

RHIC Run24 Preparations

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Table of Contents

PAC Recommendations

Run24 Schedule

RHIC Run Preparations

Injector Preparations to Support RHIC

Overview of Major Works

PAC Recommendations

The PAC Recommendations are available here. In summary:

The PAC considers at least 28 weeks (+6 in 2024) of cryo operation each for Runs 24 and 25 as a minimal run scenario that can provide sPHENIX the opportunity to achieve insights into the microscopic structure of the quark-gluon plasma created at RHIC and completion of the RHIC science mission.

The PAC recommends that the top priority for Run 24 is to complete the commissioning of sPHENIX and to collect the high statistics pp dataset necessary as a reference for all the sPHENIX hard probes Au+Au measurements in Run 25, and simultaneously allow STAR to make landmark polarized proton measurements using its new forward instrumentation.

We recommend p+Au running in Run 24 if, and only if, the top priority above has been completed and a p+Au run of at least 5 weeks can be accomplished.

Run24 Schedule

Questions determining the schedule:

PP or AuAu first?

- | pp first would allow full commissioning of the 56 MHz system in preparation for Run25.
- | Au first would allow more time for commissioning of AGS skew quads.

Valve box repair

Overview of Major Works

Valve box repair (Michiko's talk)

Blue snake reinstall

- | Rewiring this week
- | Plumbing in cryo 2 weeks
- | PS testing sequence being worked on to optimize work sharing with Valve Box
- | On schedule to be reinstalled and warm tested.

Diode removal and testing. New diode installed and being sealed (pressure test in several weeks, on schedule).

Upgrade of IR8 D0 PS to support 2 mrad crossing angle at sPHENIX if pAu occurs (1 mrad currently supported).

RHIC Run Preparations

Lattice development is underway with zero DX shifts (GRD).

Beam-beam effects with crossing angle simulations (X. Gu and Y. Luo).

- | Preliminary results show significant tune shift suppression from crossing angles.

Dynamic aperture simulations with crossing angle simulations (X. Gu and Y. Luo).

OPPIS being run this week to check for any system failures ahead of LINAC shutdown.

Injector Preparations to Support RHIC

How to get 3×10^{11} protons/bunch at store?

Two possible scenarios for achieving this

- | Take two pulses from OPPIS with a nominal injector configuration, merging at AGS flattop (long merge, bunch will be 40% longer, excess intensity can afford longitudinal scraping), polarization should be approximately the same as the current configuration.
- | Take a longer pulse from OPPIS, perform a bunch split in Booster, merge at AGS flattop.
- | Either scenario will have the goal of 3.5×10^{11} protons/bunch at AGS extraction.

Skew quads provide an absolute correction of resonances which will improved polarization

- | 10 magnets installed, 3 magnets measured and waiting for install, final two magnets to be delivered this week
- | PS testing is ongoing, delivery TBD.

How long will it take to reach?

2 weeks of setup, from first injections to 1:1 10^{11} physics

4 weeks of intensity ramp up to 2:1 10^{11}

| 2-4 weeks (expected) of intensity ramp up to 3:0 10^{11}