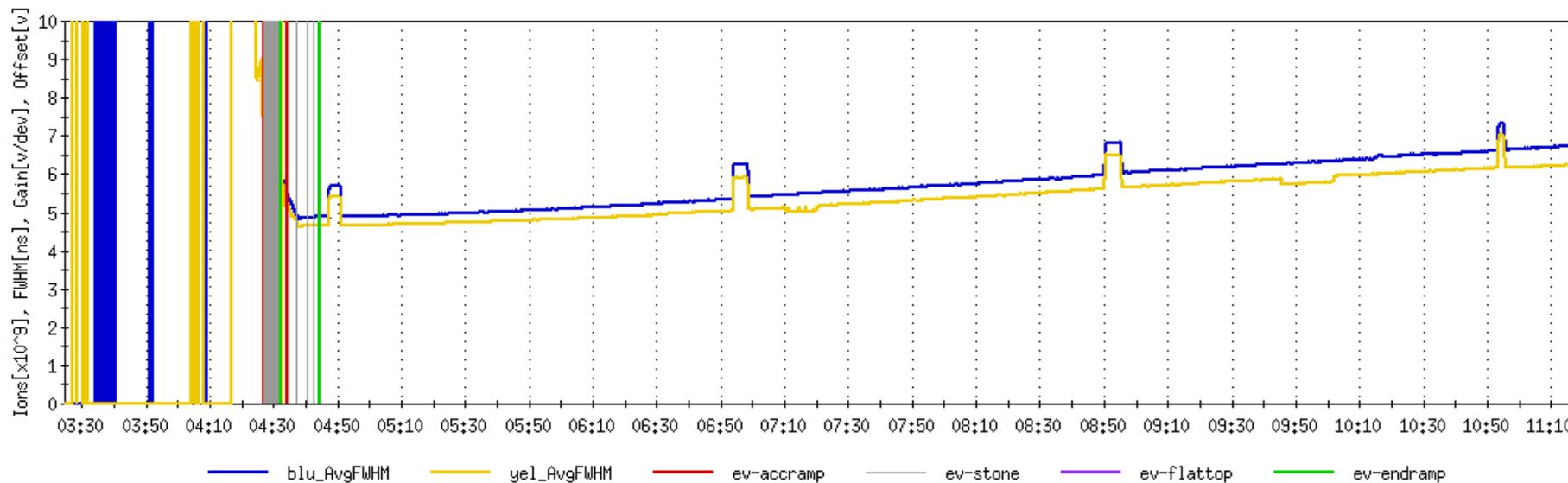
See <http://www.rhichome.bnl.gov/AP/Spin2013/> for the Run Coordinator's detailed plan



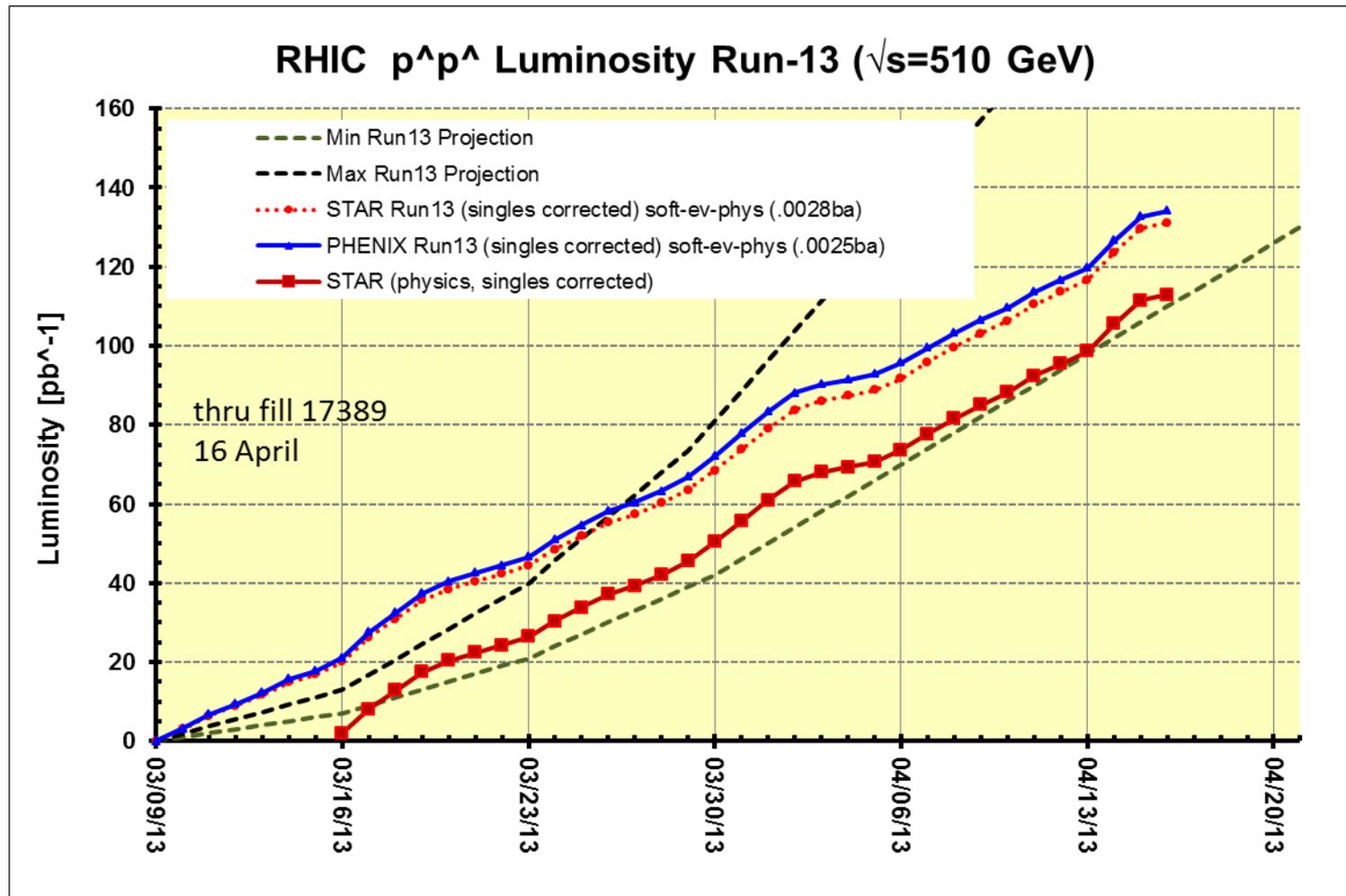




Time = Tue Apr 16 04:47:24 2013+0ms, bluWCMbunched = 212.643  
 Time = Tue Apr 16 04:47:32 2013+0ms, yelWCMbunched = 200.528  
 Time = Tue Apr 16 04:46:59 2013+5ms, Phenix\_logCorrected = 20.7117



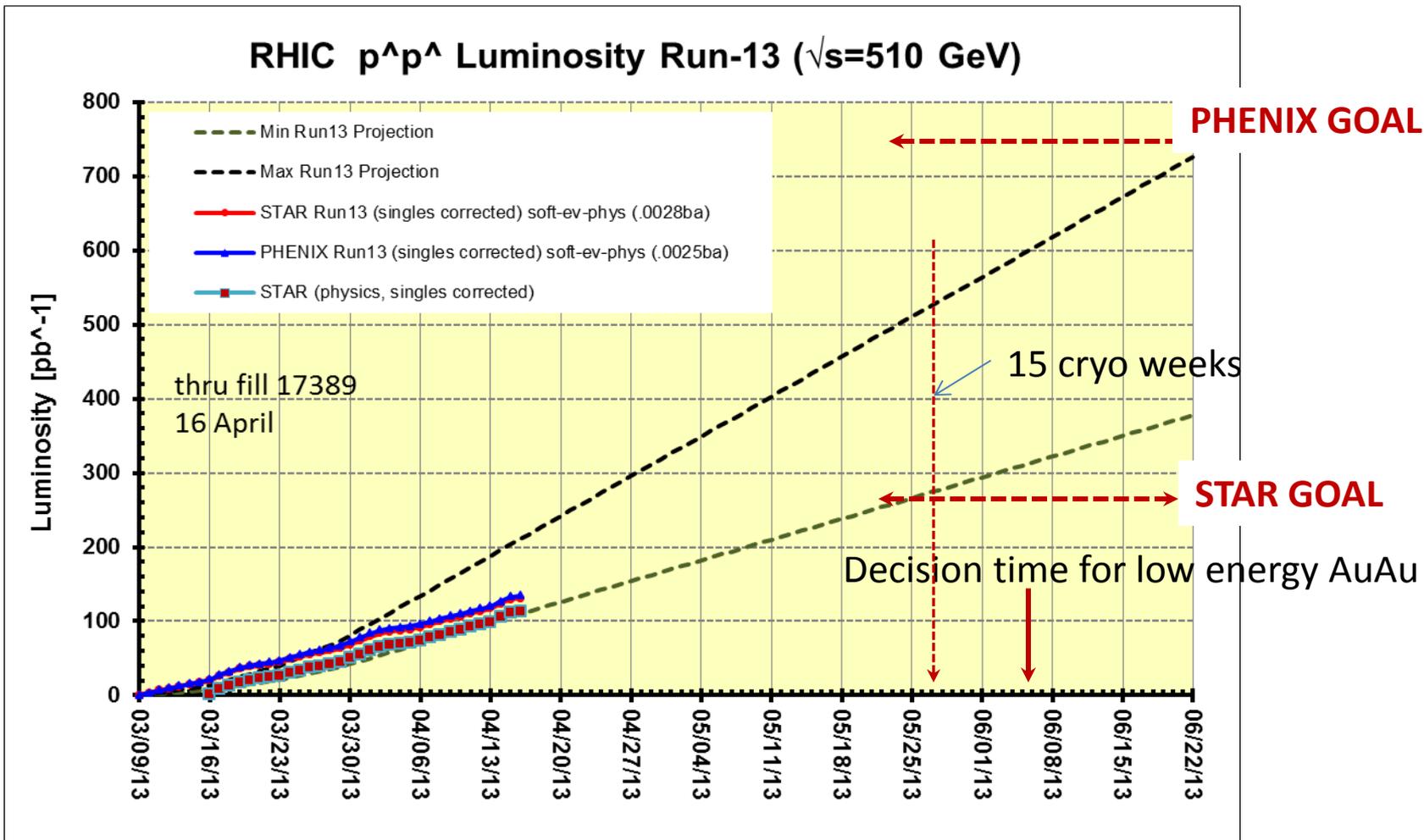
**Preliminary**, with Run 13 cross sections, PHENIX and STAR **log based singles correction**



**Preliminary**, with Run 13 cross sections, PHENIX and STAR **log based singles correction**

PHENIX Goal, 250 pb<sup>-1</sup> recorded, 750 pb<sup>-1</sup> delivered, ≥ 55% polarization

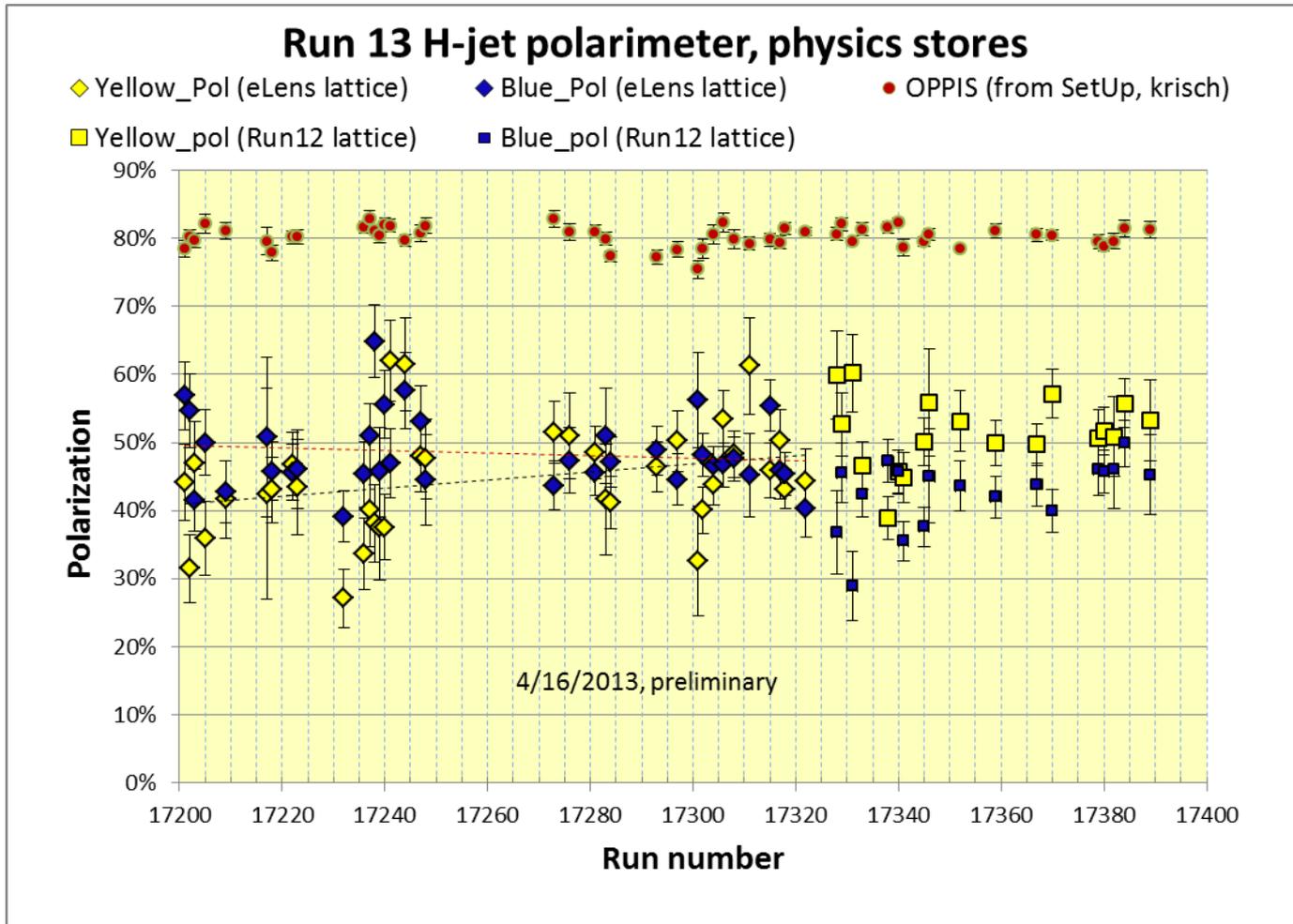
STAR Goal, 165 pb<sup>-1</sup> recorded, 275 pb<sup>-1</sup> delivered, ≥ 55% polarization



Preliminary, with Run 13 cross sections, singles corrected

Yellow average =  $44.3 \pm 0.8\%$   
Blue average =  $47.7 \pm 0.7\%$   
stores 17201-17322 (eLens lattice)

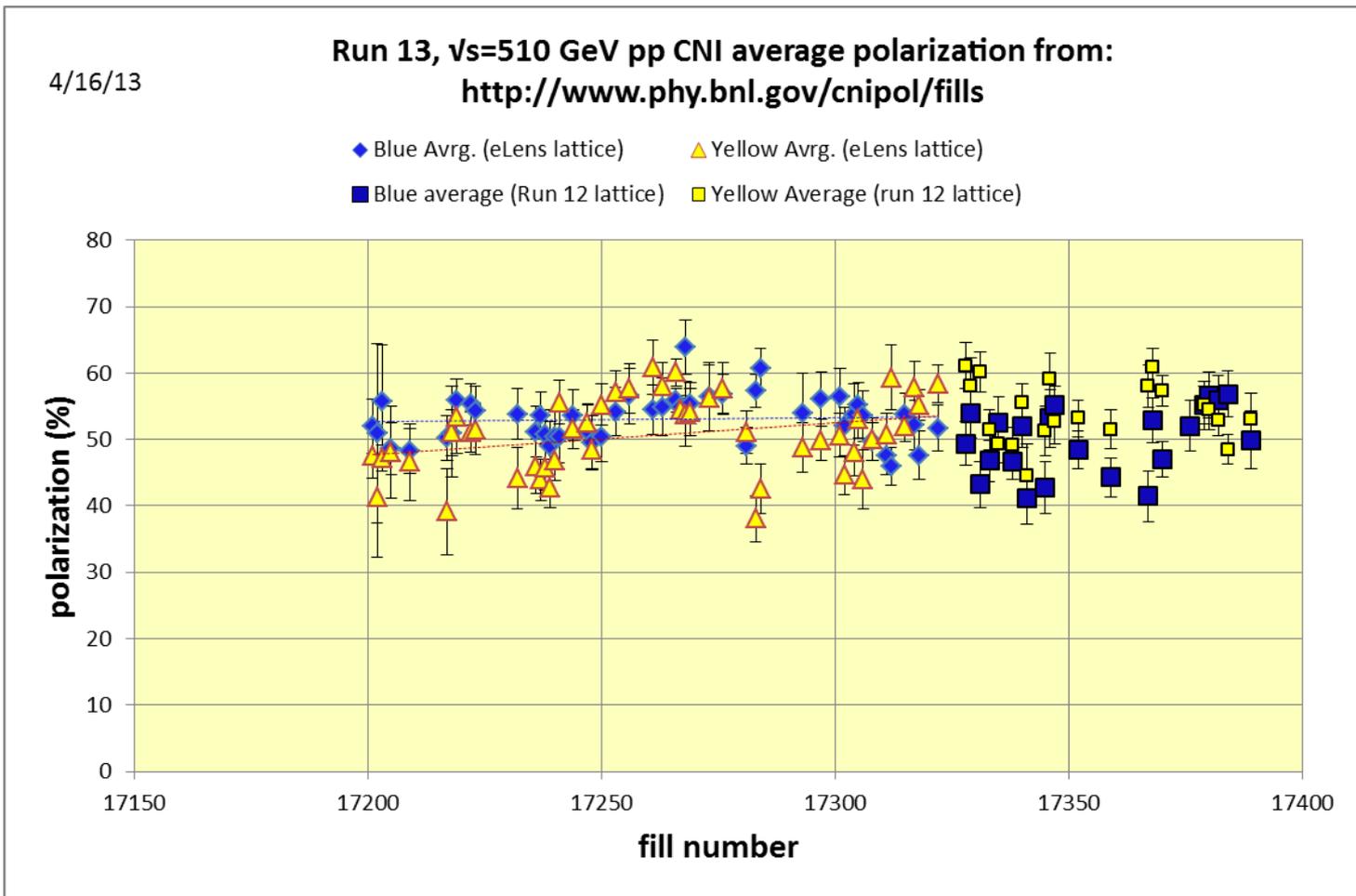
Yellow average =  $50.0 \pm 0.9\%$   
Blue average =  $42.6 \pm 0.9\%$   
stores 17328 – 17389 (Run 12 lattice)



<https://wiki.bnl.gov/rhicspin/Polarimetry/H-jet/Run13>

Yellow average =  $52.3 \pm 0.5\%$   
Blue average =  $53.5 \pm 0.5\%$   
Average = 52.9%  
stores 17201-17322 (eLens lattice)

Yellow average =  $54.0 \pm 0.7\%$   
Blue average =  $49.7 \pm 0.7\%$   
Average = 51.9%  
stores 17328-17389 (Run 12 lattice)

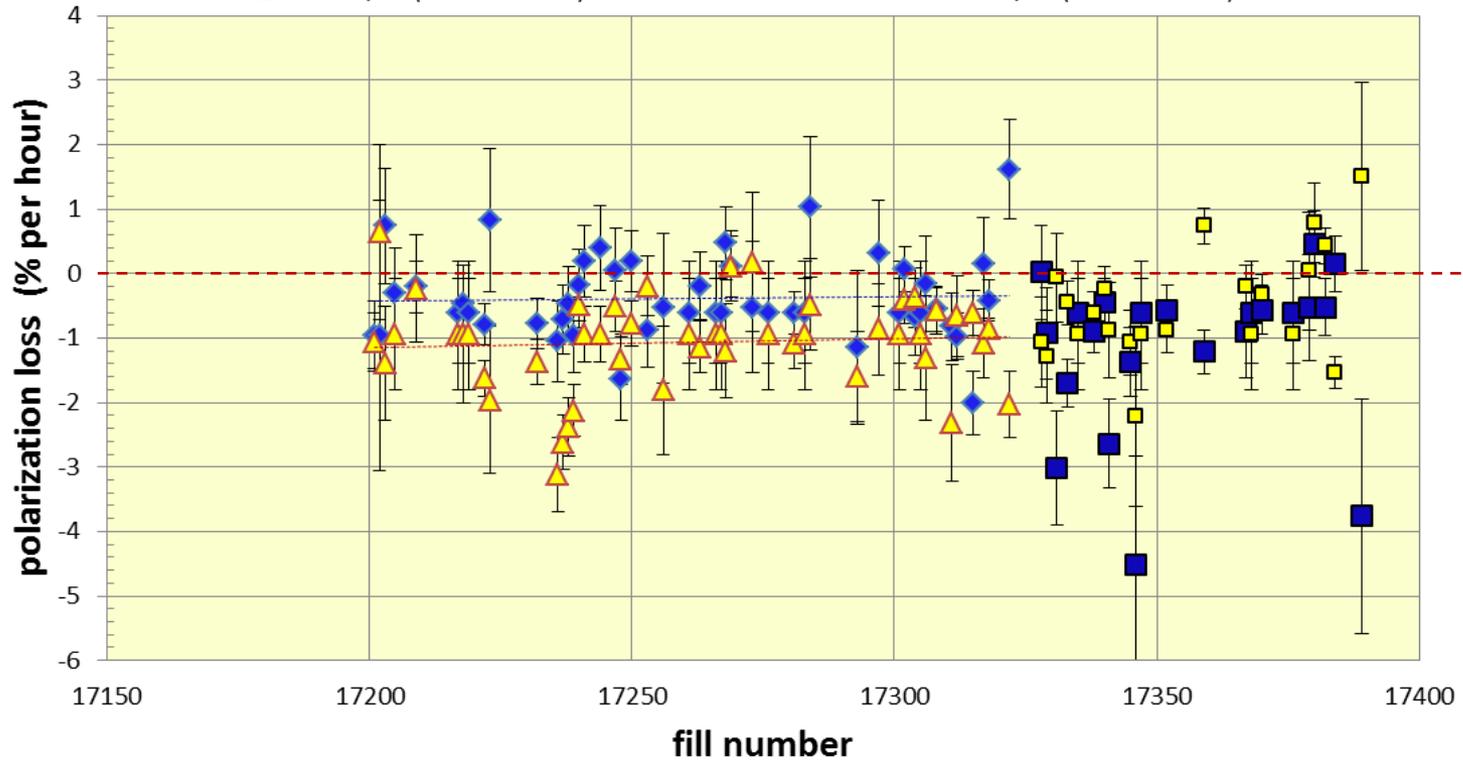


With 4/16/2013 update to all measurements

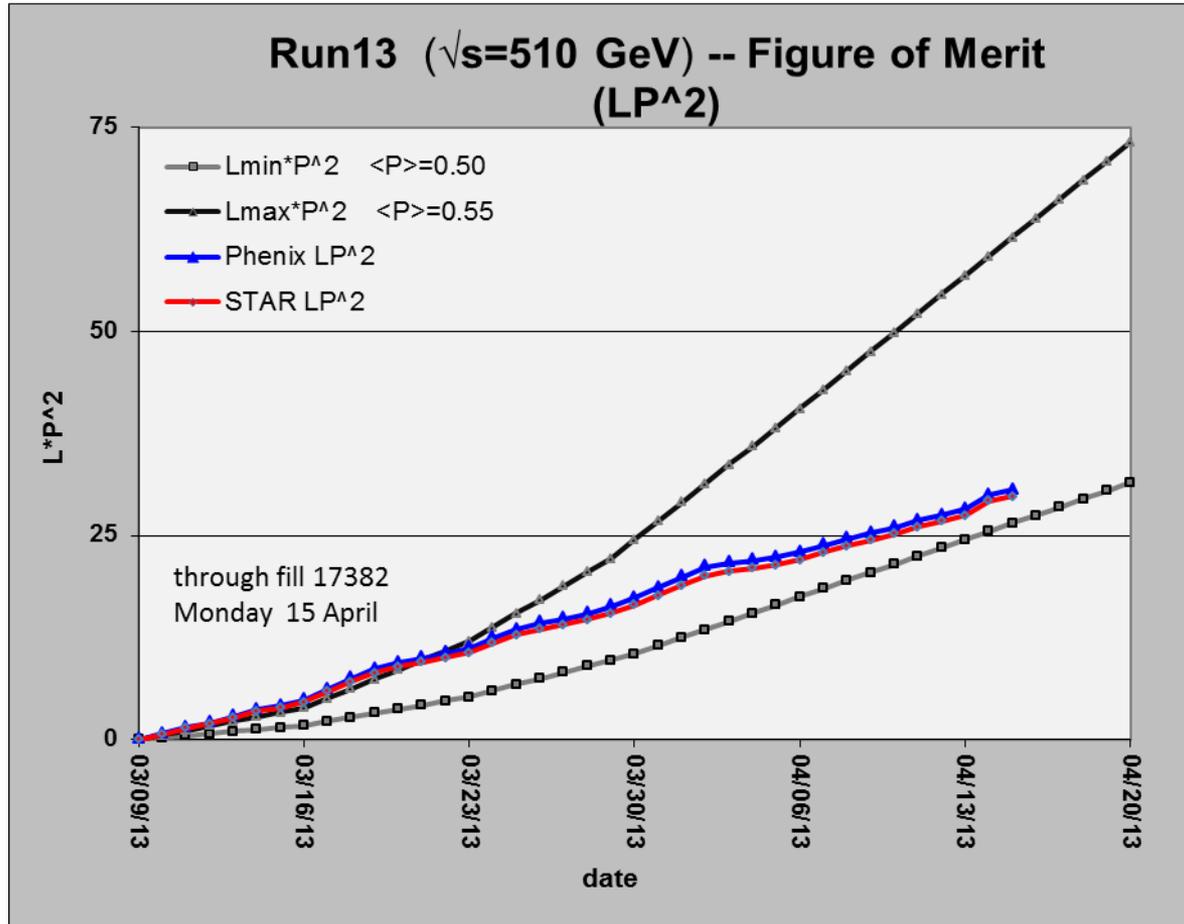
4/16/13

**Run 13,  $\sqrt{s}=510$  GeV pp CNI polarization loss at store, from:  
<http://www.phy.bnl.gov/cnipol/fills>**

- ◆ Blue dP/dT (eLens lattice)
- ▲ Yellow dP/dT (eLens lattice)
- Blue dP/dT (Run 12 lattice)
- Yellow dP/dT (Run 12 lattice)

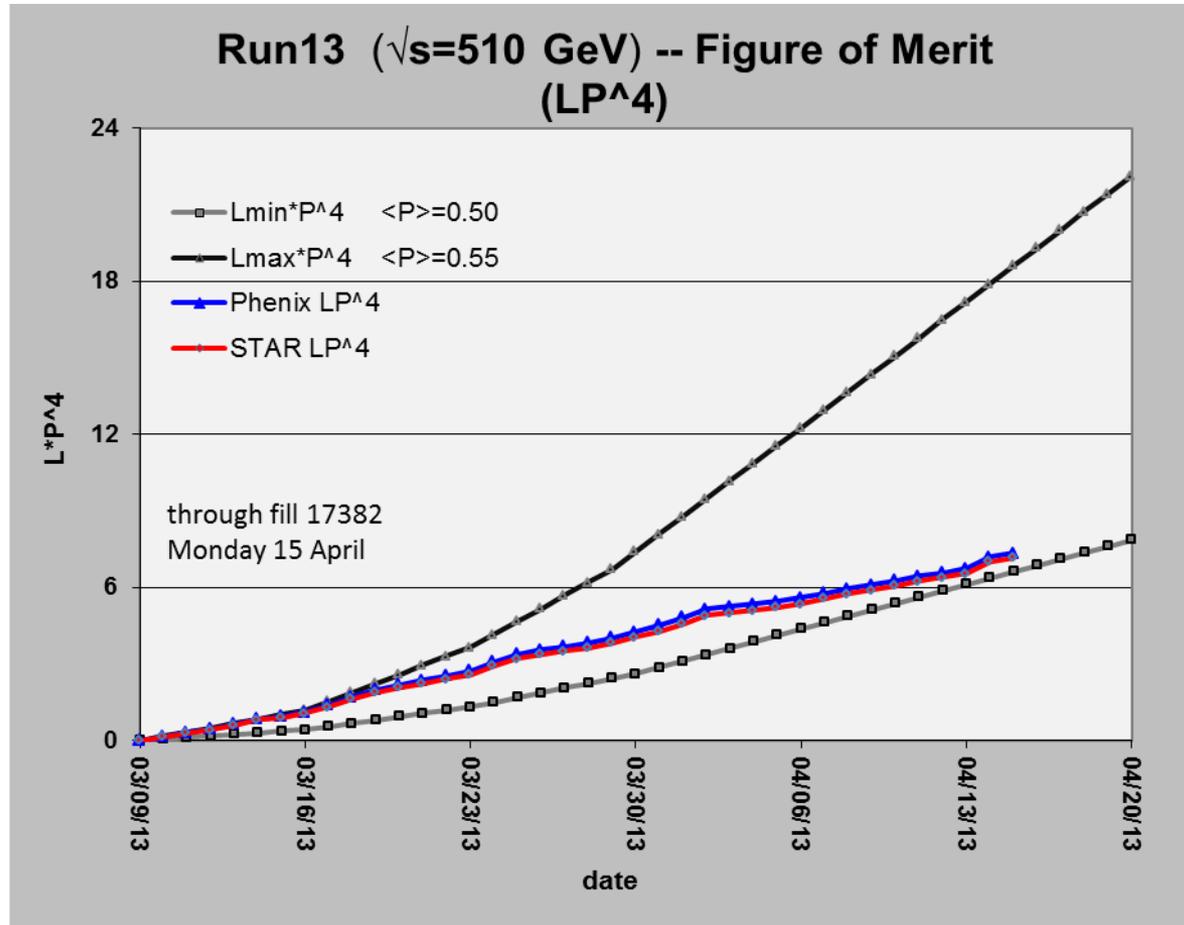


**Preliminary**, with Run 13 cross sections, PHENIX and STAR **log based singles correction**



Using average polarizations from CNI polarization from <http://www.phy.bnl.gov/cnipol/fills/>

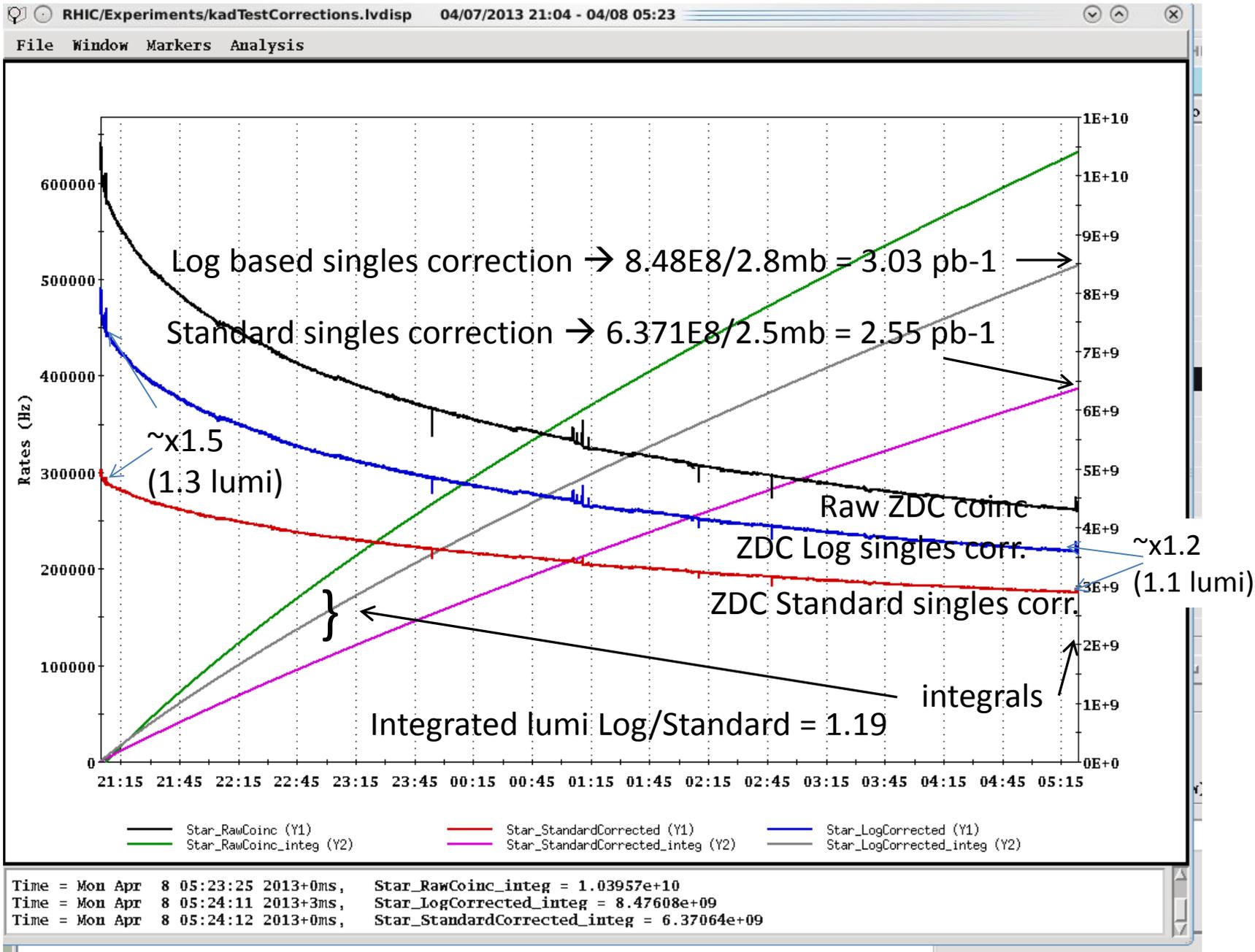
Preliminary, with Run 13 cross sections, PHENIX and STAR log based singles correction



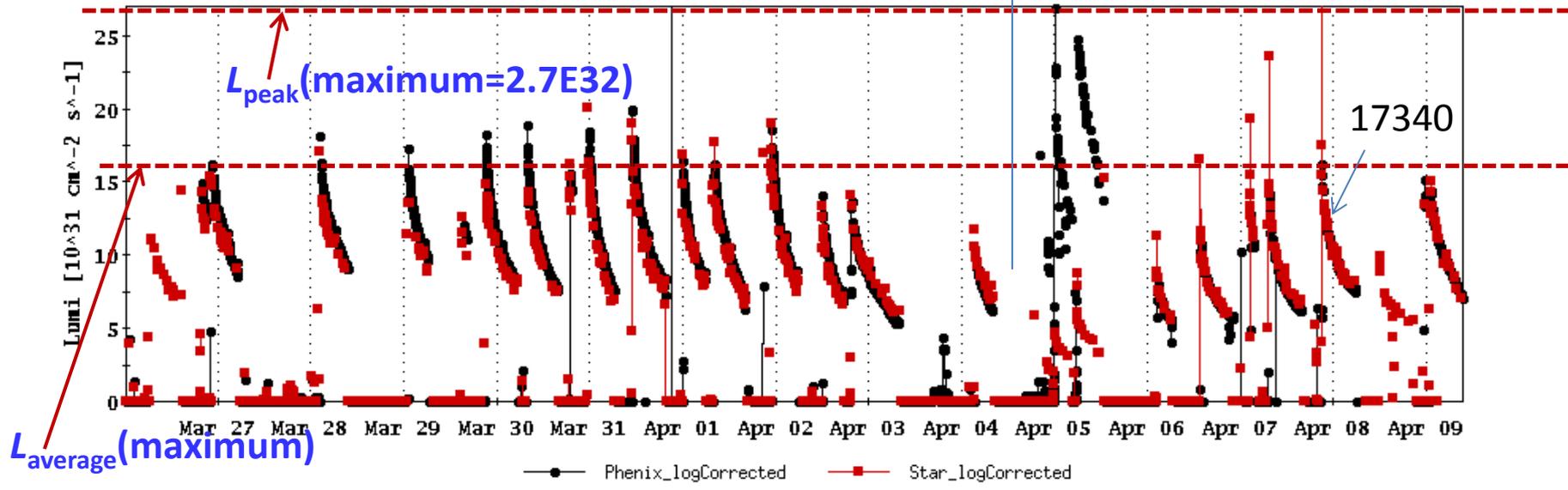
Using average polarizations from CNI polarization from <http://www.phy.bnl.gov/cnipol/fills/>

## Additional Information

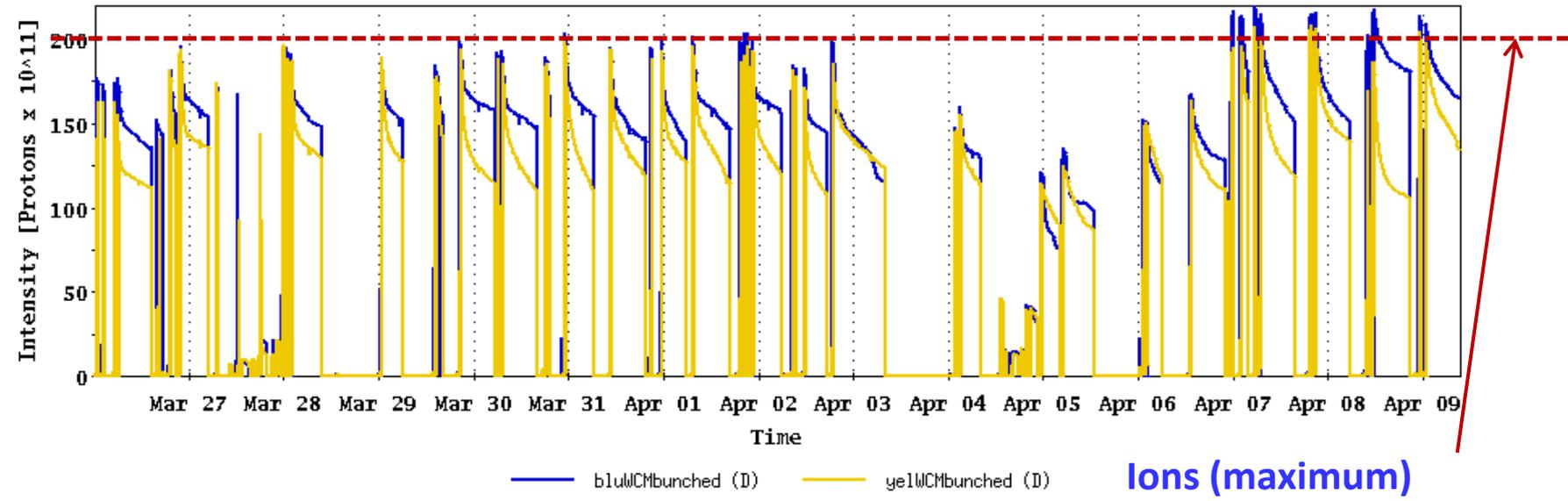
# Example Store for STAR (17340) with "physics" time cuts



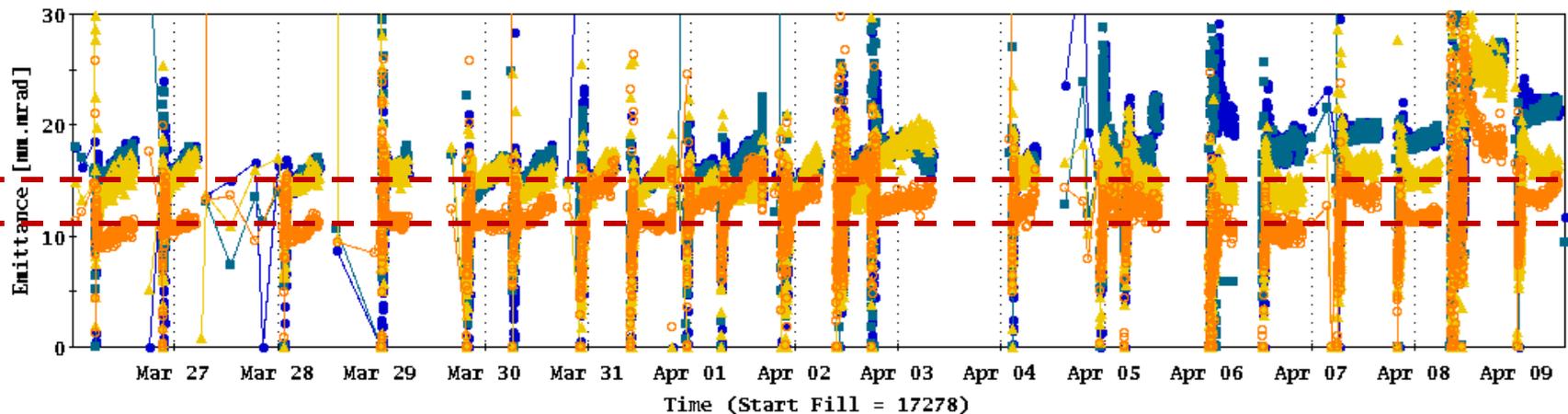
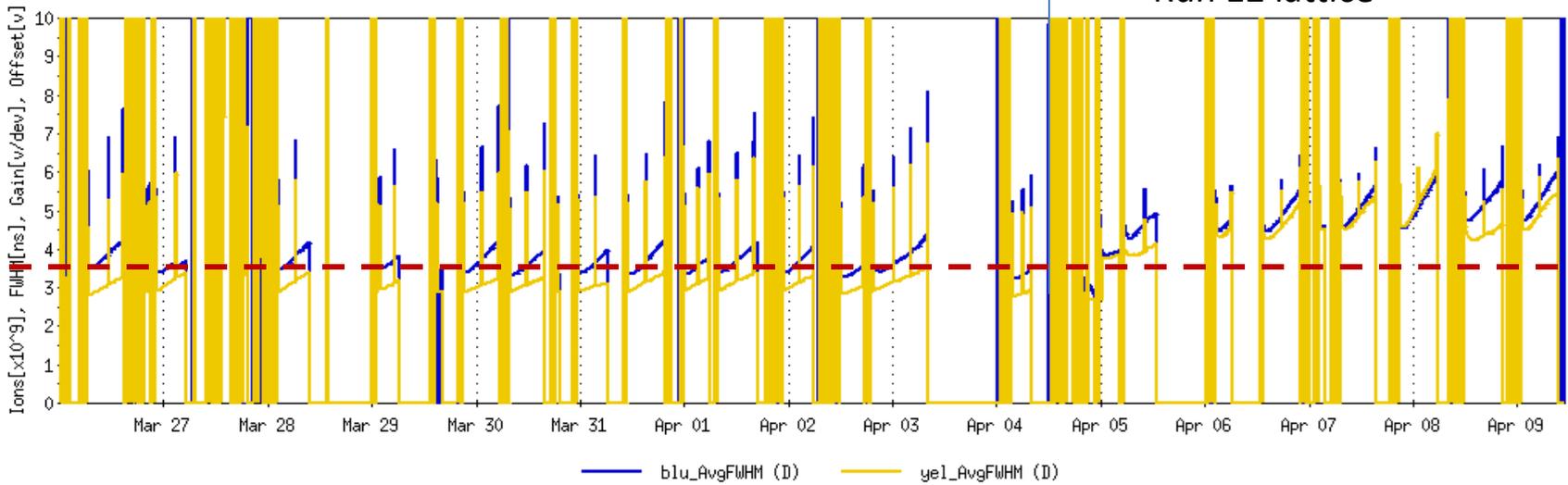
### Physics stores



### Using Run 13 cross sections with log based singles correction



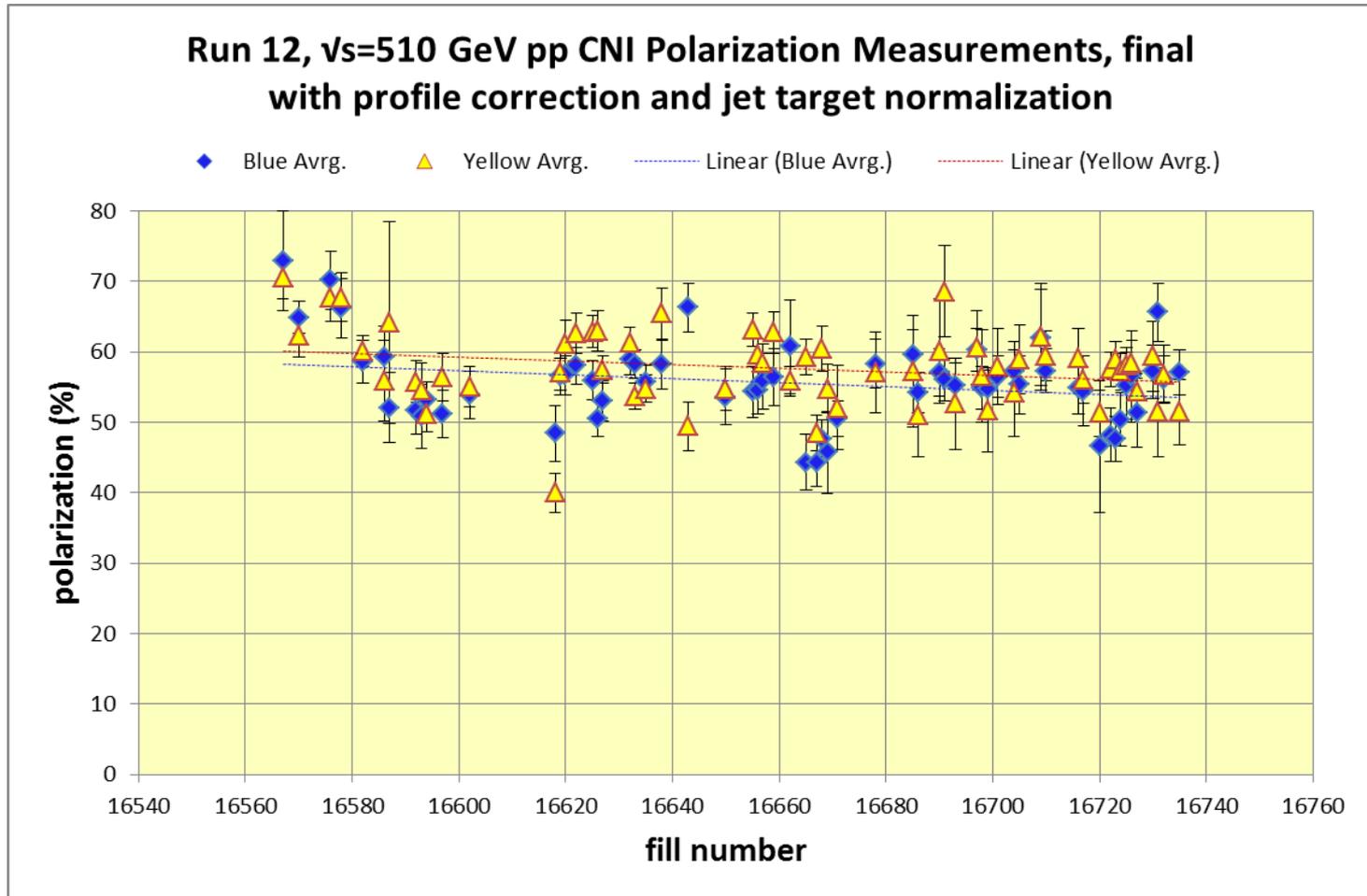
# Past 2 Weeks



- RhicIpMManager.blue\_horiz;normEmitt;valueAndTime[.] (I)
- RhicIpMManager.blue\_vert;normEmitt;valueAndTime[.] (I)
- RhicIpMManager.yellow\_horiz;normEmitt;valueAndTime[.] (I)
- RhicIpMManager.yellow\_vert;normEmitt;valueAndTime[.] (I)

Yellow average =  $48.12 \pm 0.4\%$

Blue average =  $53.1 \pm 0.5\%$

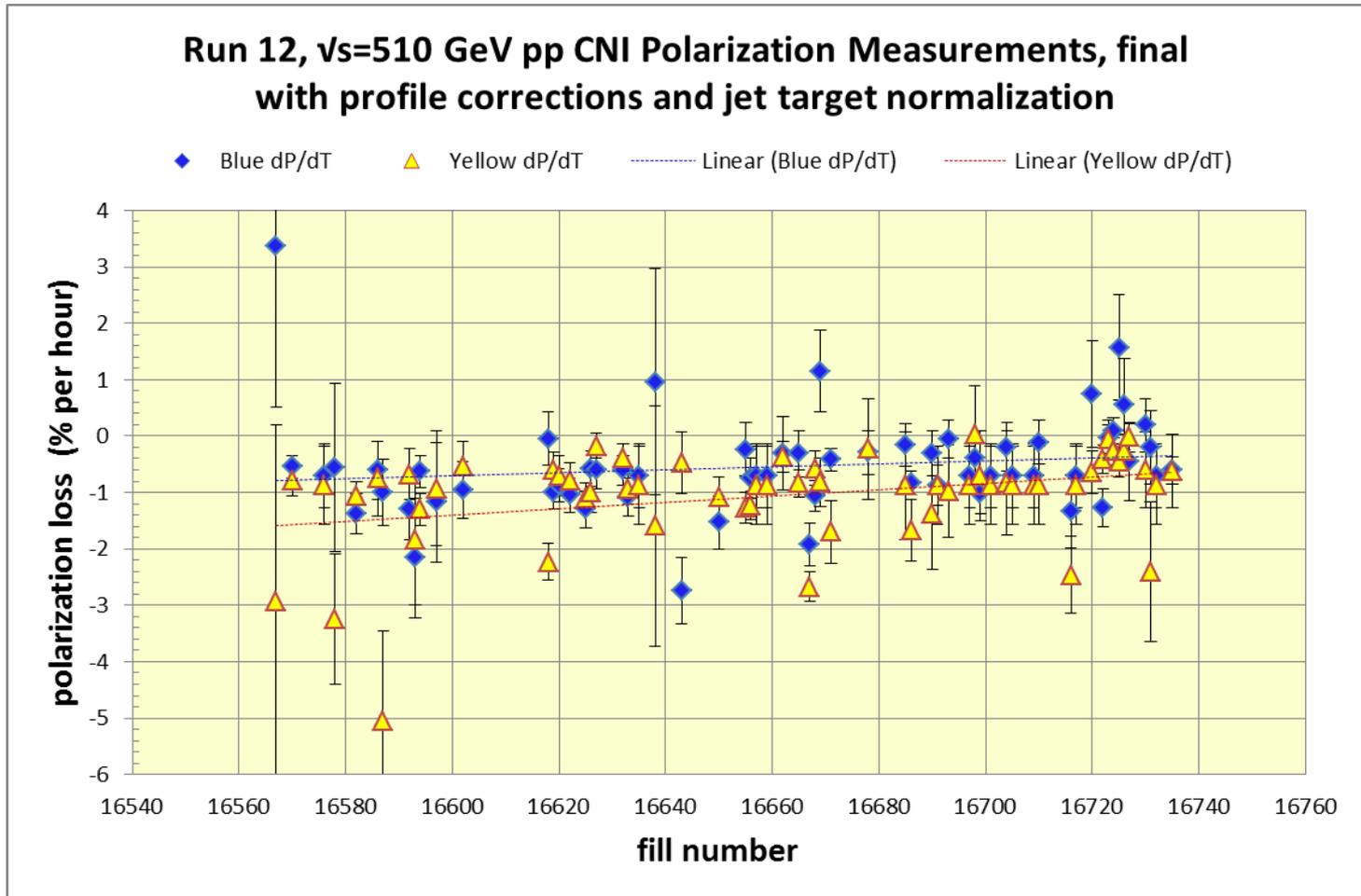


<http://www.phy.bnl.gov/cnipol/fills/>

Yellow average =  $57.7 \pm 0.4\%$

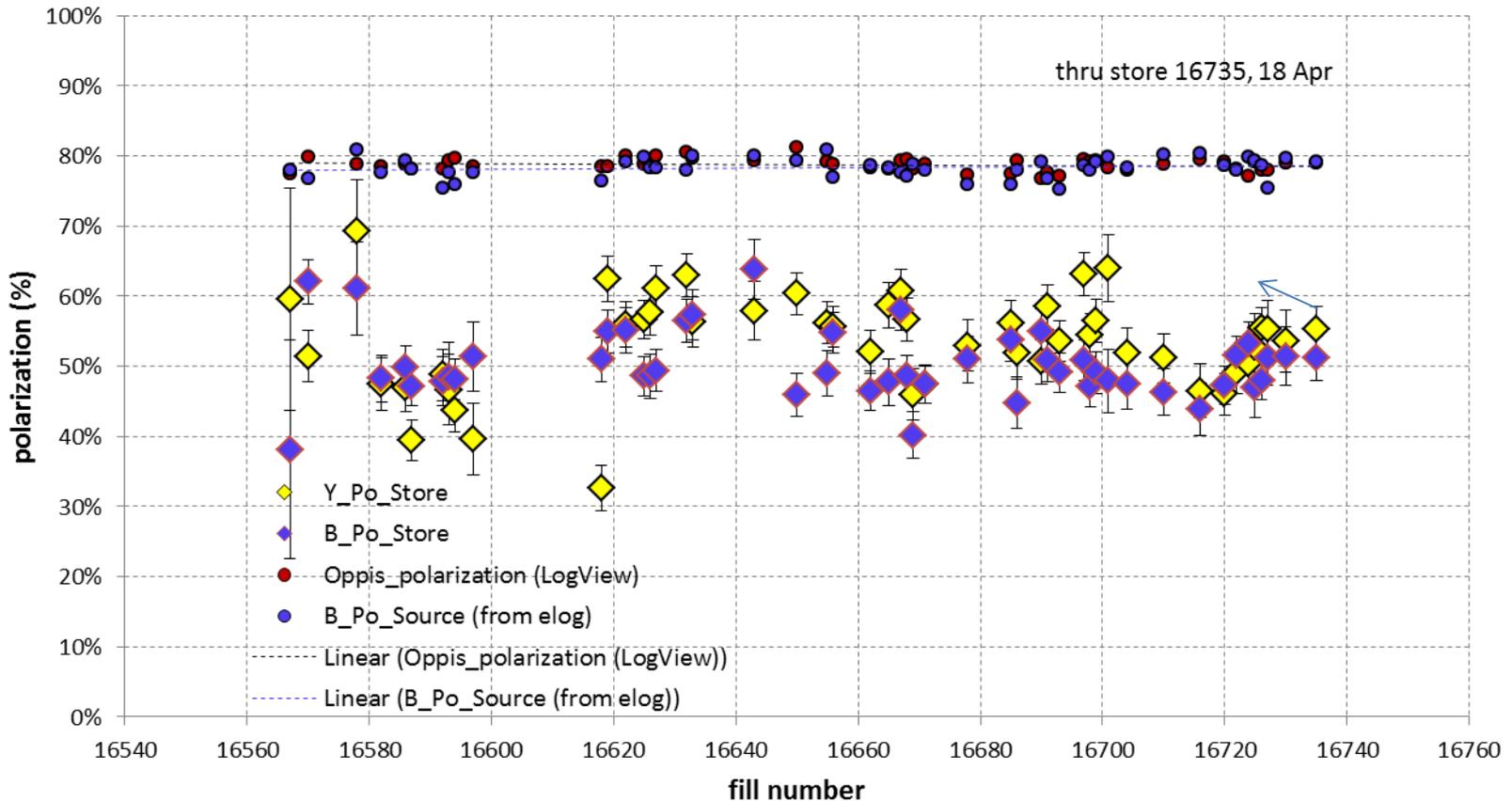
Blue average =  $55.9 \pm 0.4\%$

Average =  $56.8\%$



<http://www.phy.bnl.gov/cnipol/fills/>

## Run12 255 x 255 Gev pp Jet target Polarization final results



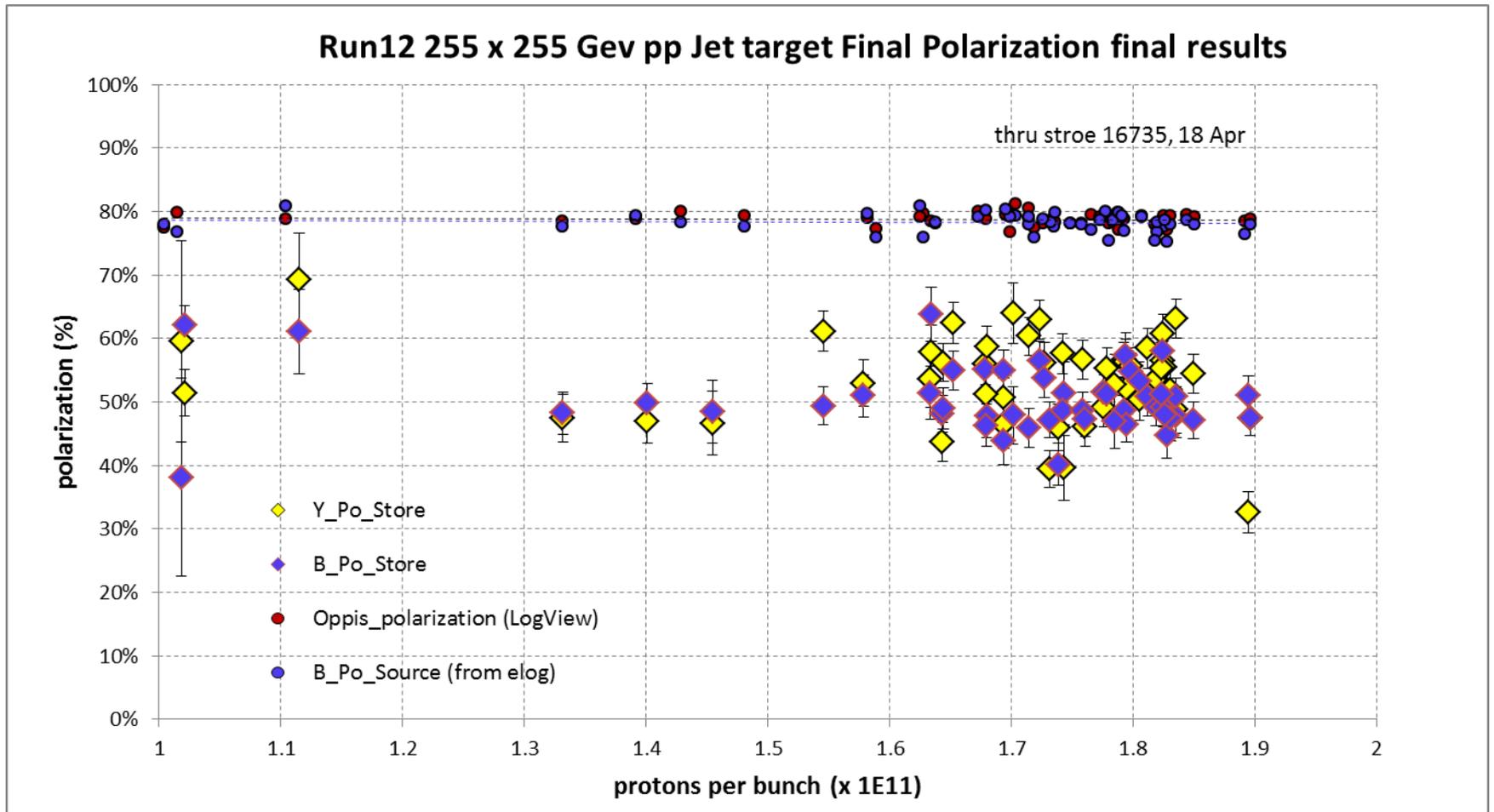
**And Yellow beam at injection jet target Run 12 result =  $63.0 \pm 4.4\%$**

Blue jet target weighted average =  $50.3\% \pm 0.5\%$

Yellow jet target weighted average =  $53.4\% \pm 0.5\%$

Yellow average =  $53.4 \pm 0.5\%$

Blue average =  $50.3 \pm 0.5\%$

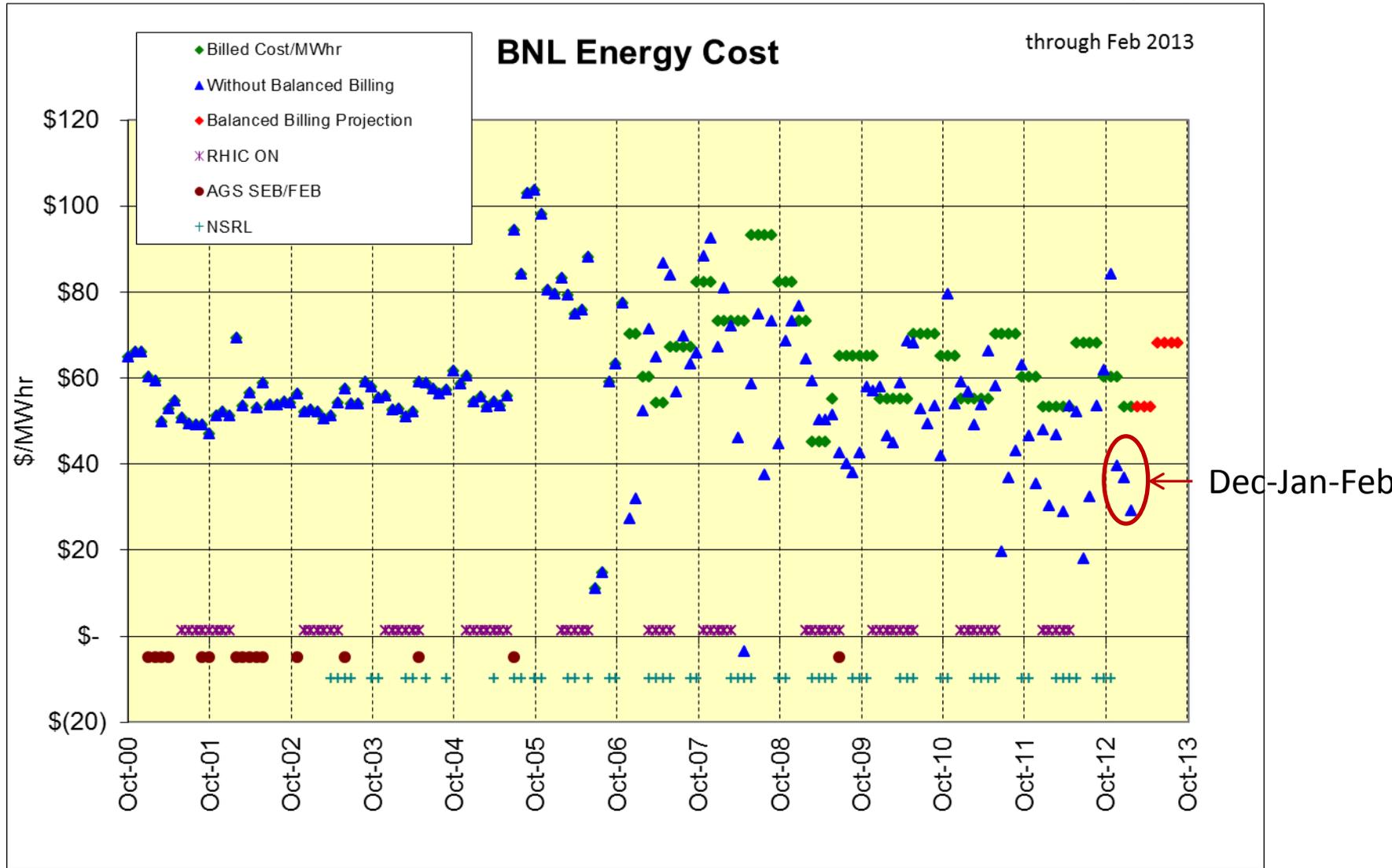


**Feb 2013 bill**

\$28.89 actual

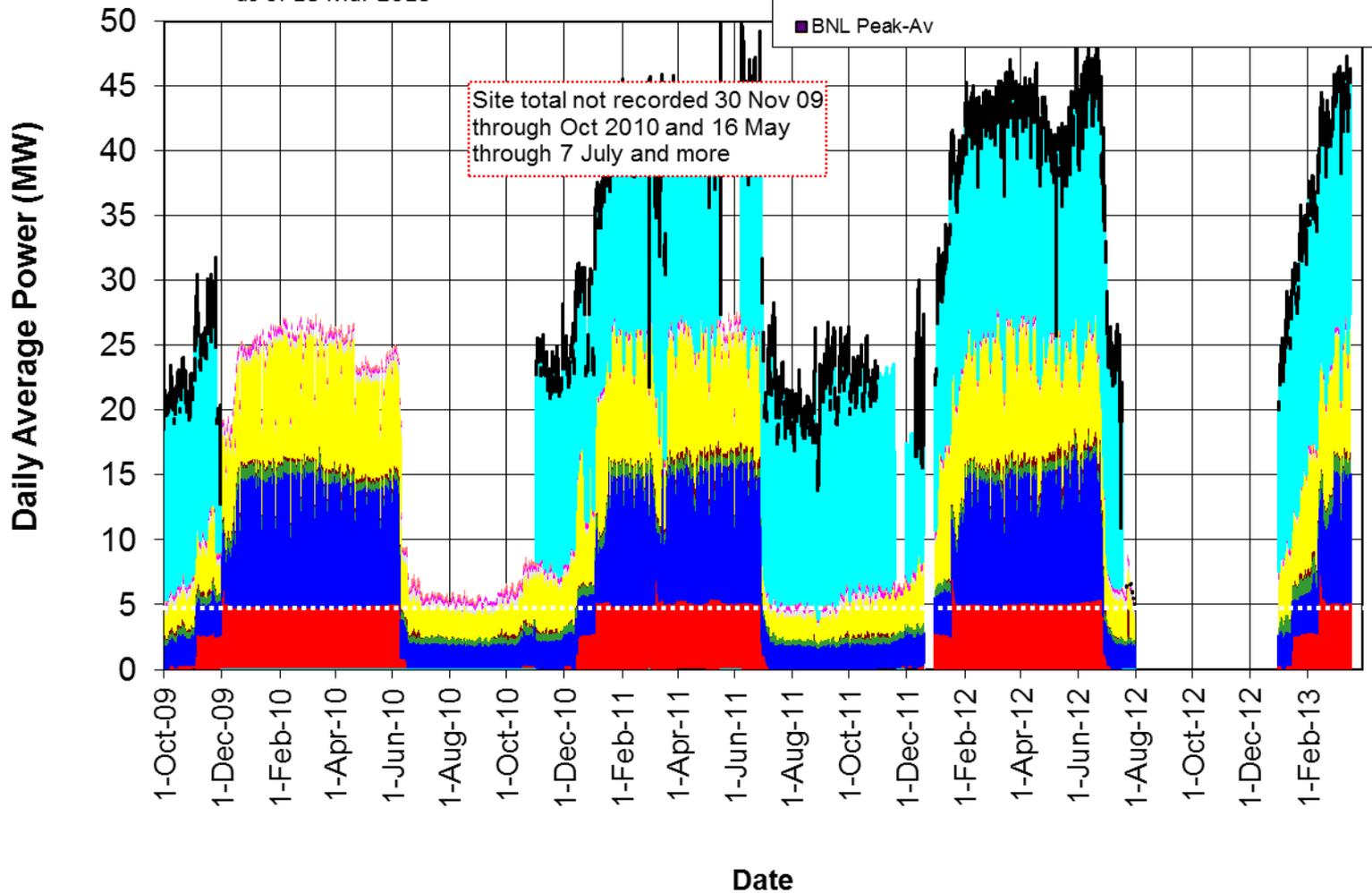
billed at \$53/Mwhr

+\$1,132K in BNL bank through Feb 2013



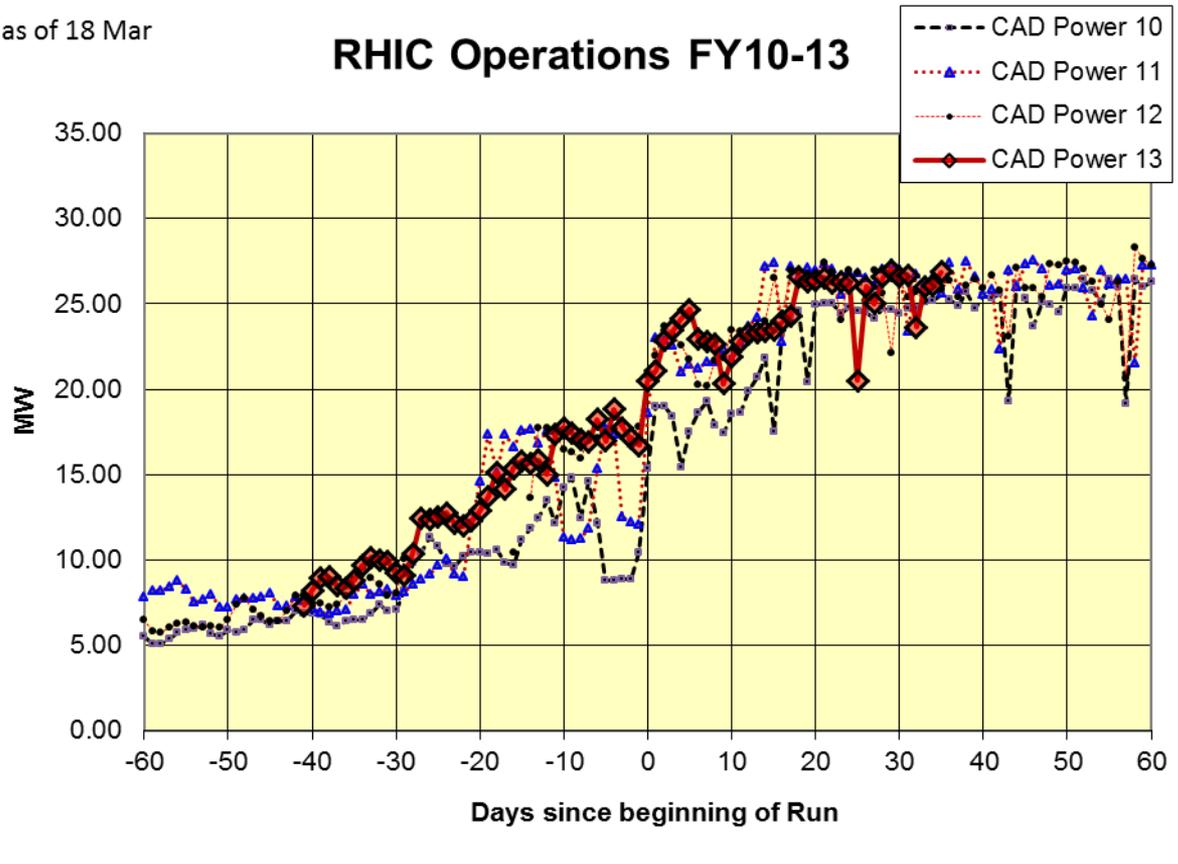
# BNL Energy Use FY 2010-13

as of 18 Mar 2013



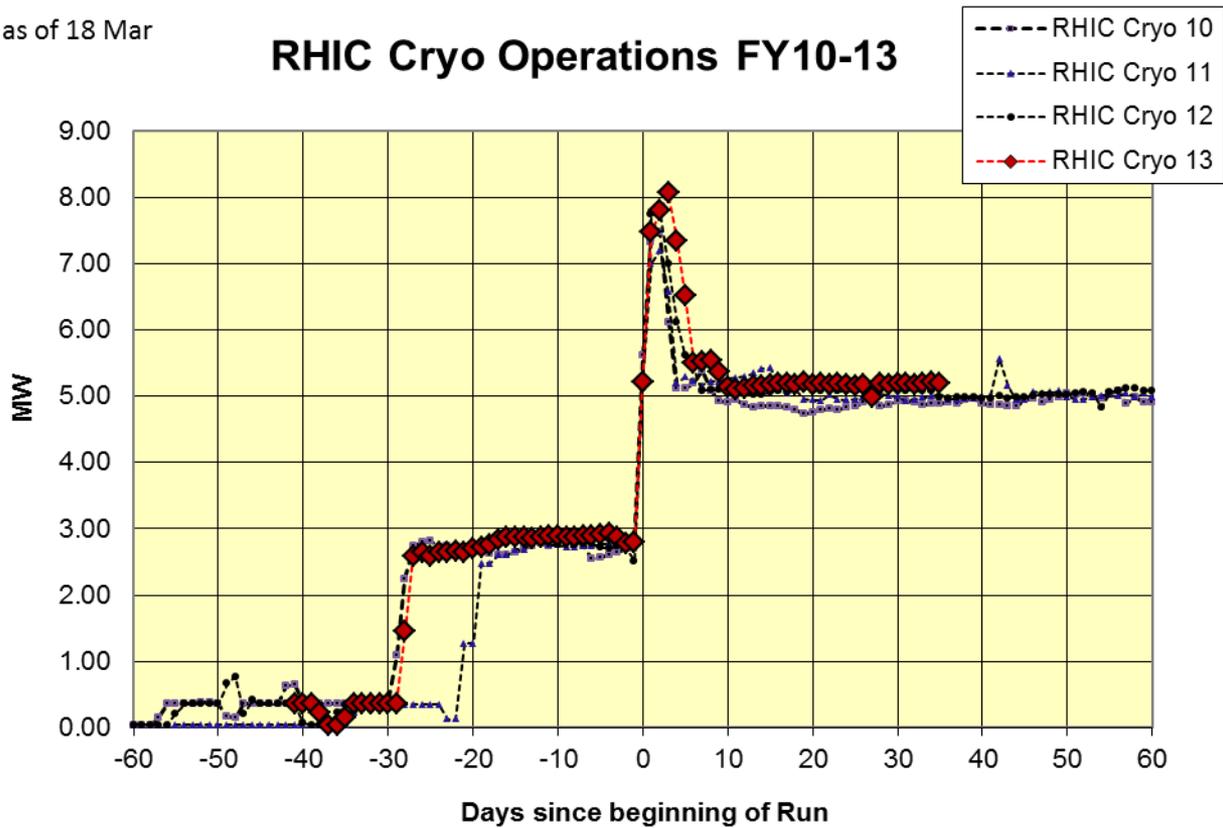
as of 18 Mar

# RHIC Operations FY10-13



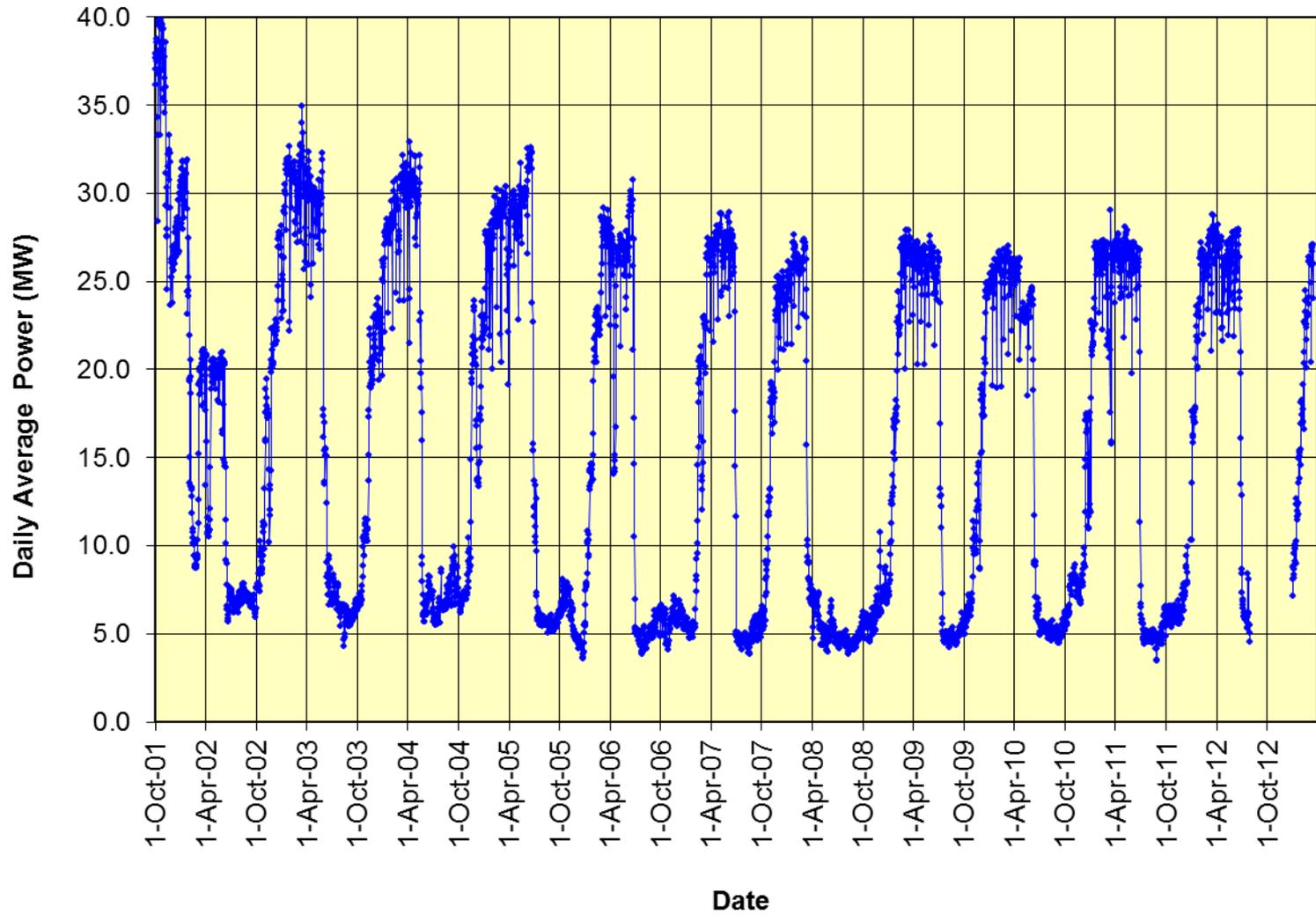
as of 18 Mar

# RHIC Cryo Operations FY10-13

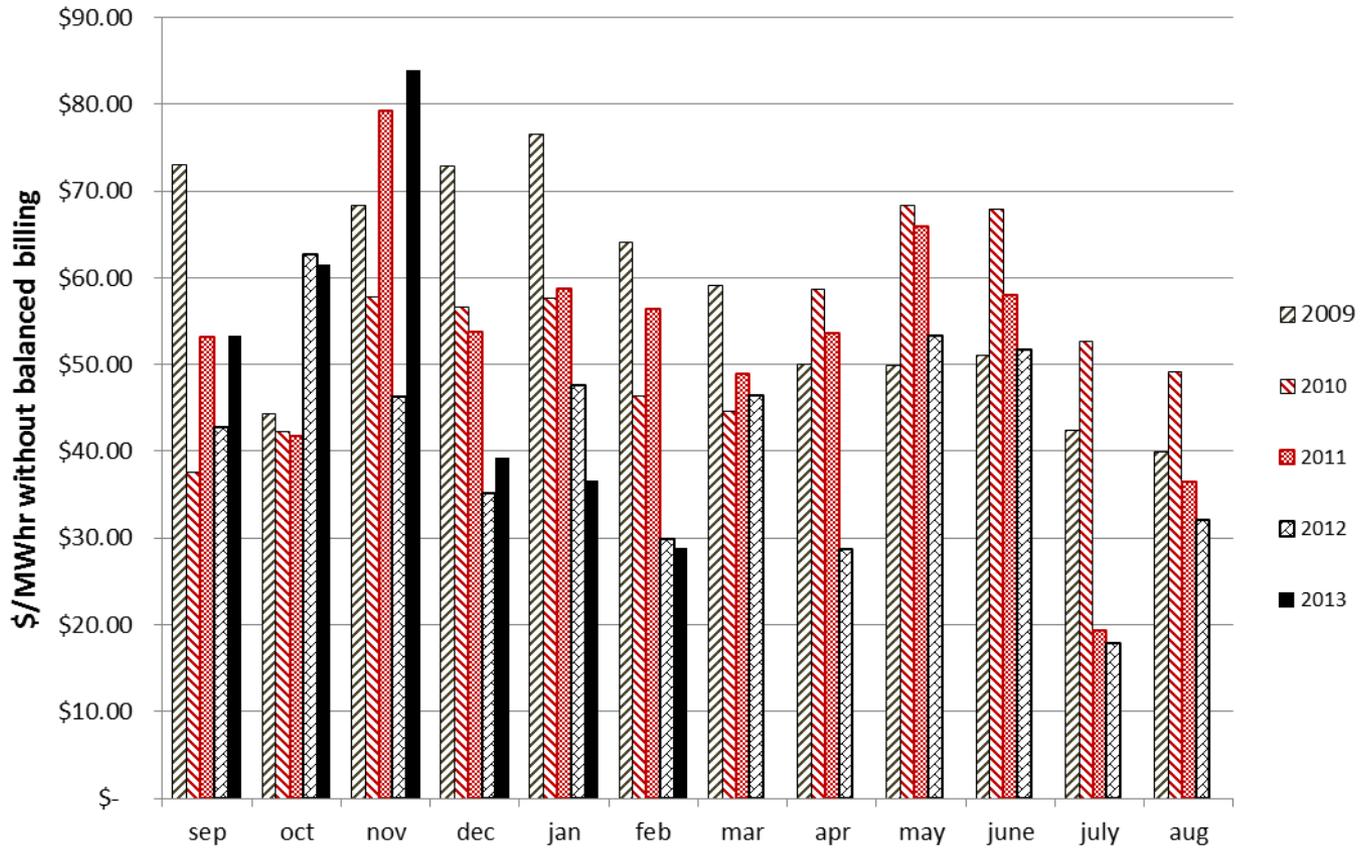


as of 18 Mar 2013

# C-AD Energy Use FY 2002-13



# BNL Electricity Cost

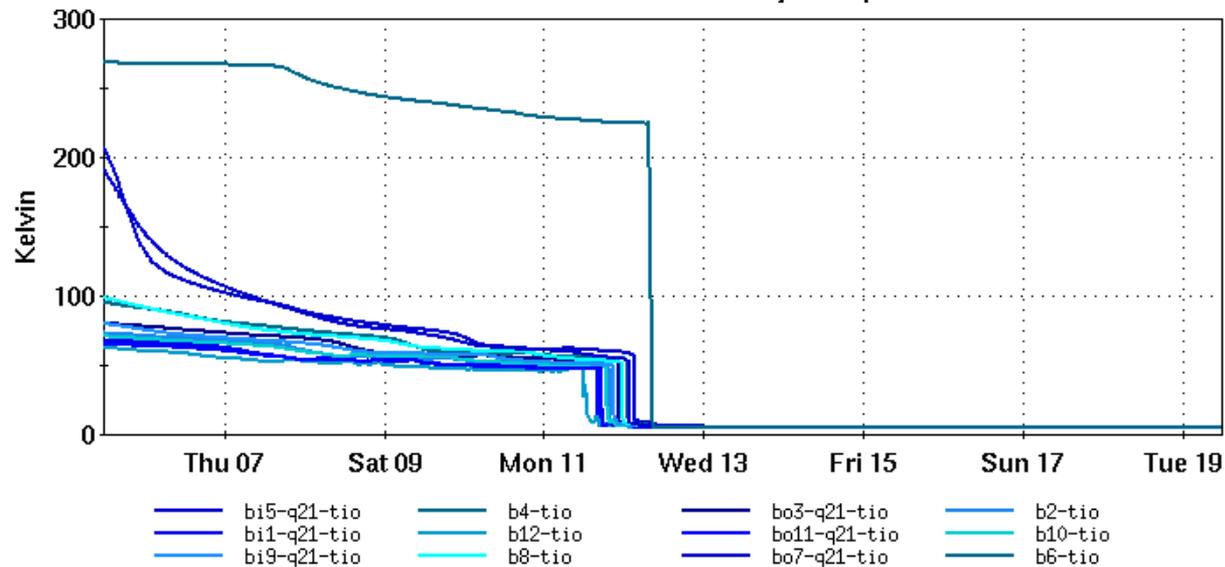


# Cryogenic Blue & Yellow Rings (14 days)

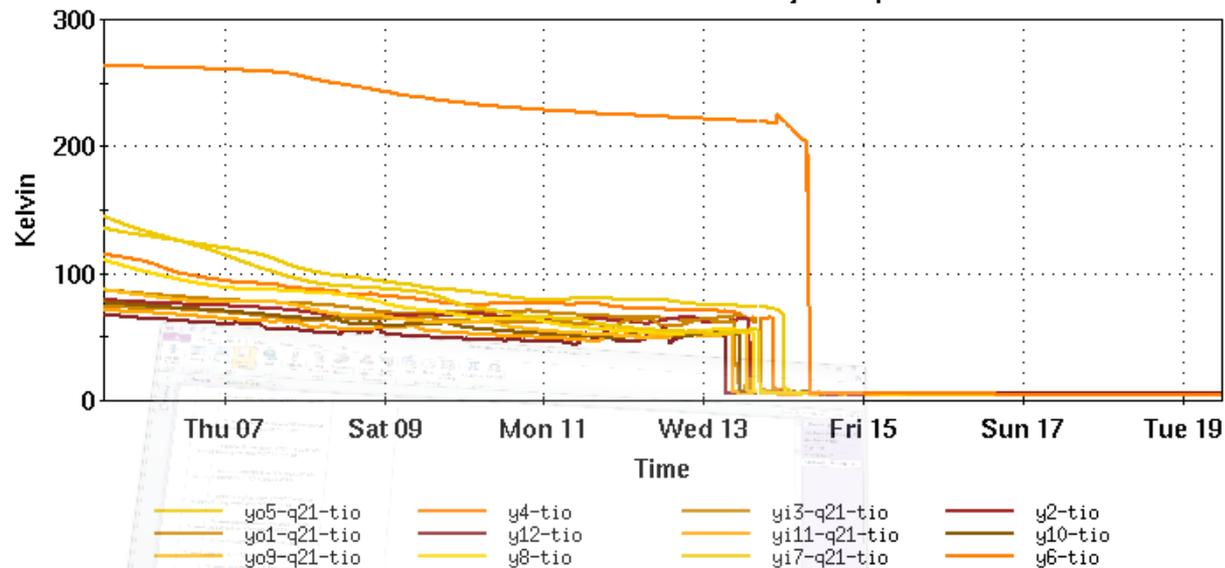
[Ring Summary \(1 day\)](#) [Sector Plots \(1 day\)](#) [Sector Plots \(14 days\)](#)

File Window Markers Analysis

### Blue Cryo Temperatures



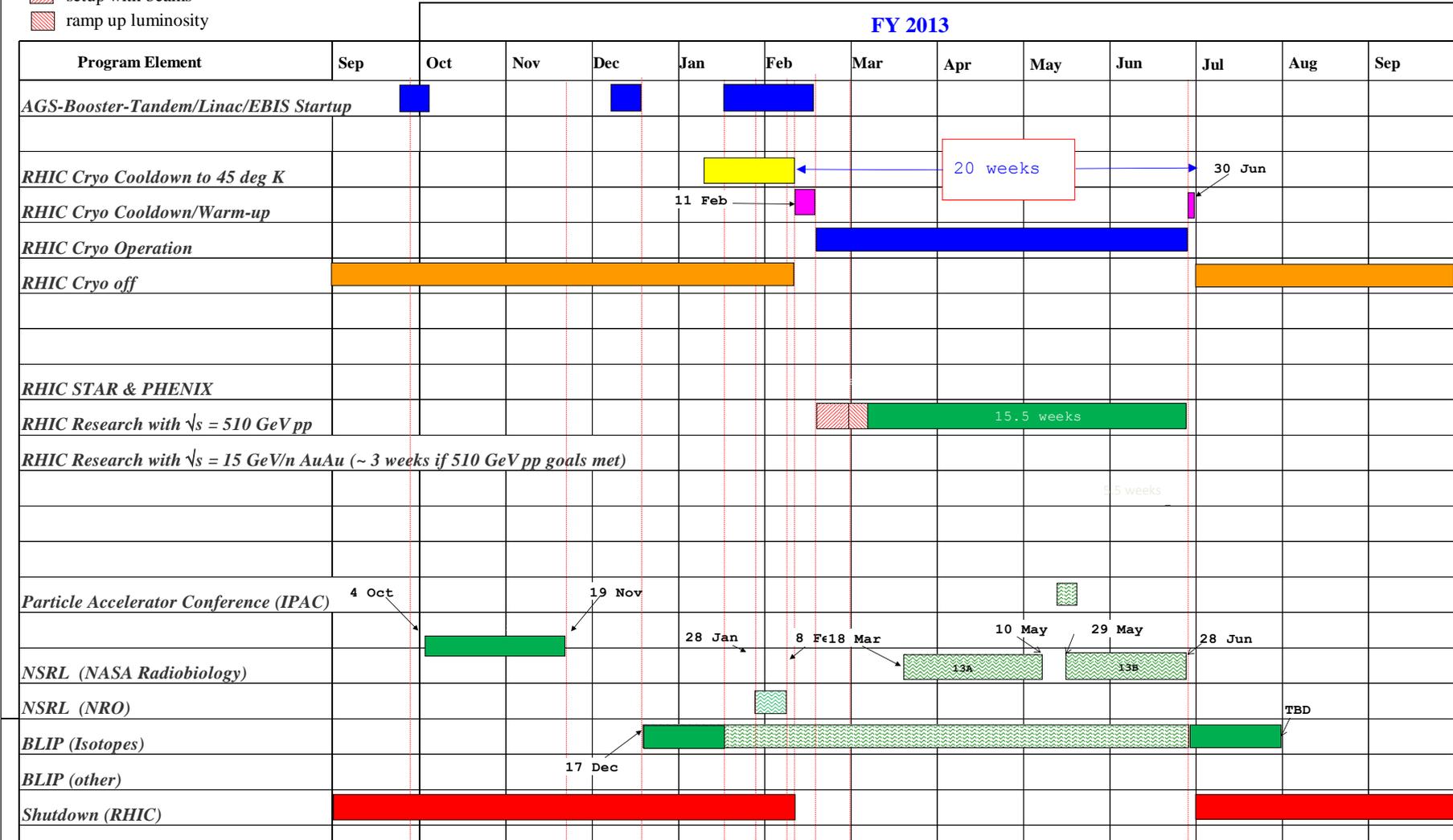
### Yellow Cryo Temperatures



# C-A Operations-FY13

*planned, budget permitting, Preliminary*

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



For Run 13 the PAC recommends the following (*in order of priority*):

1. Running with polarized proton collisions at 500 GeV to provide an integrated luminosity of  $750 \text{ pb}^{-1}$  at an average polarization of 55%.
2. Depending on the amount of running time remaining after priority #1
  - a. If less than 3 weeks remain, a week of 200 GeV Au+Au collisions.
  - b. If at least 3 weeks of running time remain, 3 weeks of 15 GeV Au+Au collisions.
3. 8 days of 62 GeV p+p collisions.
4. At the discretion of the ALD, 4 days of low-luminosity running to accomplish the pp2pp goals.