Run 13 RHIC Machine/Experiments Meeting

9 April 2013

Agenda:

- Status Reports
- Lumi as determined from ZDC's revisited again

Run 13 plan based on 20 weeks cryo operation

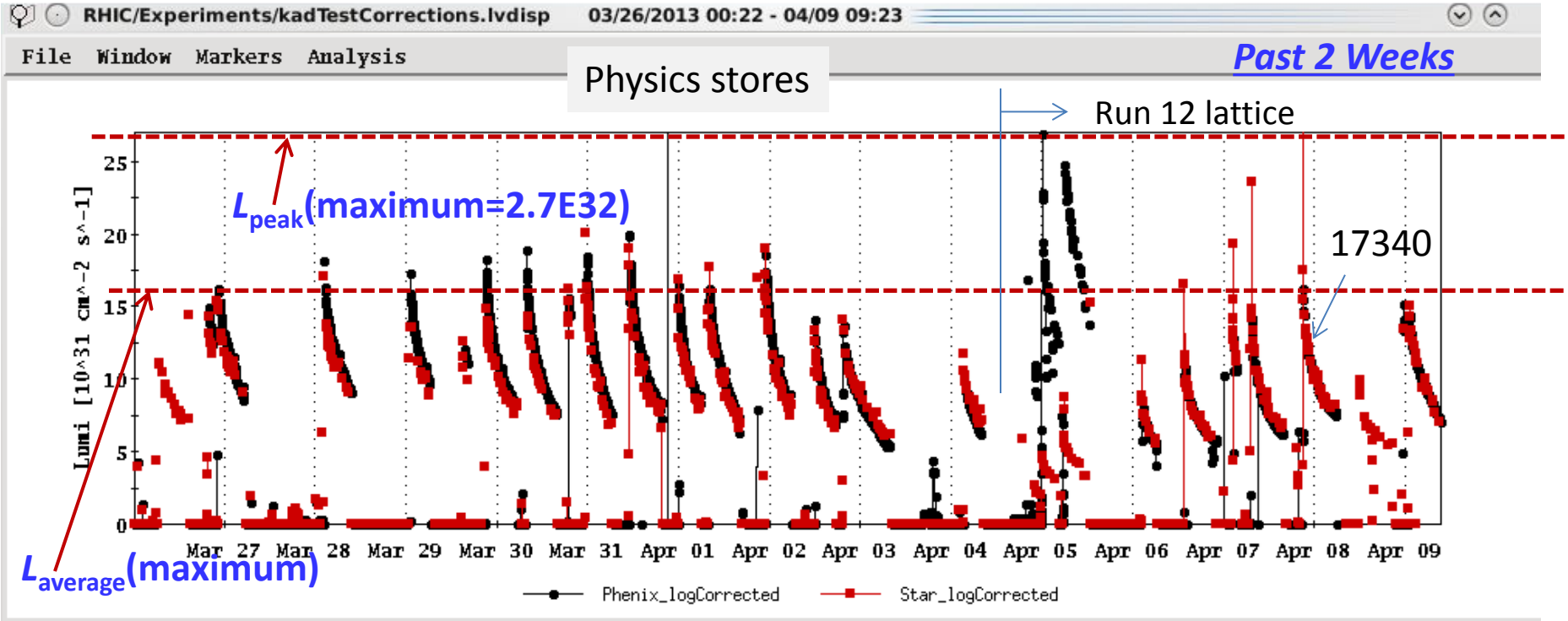
and Fischer et.al. RHIC Collider Projections (FY 2013 – FY 2017), 27 Sep 2012

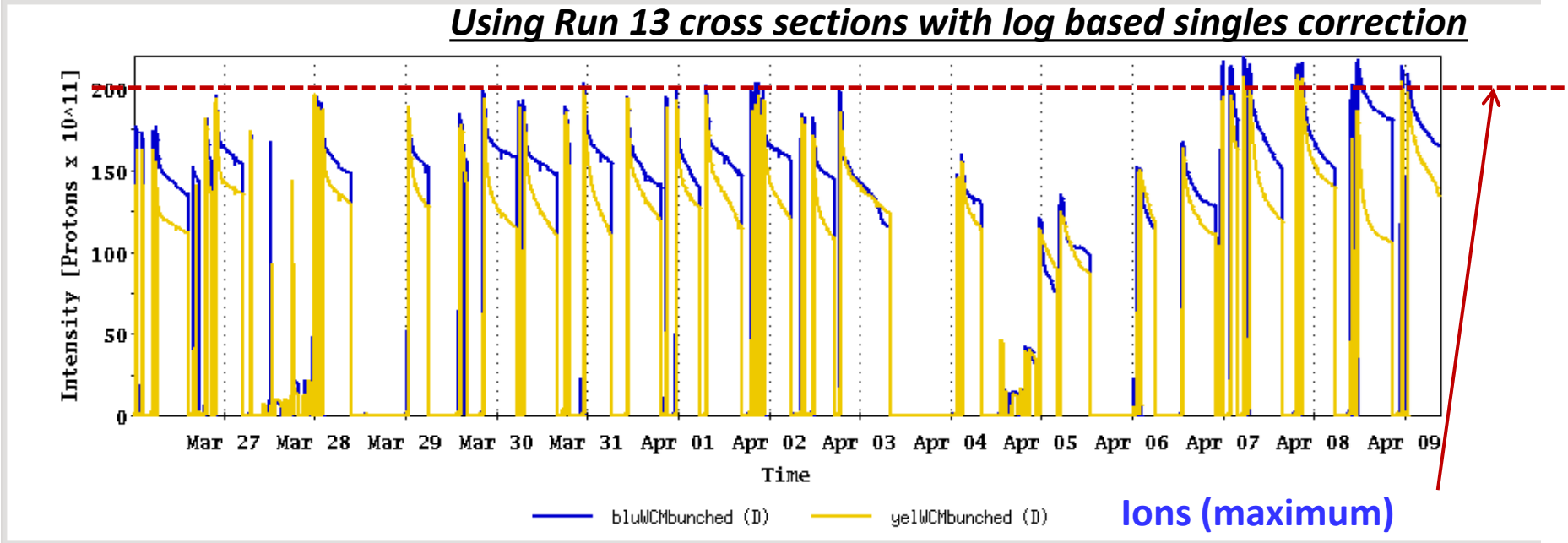
- ✓ 11 Feb, Begin cool-down to 4.5K
- ✓ 15 Feb, Cool-down to 4.5K in Blue and Yellow Ring complete, begin magnet setup
- ✓ 26 Feb, first collisions
- ✓ 15 Feb -1 Mar, RHIC √s = 510 GeV pp machine setup
- ✓ 1-8 Mar, machine ramp-up with 8 hr/night for experiment setup
- ✓ 9 Mar (store 17201), begin √s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

today, 9 Apr…

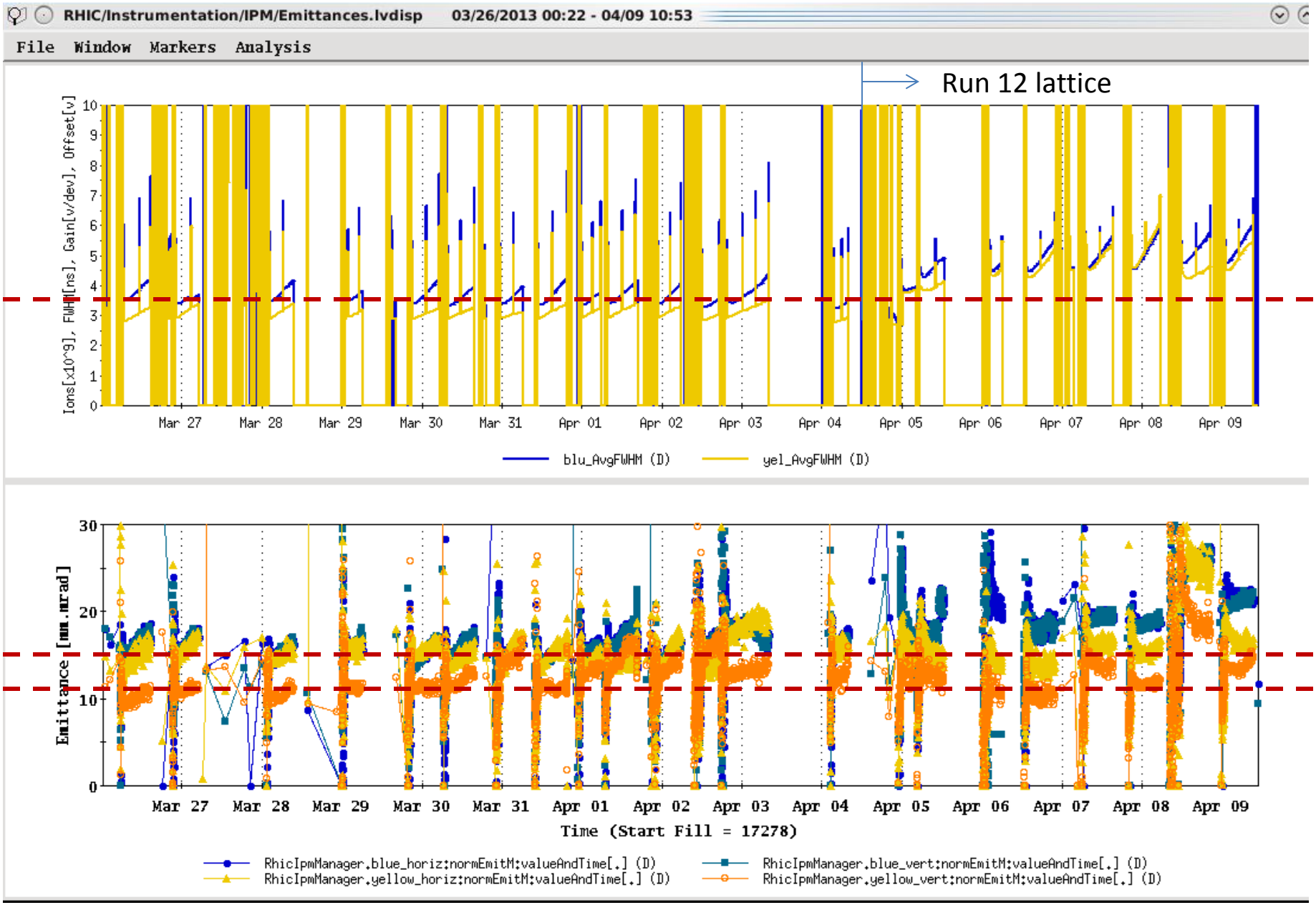
- 27 May, end 15 cryo weeks
- 6 Jun, switch to √s = 15 GeV/n AuAu if pp goals are met and end 12.7 week √s = 510 GeV pp physics run
- 27 Jun, end ~2.5 week √s = 15 GeV/n AuAu physics run or 15.9 week √s = 510 GeV pp physics run, begin cryo warm-up
- 30 June, cryo warm-up ~complete (19.9 cryo-weeks)

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

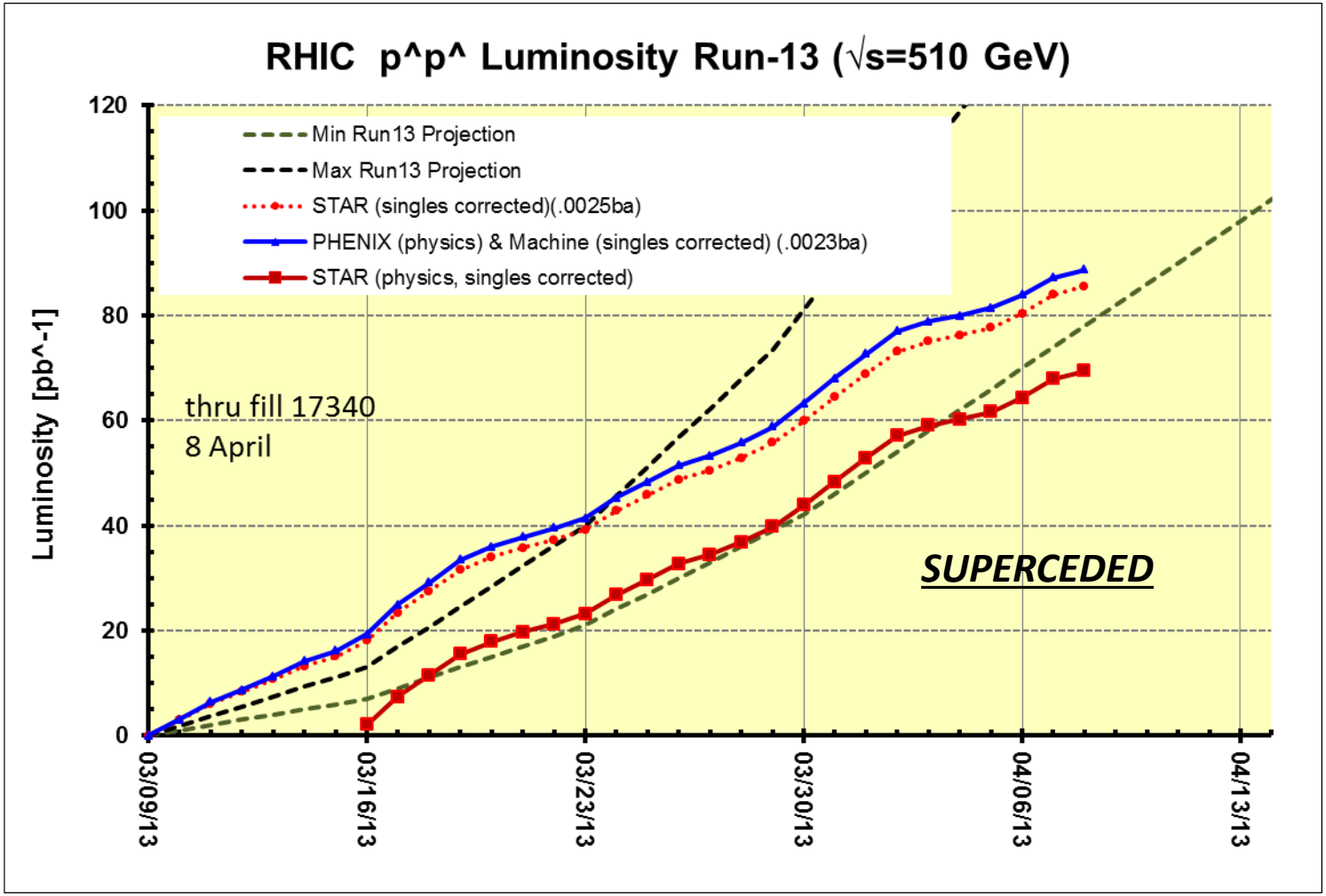

RHIC/Experiments/kadTestCorrections.lvdisp
03/26/2013 00:22 - 04/09 09:23
File Window Markers Analysis
Physics stores
Past 2 Weeks
Run 12 lattice
L_{peak}(maximum=2.7E32)
17340
$L_{average}$(maximum)
Lumi [10^31 cm^-2 s^-1]
Mar 27 Mar 28 Mar 29 Mar 30 Mar 31 Apr 01 Apr 02 Apr 03 Apr 04 Apr 05 Apr 06 Apr 07 Apr 08 Apr 09
Phenix_logCorrected
Star_logCorrected


Using Run 13 cross sections with log based singles correction
Intensity [Protons x 10^11]
Mar 27 Mar 28 Mar 29 Mar 30 Mar 31 Apr 01 Apr 02 Apr 03 Apr 04 Apr 05 Apr 06 Apr 07 Apr 08 Apr 09
Time
blueWCMbunched (D)
yellWCMbunched (D)
Ions (maximum)

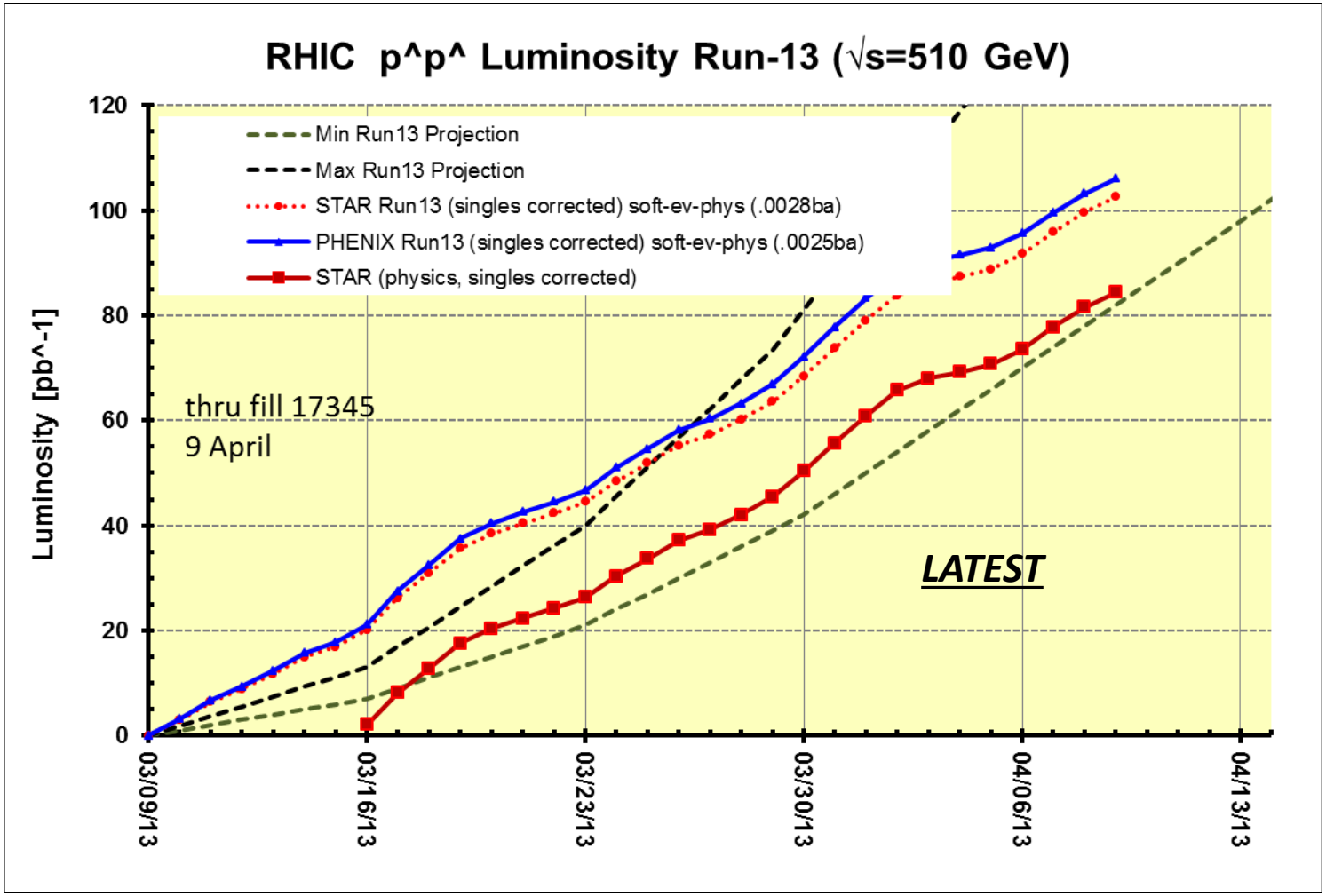
Past 2 Weeks


RHIC/Instrumentation/IPM/Emittances.lvdisp
03/26/2013 00:22 - 04/09 10:53
File Window Markers Analysis
Run 12 lattice
Ions[x10^9], FWHM[ns], Gain[v/dev], Offset[v]
Mar 27 Mar 28 Mar 29 Mar 30 Mar 31 Apr 01 Apr 02 Apr 03 Apr 04 Apr 05 Apr 06 Apr 07 Apr 08 Apr 09
blu_AvgFWHM (D)
yel_AvgFWHM (D)
Emittance [mm.mrad]
Time (Start Fill = 17278)
RhicIpmManager.blue_horiz:normEmitM:valueAndTime[.] (D)
RhicIpmManager.yellow_horiz:normEmitM:valueAndTime[.] (D)
RhicIpmManager.blue_vert:normEmitM:valueAndTime[.] (D)
RhicIpmManager.yellow_vert:normEmitM:valueAndTime[.] (D)

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



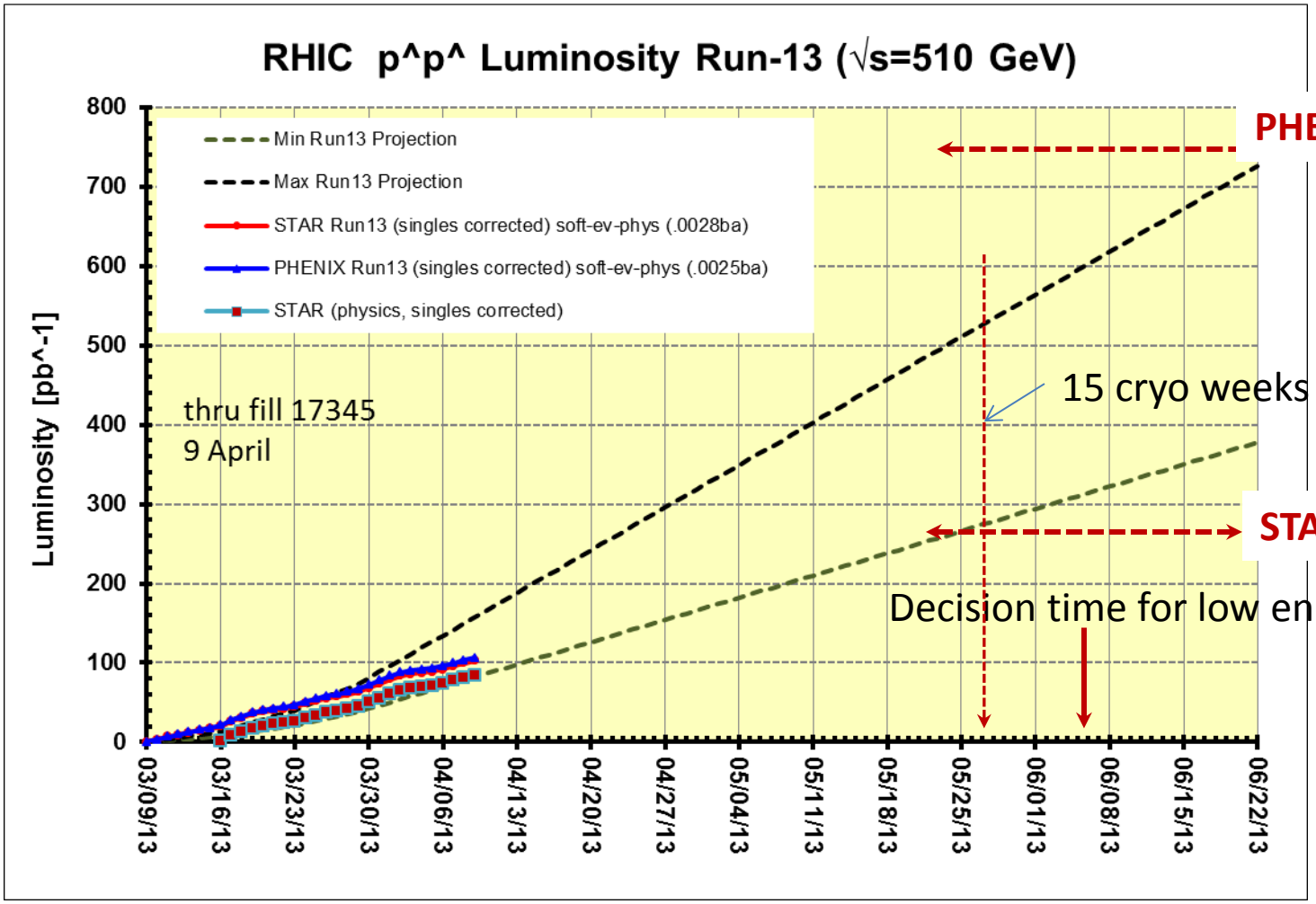
Preliminary, with Run 13 cross sections, PHENIX and STAR ***log based singles correction***



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

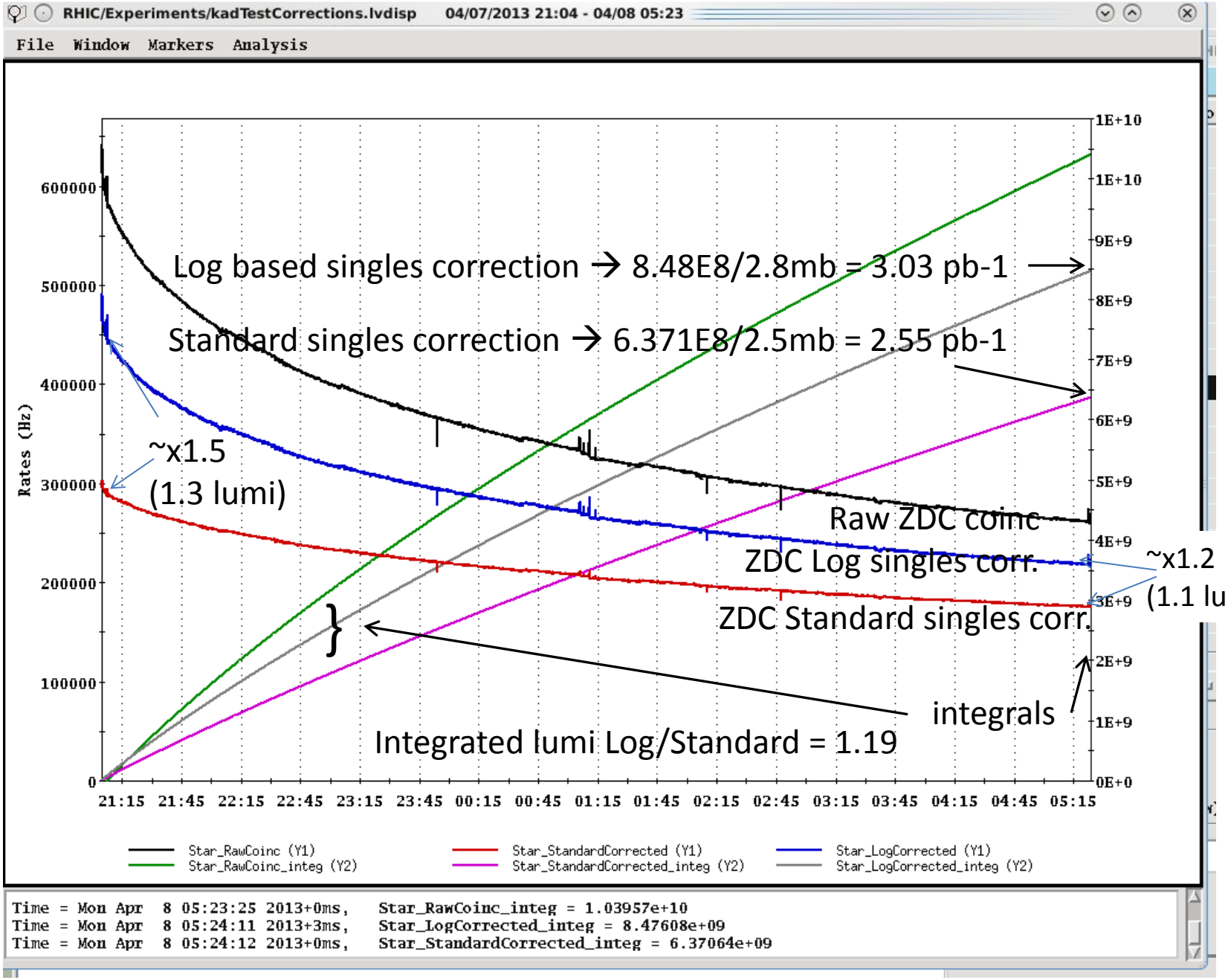
PHENIX Goal, 250 pb^{-1} recorded, 750 pb^{-1} delivered, ≥ 55% polarization

STAR Goal, 165 pb^{-1} recorded, 275 pb^{-1} delivered, ≥ 55% polarization



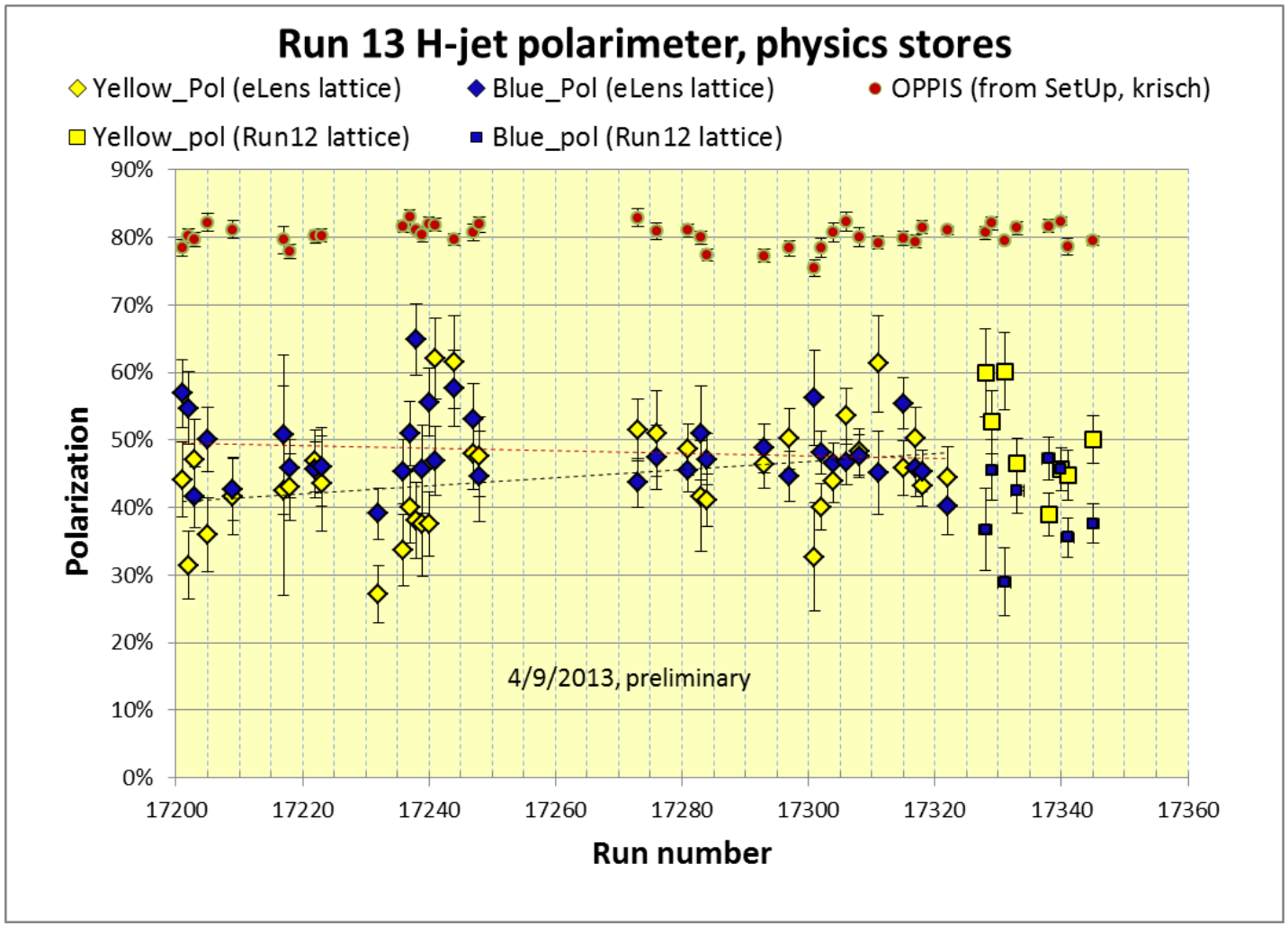
Preliminary, with Run 13 cross sections, singles corrected

Example Store for STAR (17340) with “physics” time cuts



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

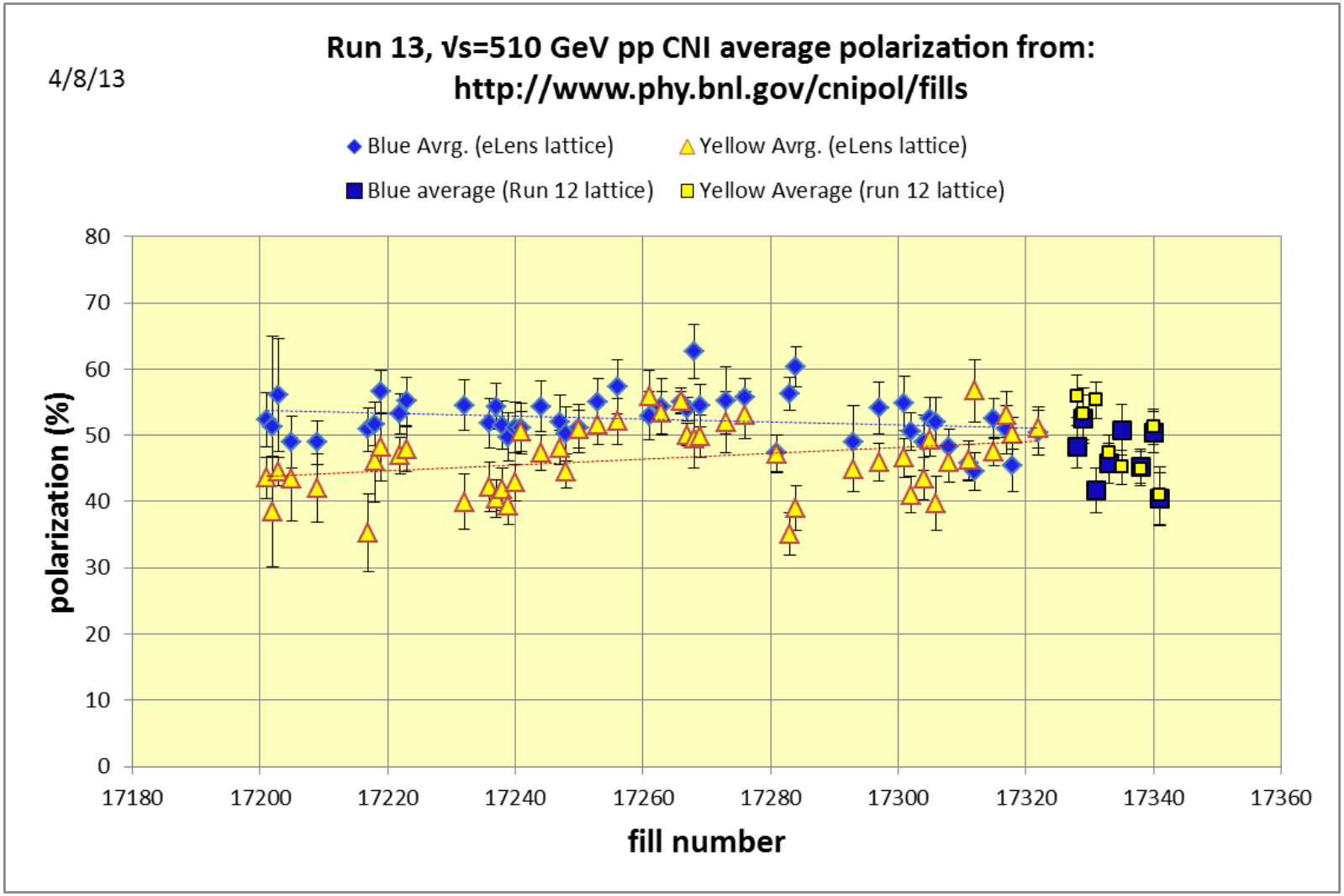
Yellow average = 47.2 ± 1.4%
Blue average = 40.7± 1.2%
stores 17328 – 17345 (Run 12 lattice)

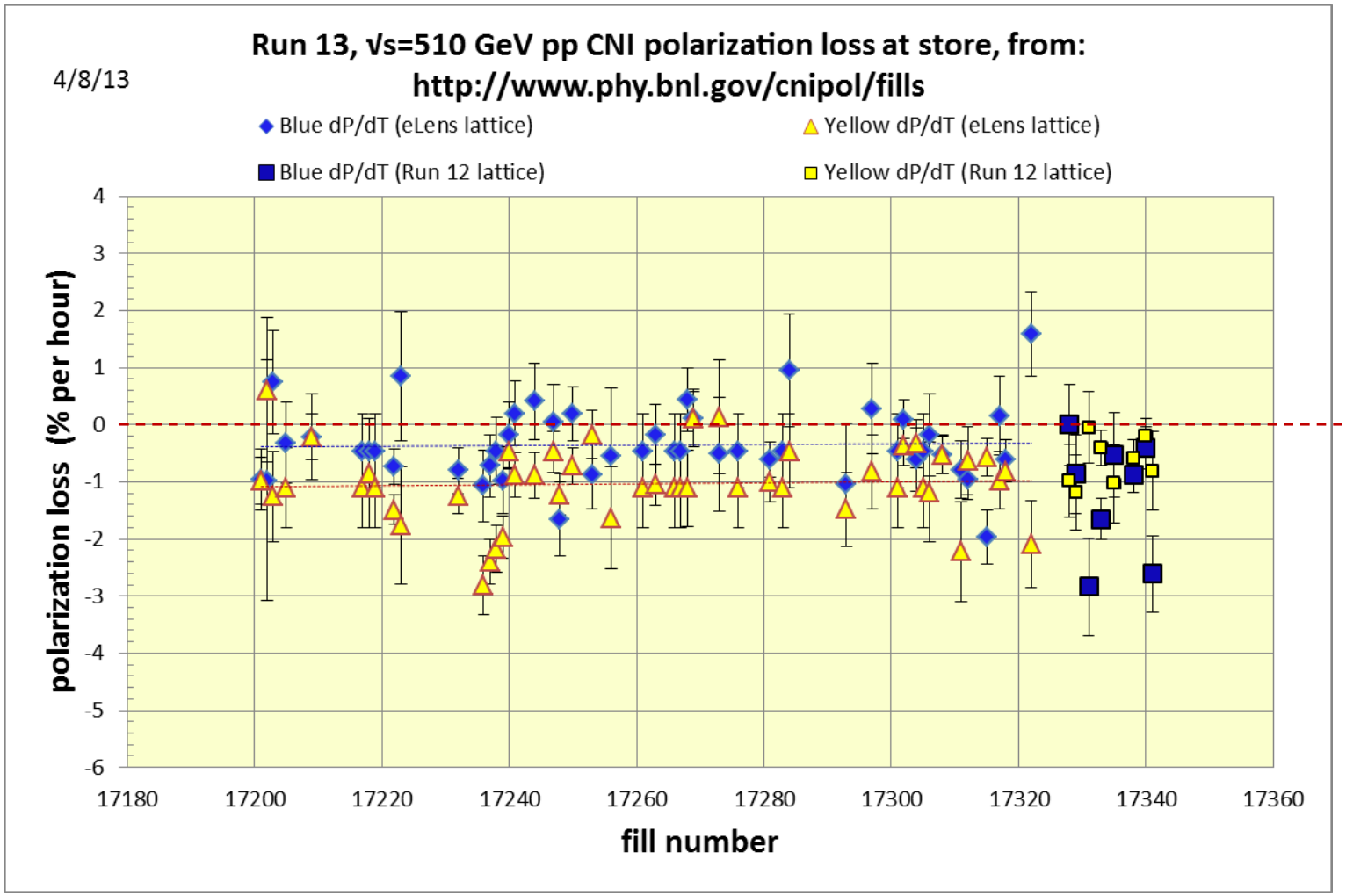


https://wiki.bnl.gov/rhicspin/Polarimetry/H-jet/Run13

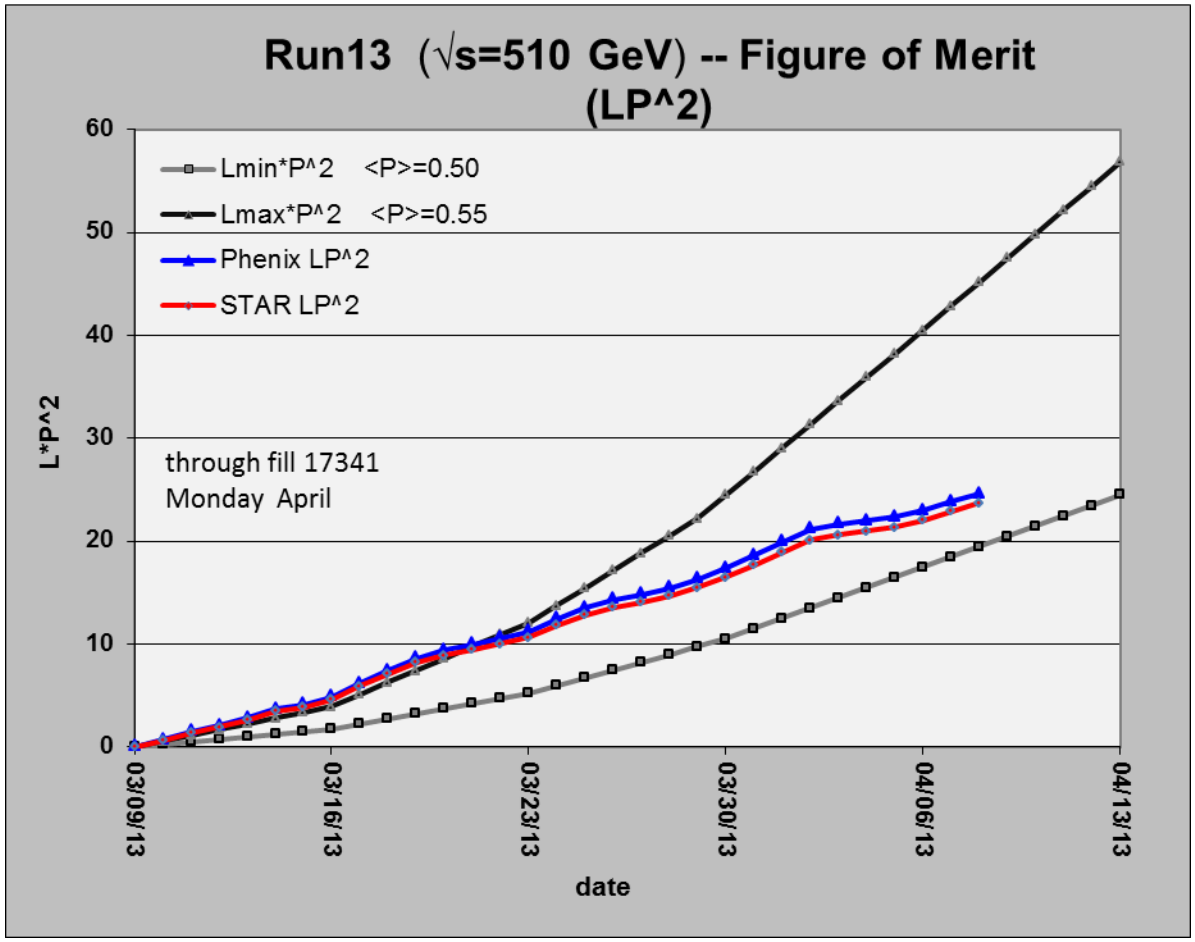
Yellow average = 48.2± 0.4%
Blue average = 53.1 ± 0.5%
Average = 50.7%
stores 17201-17322 (eLens lattice)

Yellow average = 49.3± 1.1%
Blue average = 46.8 ± 1.2%
Average = 48.1%
stores 17328-17341 (Run 12 lattice)



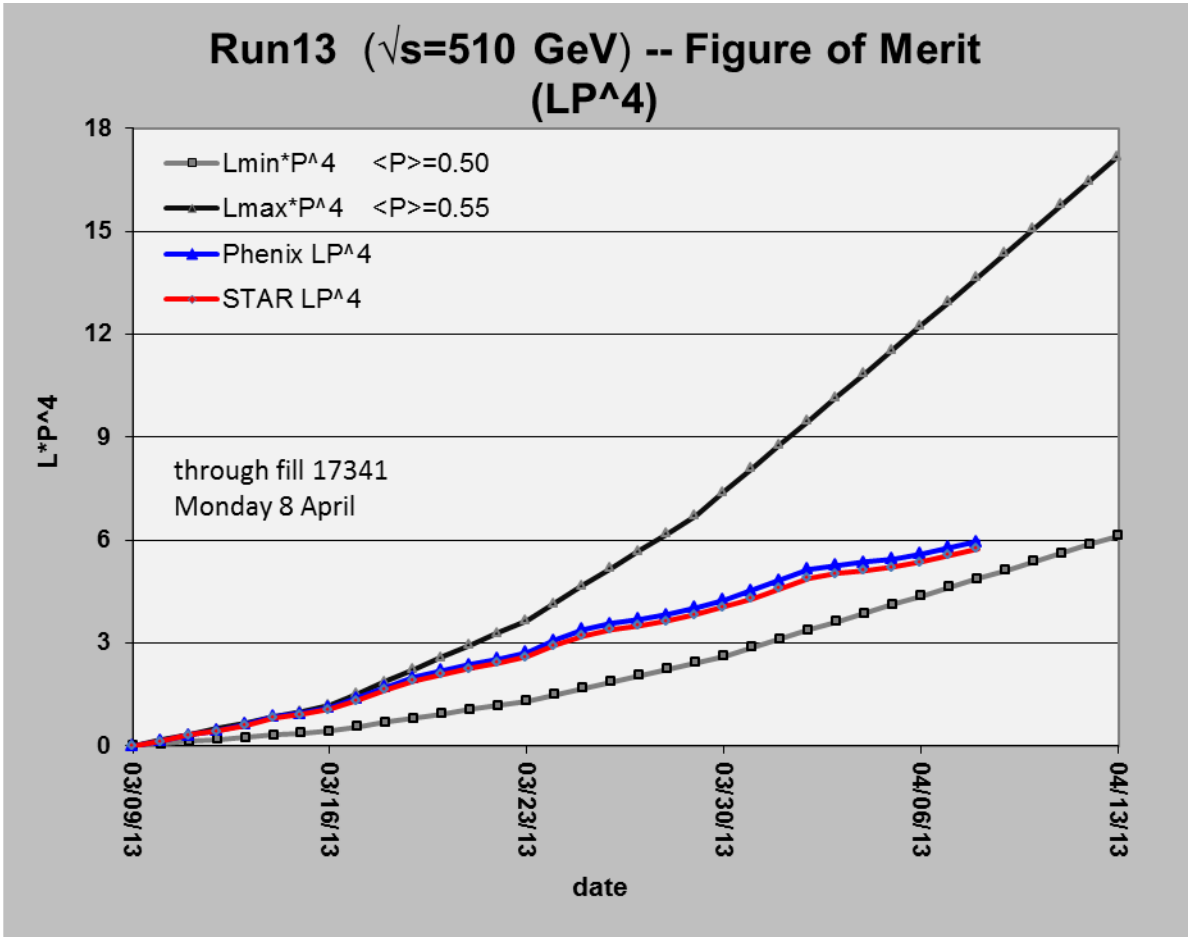

Run 13, √s=510 GeV pp CNI polarization loss at store, from:
http://www.phy.bnl.gov/cnipol/fills
4/8/13
Blue dP/dT (eLens lattice)
Yellow dP/dT (eLens lattice)
Blue dP/dT (Run 12 lattice)
Yellow dP/dT (Run 12 lattice)
polarization loss (% per hour)
4
3
2
1
0
-1
-2
-3
-4
-5
-6
17180
17200
17220
17240
17260
17280
17300
17320
17340
17360
fill number

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/

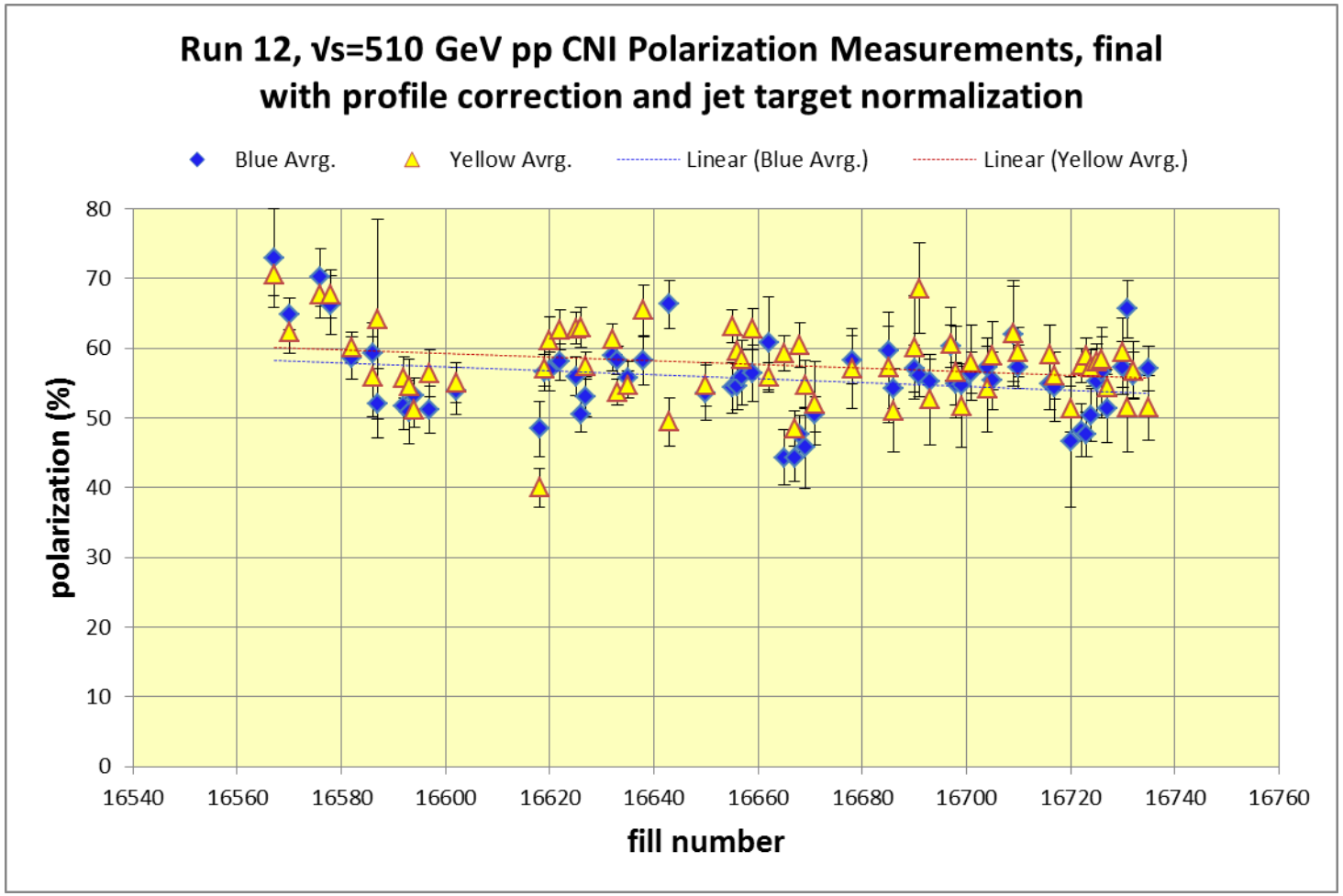
Preliminary, with Run 13 cross sections, PHENIX and STAR ***log based singles correction***



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

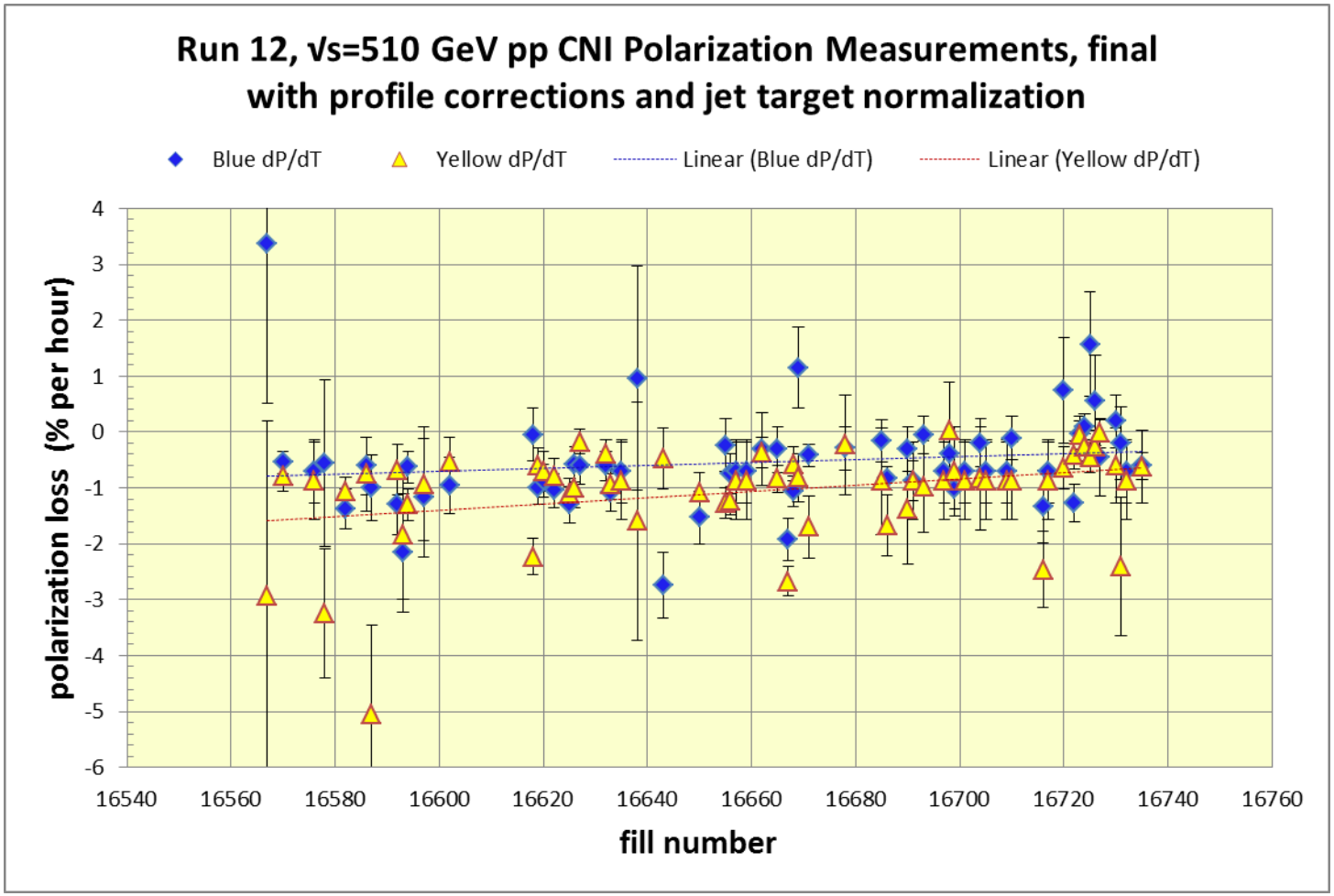
Additional Information

Yellow average = 48.12± 0.4%
Blue average = 53.1 ± 0.5%

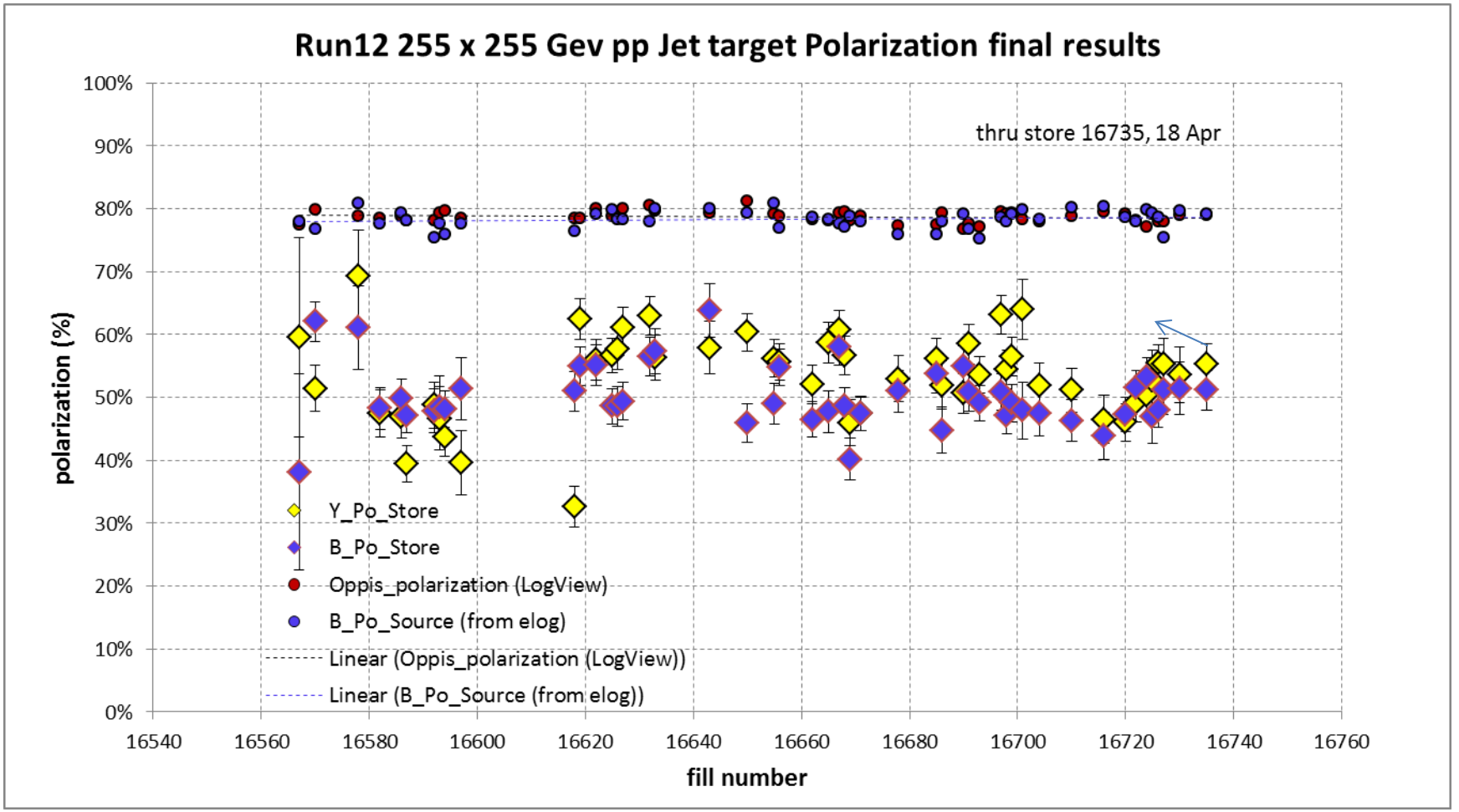


http://www.phy.bnl.gov/cnipol/fills/

Yellow average = 57.7± 0.4%
Blue average = 55.9 ± 0.4%
Average = 56.8%



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

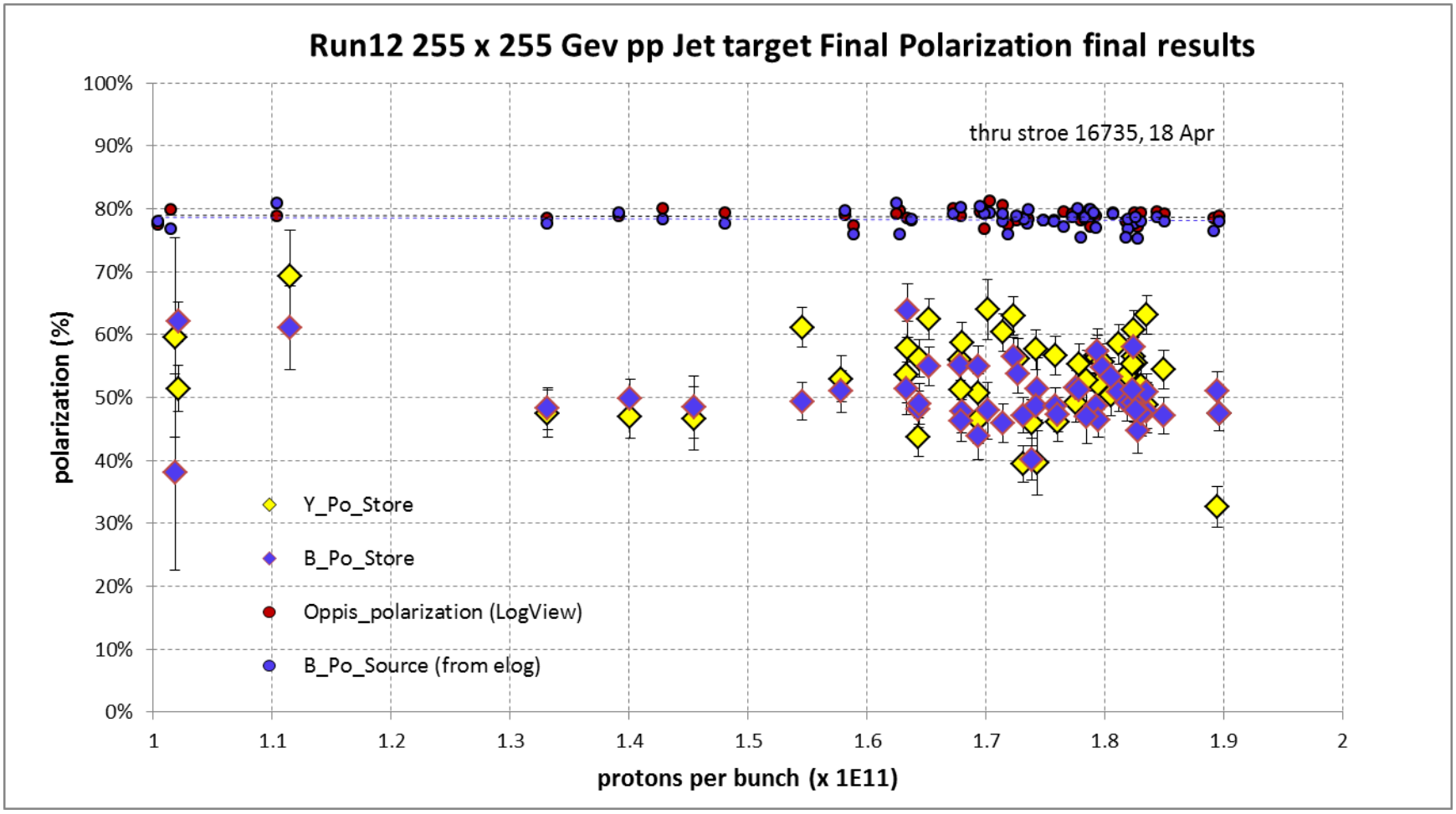


And Yellow beam at injection jet target Run 12 result = 63.0 ± 4.4%

Blue jet target weighted average = 50.3% ± 0.5%

Yellow jet target weighted average = 53.4% ± 0.5%

Yellow average = 53.4 ± 0.5%
Blue average = 50.3 ± 0.5%

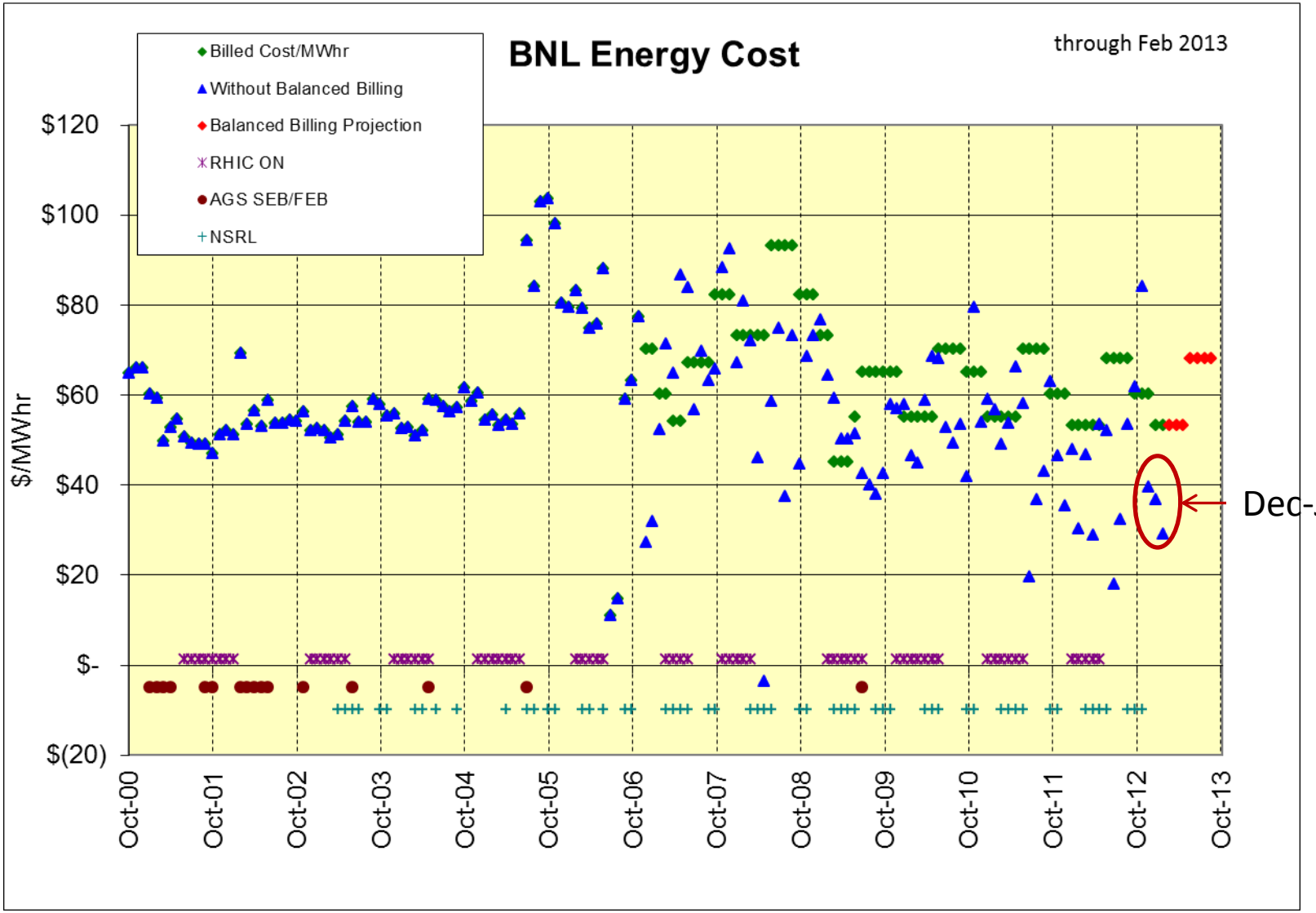


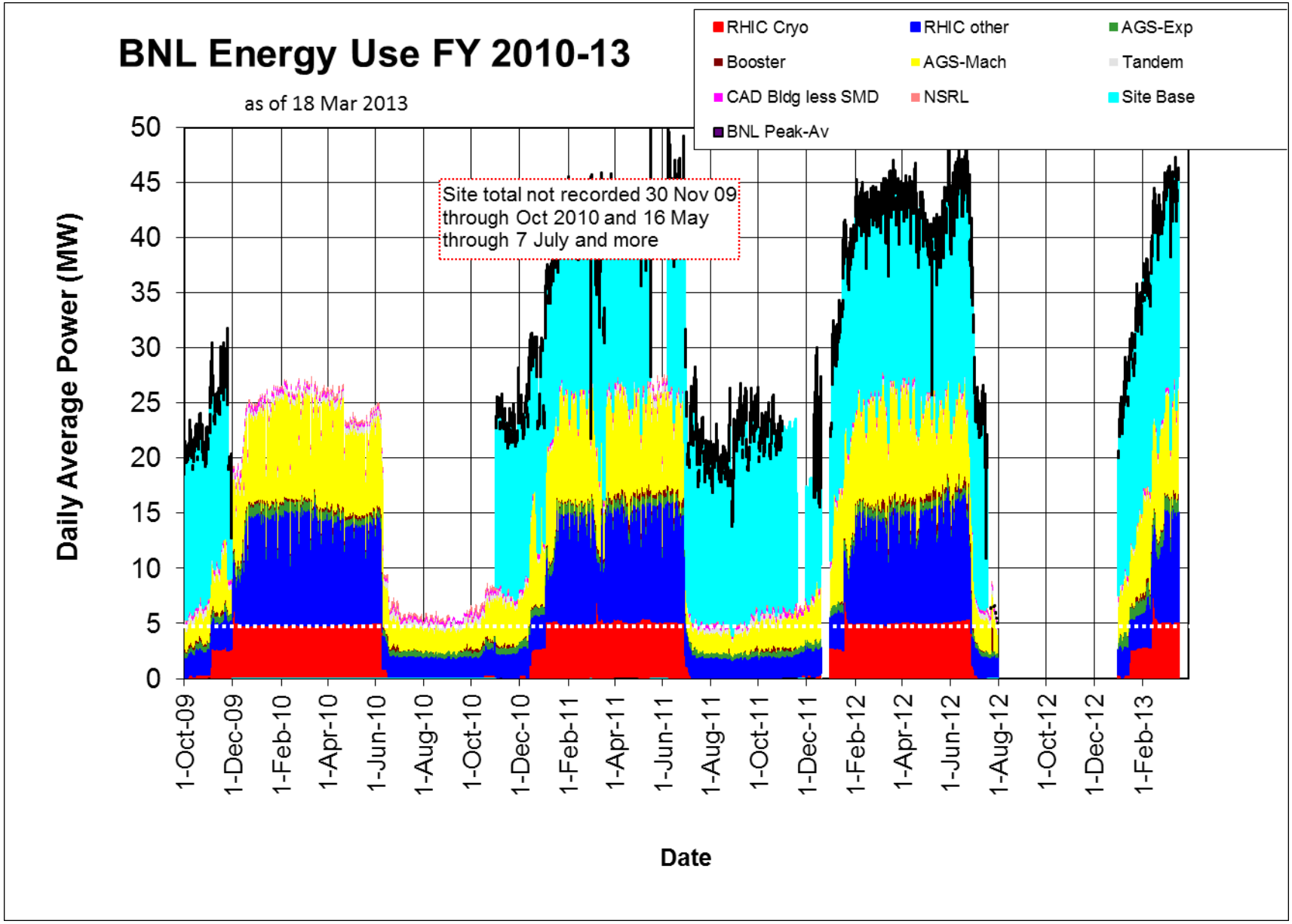
Feb 2013 bill

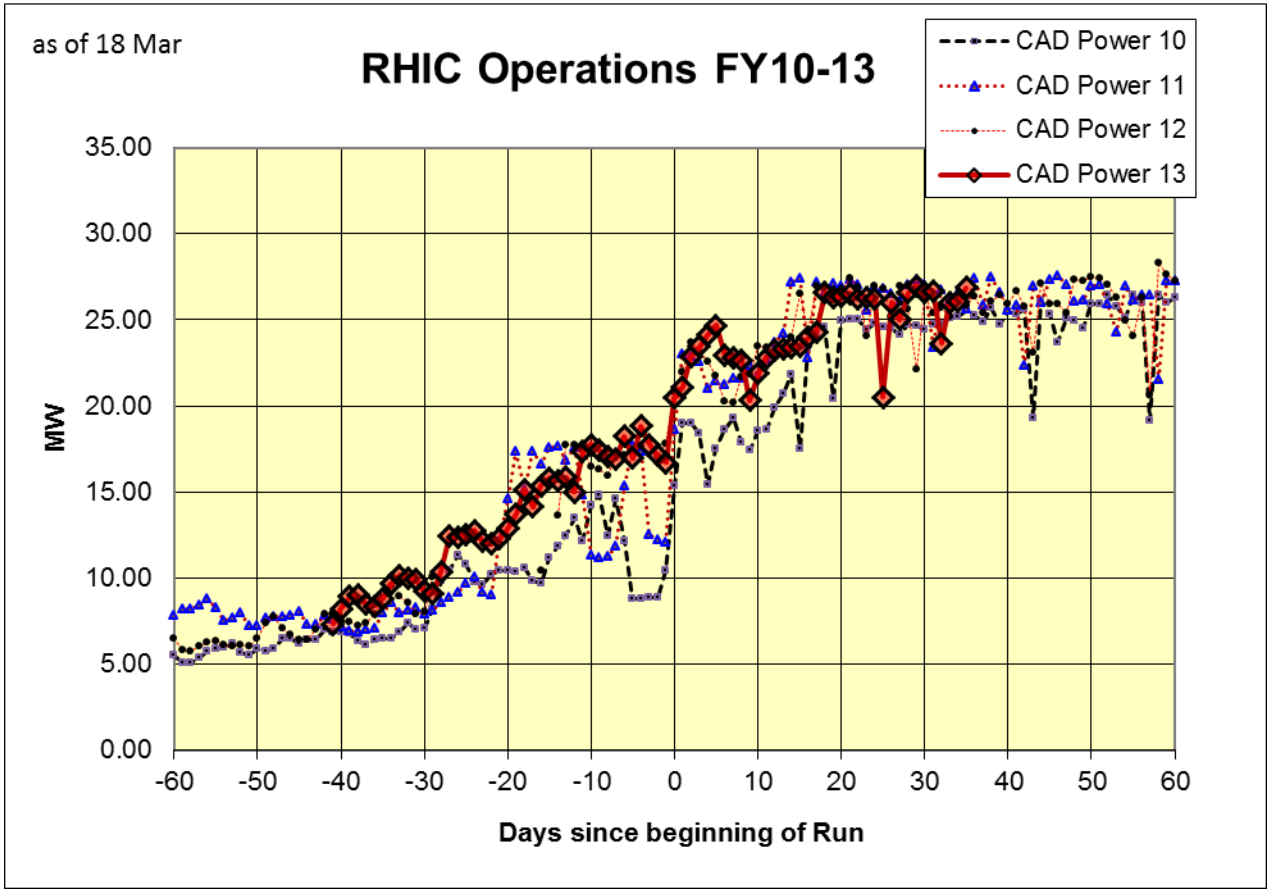
$28.89 actual

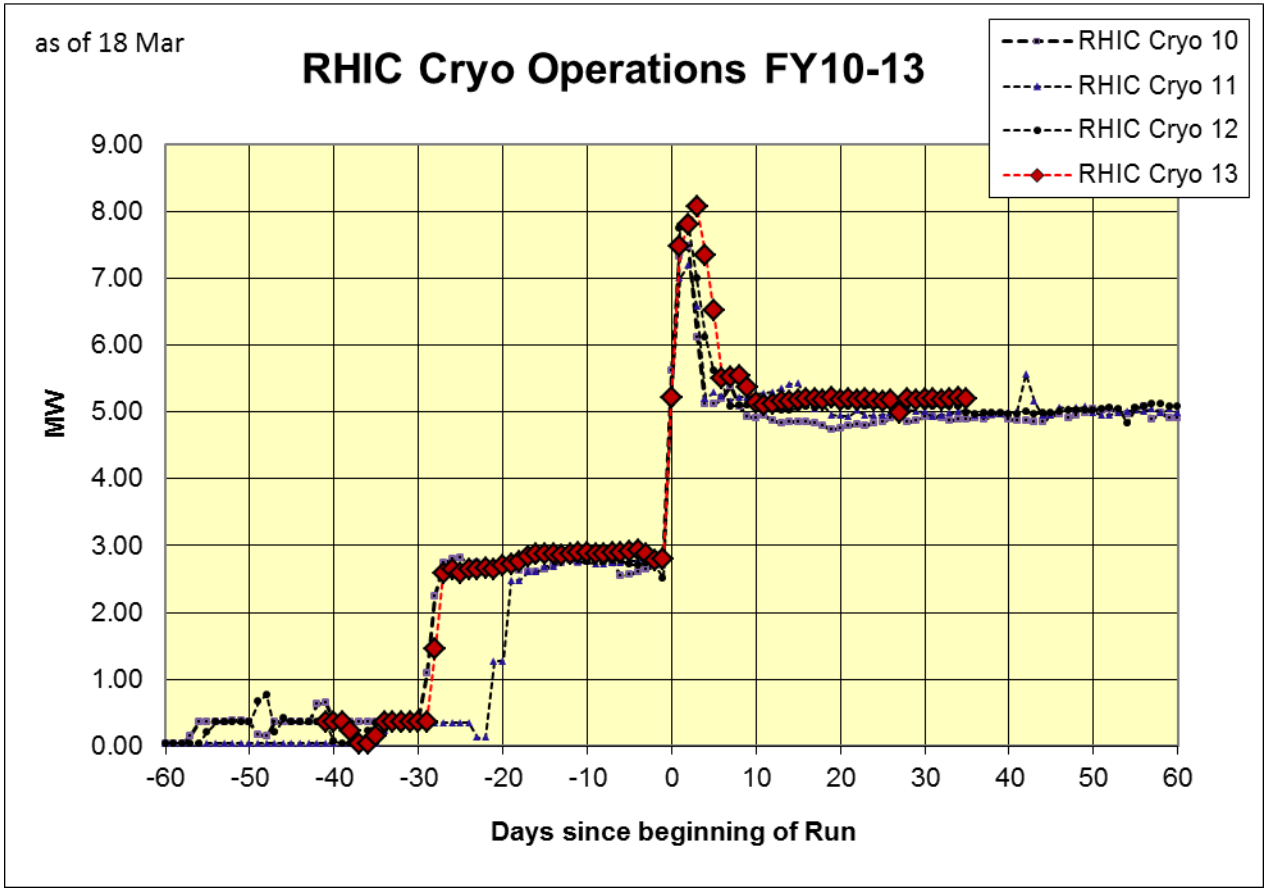
billed at $53/Mwhr

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



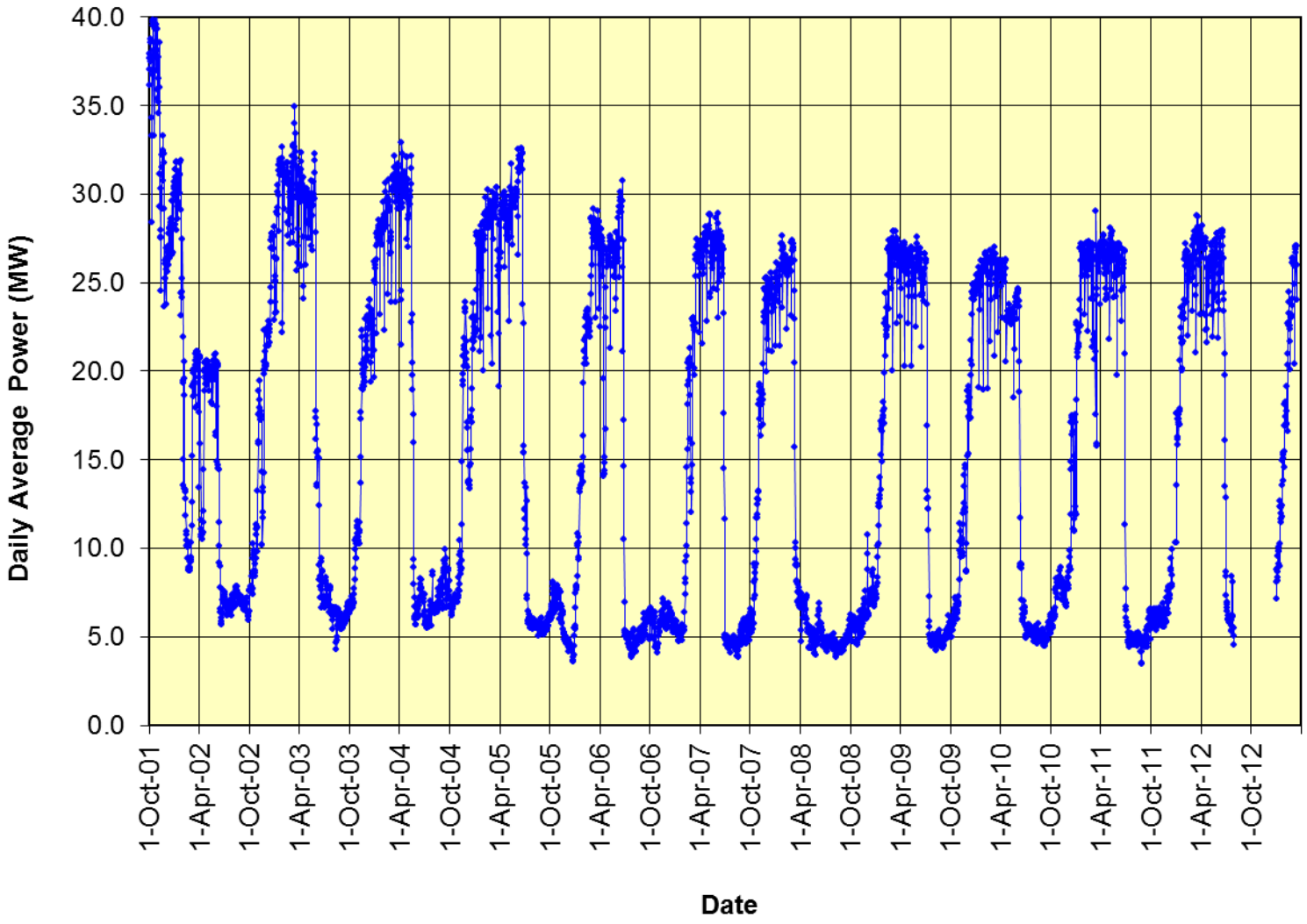

BNL Energy Use FY 2010-13
as of 18 Mar 2013
RHIC Cryo
RHIC other
AGS-Exp
Booster
AGS-Mach
Tandem
CAD Bldg less SMD
NSRL
Site Base
BNL Peak-Av
Site total not recorded 30 Nov 09 through Oct 2010 and 16 May through 7 July and more
Daily Average Power (MW)
0
5
10
15
20
25
30
35
40
45
50
1-Oct-09
1-Dec-09
1-Feb-10
1-Apr-10
1-Jun-10
1-Aug-10
1-Oct-10
1-Dec-10
1-Feb-11
1-Apr-11
1-Jun-11
1-Aug-11
1-Oct-11
1-Dec-11
1-Feb-12
1-Apr-12
1-Jun-12
1-Aug-12
1-Oct-12
1-Dec-12
1-Feb-13
Date

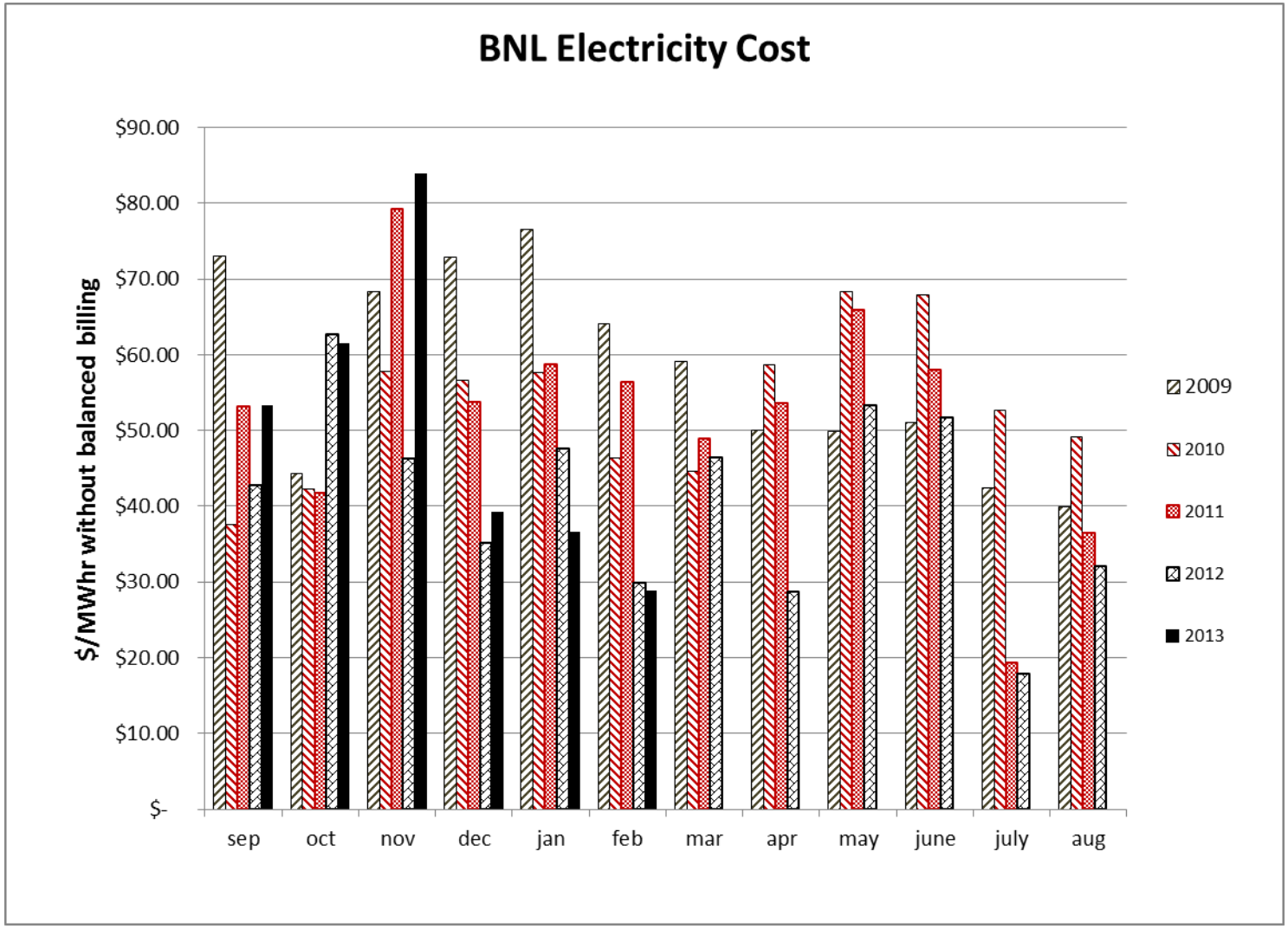

as of 18 Mar
RHIC Operations FY10-13
CAD Power 10
CAD Power 11
CAD Power 12
CAD Power 13
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
MW
-60
-50
-40
-30
-20
-10
0
10
20
30
40
50
60
Days since beginning of Run


as of 18 Mar
RHIC Cryo Operations FY10-13
RHIC Cryo 10
RHIC Cryo 11
RHIC Cryo 12
RHIC Cryo 13
MW
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
-60
-50
-40
-30
-20
-10
0
10
20
30
40
50
60
Days since beginning of Run

as of 18 Mar 2013

C-AD Energy Use FY 2002-13

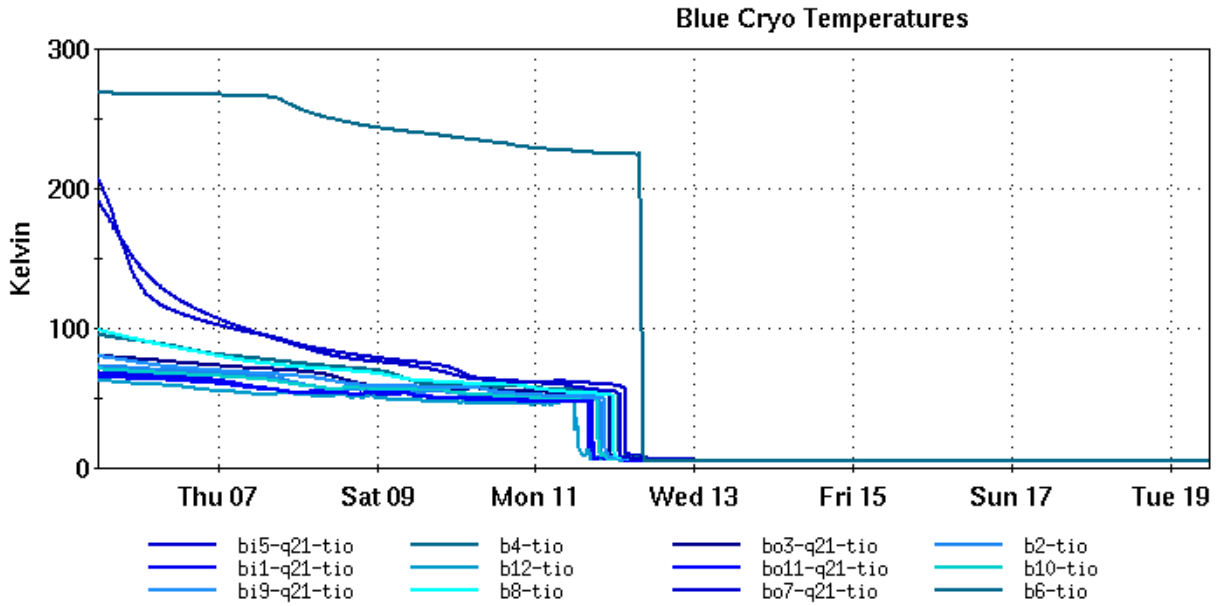


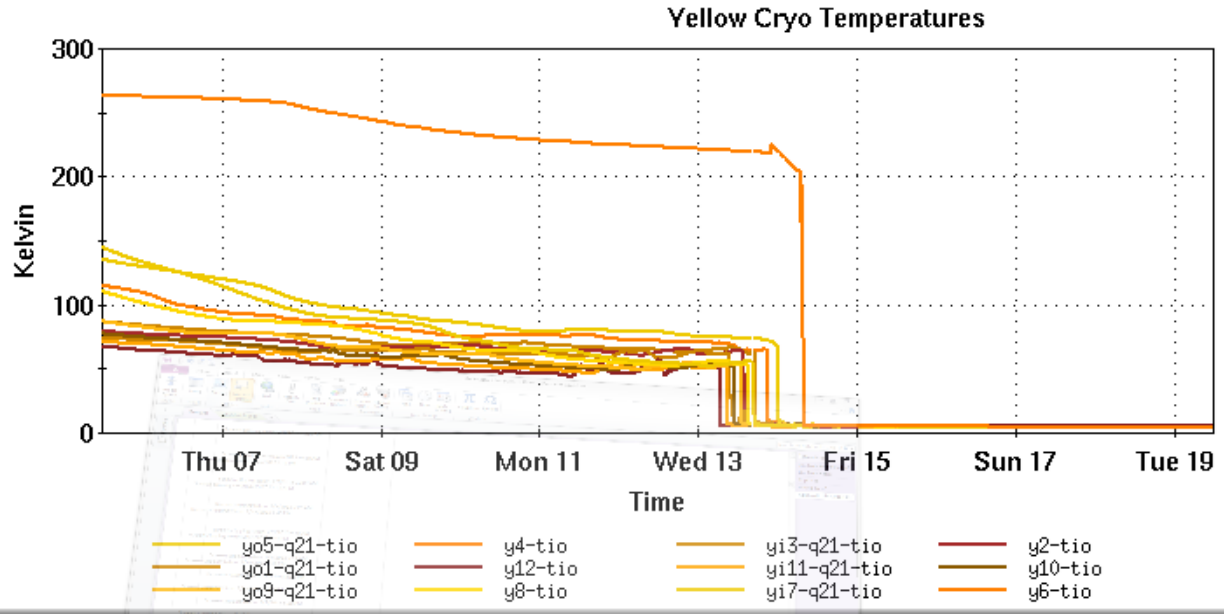

BNL Electricity Cost
$/MWhr without balanced billing
$90.00
$80.00
$70.00
$60.00
$50.00
$40.00
$30.00
$20.00
$10.00
$-
sep
oct
nov
dec
jan
feb
mar
apr
may
june
july
aug
2009
2010
2011
2012
2013

Cryogenic Blue & Yellow Rings (14 days)

Ring Summary (1 day) Sector Plots (1 day) Sector Plots (14 days)

File Window Markers Analysis





http://www.bnl.gov/cad/esfd

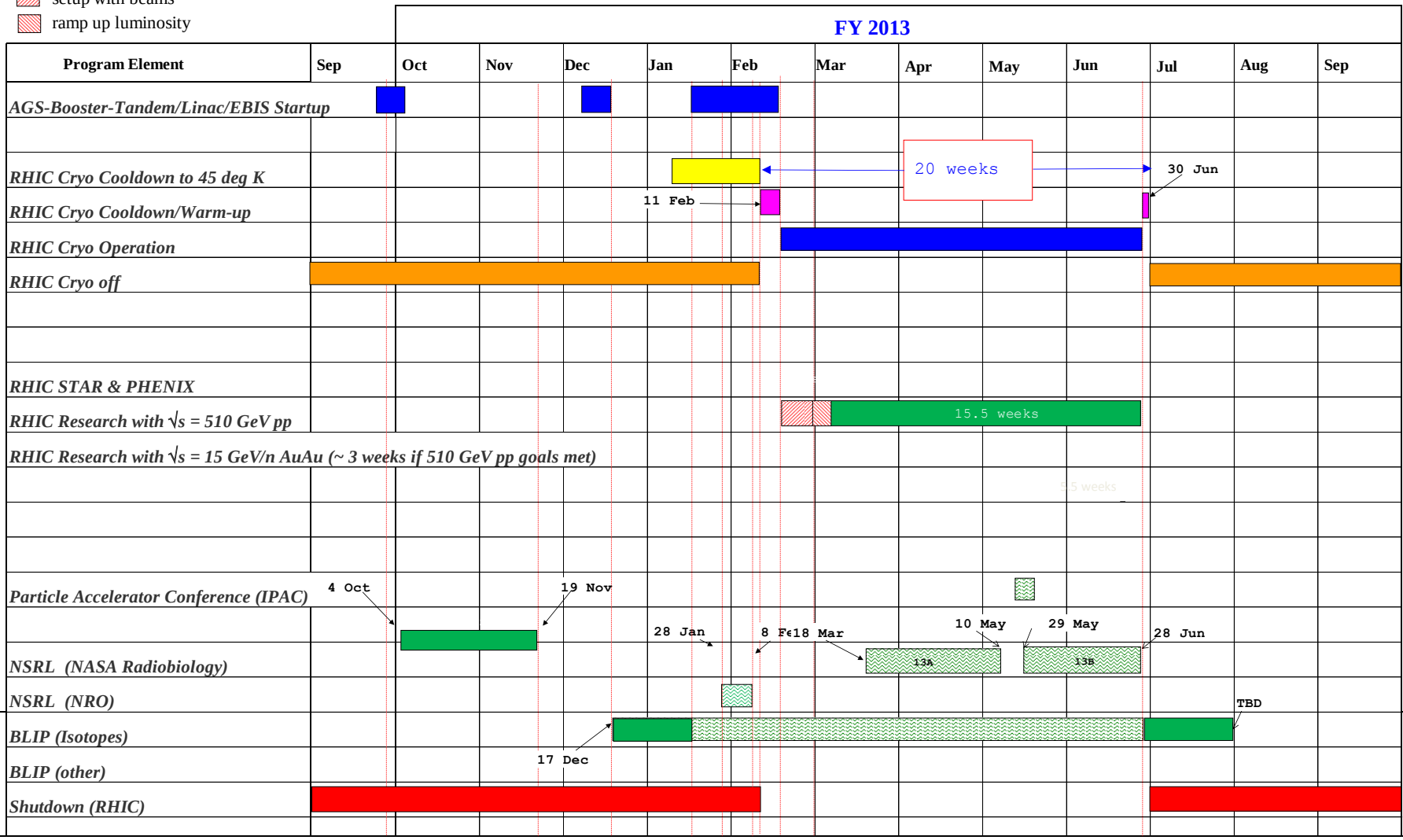
Scheduling Physicist: Andrei Poblaguev

C-A Operations-FY13

27 Mar 13

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 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.