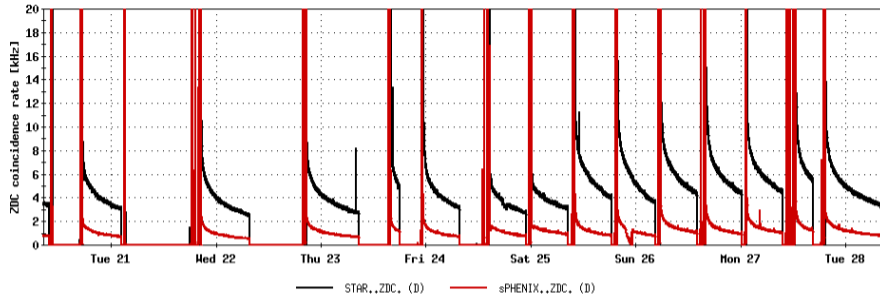


RHIC Status

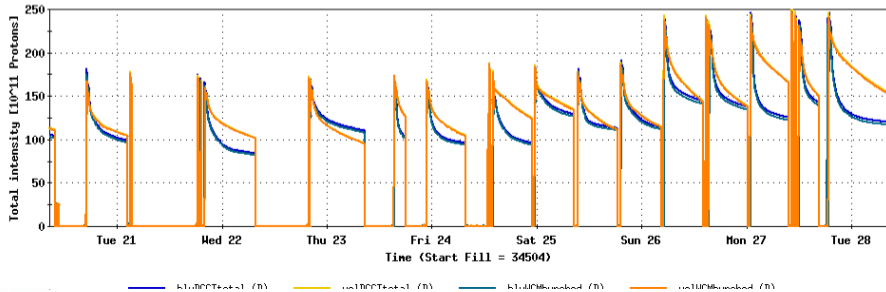
Kiel Hock

May 28, 2024

Last Week at RHIC



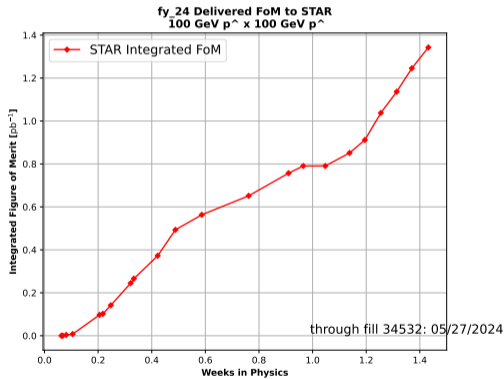
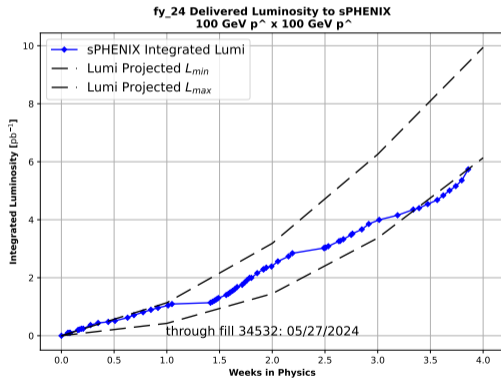
RHIC Beam Intensity



RHIC status and Lumi Projections

/ 111x111 physics running since 4/30.

Preliminary luminosity accounting



RHIC Status

- ! Rotator ramp implemented for STAR on 5/17, used since 5/20
 - ! Current scans lead to QLIs due to proximity of currents to upper limit
 - ! Final solution arrived from taking Run15 longitudinal settings and extrapolating them to transverse used since 5/24
- ! IR12 DX magnet needed a QPA and Regulator Card swap on 5/21
- ! Physics ran with reduced number of bunches for ecloud suppression (going theory at the time) but suppressed the HOM excitation in the 56 MHz SRF cavity.
 - ! Implemented 68x68, 74x74, 78x78, 84x84 fill patterns with specific bunch spacing to mitigate ecloud
 - ! FPC inserted which lead coupling of HOMs to FMs and lower emittance growth on ramp
- ! Yellow began filling before blue on 5/22
- ! IR4 bump flipped and back to nominal on 5/27
- ! Ramp with cogging to IP4 saw no effect
- ! Octupoles reduced from 8 to 3 on 5/26
- ! Maintenance day on 5/22
- ! APEX this week rescheduled for next week.

RHIC Status, II

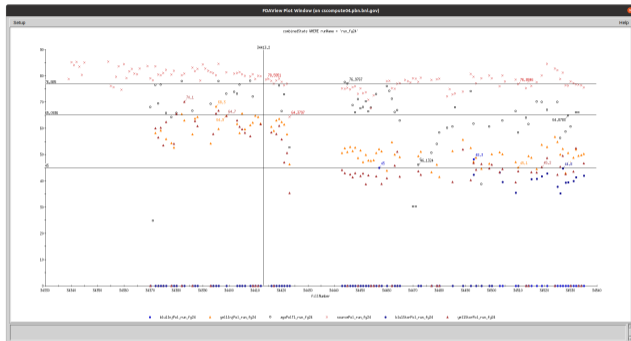
- / Two severe weather standdowns
- / Machine Development this week to try and improve the store
 - / Insert 56 MHz FPC more to try and further reduce HOM excitation and improve emittance growth
 - / Revert to early run and optimize setup with a more nominal configuration (tune bridge, octupoles, etc)
 - / Revisit collimation
- / AGS Cold Snake tripped from this morning
 - / Cannot be powered
 - / Helium reserves at 3%, more on order
- / H-jet turbo pump down
 - / one of two turbos down
 - / May not run well in this state
 - / 5-6 hour access required for repair

Polarization Performance and Improvement Efforts

AGS (see Vincent's slides from time meeting for in-depth details) polarization routine

- / Check y at strong intrinsic resonances
- / Check polarization with jump quads on vs off
- / Review recent changes and verify polarization unaffected
- / Timing scan of jump quads
- / Recalculate jump quad timings
- / Verify harmonic scans in Booster are unchanged

Polarization Performance and Improvement Efforts



RHIC

- / Can effectively observe one change/store
- / Large emittances

Improvement Efforts

- / 56 MHz to address emittance growth
- / reinstall tune bridge
- / Spin Flipper to measure s ?

Physics Checkpoints

- squeeze at IP8
- 1.0e11 protons per bunch @physics
- complete low-luminosity run for STAR
- sPHENIX running with nominal store conditions
- 1.7e11 protons per bunch @physics (Run12 maximum)
- 2.0e11 protons per bunch @physics
- 2.4e11 protons per bunch @physics (Run15 maximum)
- 2.4e11 protons per bunch and 60% polarization @physics (Run15 maximum)
- switch to alternate AGS setup
- 2.5e11 protons per bunch @physics
- 3.0e11 protons per bunch @physics