Brookhaven National Laboratory

U.S. DEPARTMENT OF ENERGY

RHIC Status

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May 28, 2024

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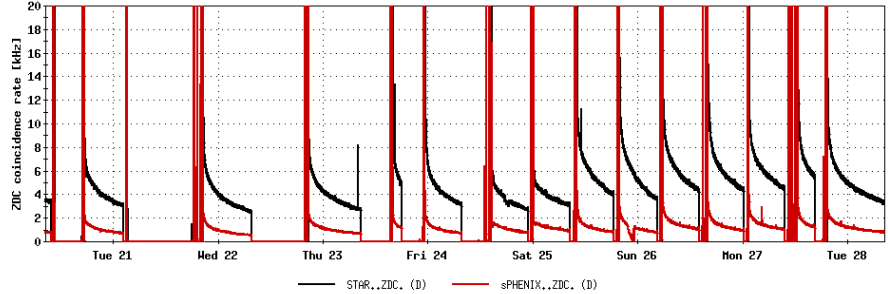
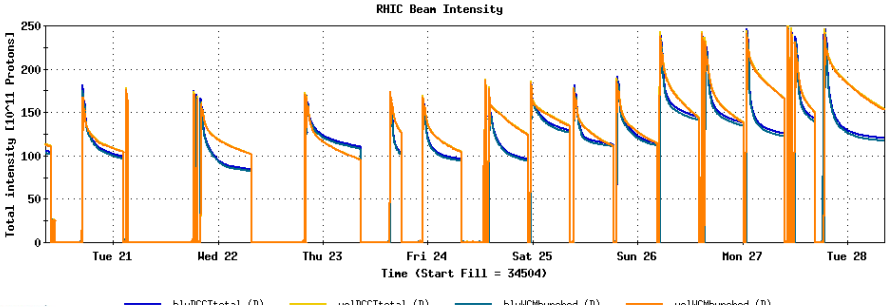
Last Week at RHIC

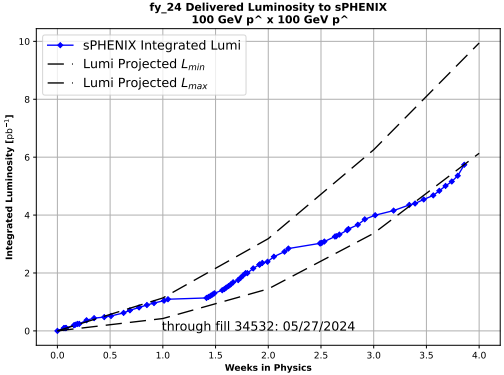


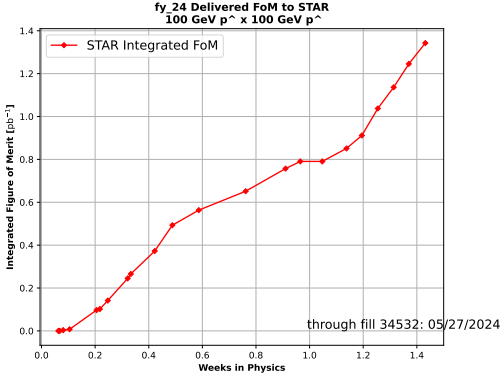


RHIC status and Lumi Projections

→ 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

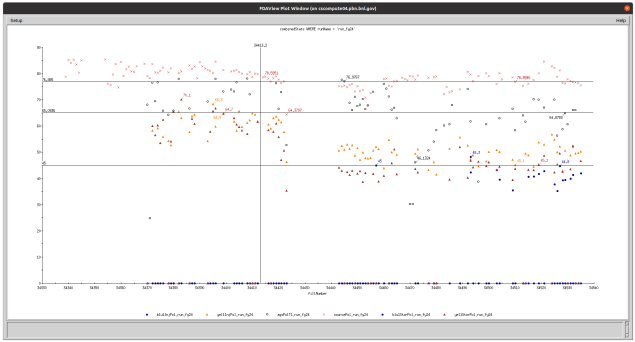
- → Two severe weather standdowns
- → Machine Development this week to try and improve the store
  - → Insert 56 MHz FPC more to try and further reduce HOM excitation and improve emittance growth
  - → Revert to early run and optimize setup with a more nominal configuration (tune bridge, octupoles, etc)
  - → 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

- $\rightarrow$ Check ν_y at strong intrinsic resonances
- $\rightarrow$ Check polarization with jump quads on vs off
- $\rightarrow$ Review recent changes and verify polarization unaffected
- $\rightarrow$ Timing scan of jump quads
- $\rightarrow$ Recalculate jump quad timings
- $\rightarrow$ 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 ν_s?

Physics Checkpoints

- ☐ β 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