Brookhaven National Laboratory

U.S. DEPARTMENT OF ENERGY

RHIC Run24 Preparations

Kiel Hock

March 26, 2024

@BrookhavenLab

RHIC schedule

Key dates	Event
January 8, 2024	Booster on for NSRL
Week of February 20, 2024	Complete AGS Checkout
February 29, 2024	AGS setup Began
March 27, 2024	approximate cold snake ready
March 29, 2024	approximate OPPIS ready
April 1, through April 5, 2024	RHIC dry run
April 15, 2024 through October 7, 2024	RHIC run (25 weeks)

RHIC startup schedule is here, by T. Shrey.
RHIC run schedule is here, by C. Giorgio.
RHIC run webpage is here, by K. Hock.

AGS status

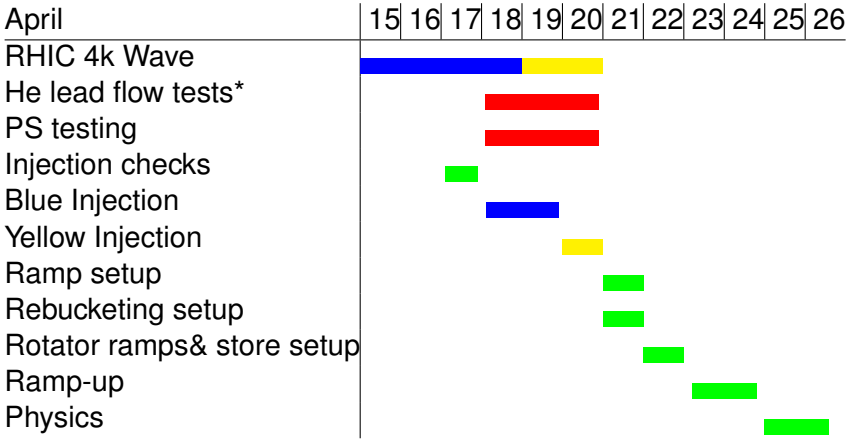
AGS setup status:

- Cold snake expected on March 21st.
- Standard setup with unpolarized beams completed, 1.8 10^{11} at AGS extraction,
- Setup of split+merge has been established,
- Setup of 2 LINAC pulses+merge has been established,
- Skew quad setup occurs concurrently.

Skew quad commissioning status:

- All magnets installed,
- 6 PS installed with 3 more available and 4 more on site to be tested (13 of 15),
- Verification of skew quad installation being performed with beam,
- Simulations indicate 9 skew quads can be competitive with jump quad setup.

RHIC Startup Schedule



*Meeting this Thursday, March 28th, to discuss.

Ramp setup cannot occur before He lead flow tests are complete

Post Physics

Priorities post physics

- Ramp-up intensity weeks 1-10
- Commission squeeze ramp Week 1
- Vernier scan when needed by STAR/sPHENIX
- 56 MHz commissioning (next slide)

Weeks in Physics	1	2	3	4	5	6	7	8	9
Target Intensity/bunch(10^{11})	1.2	1.6	1.79	1.9	2.2	2.4	2.6	2.8	3.0

Notes:

- After week 5, nominal AGS setup can no longer reach intensity goals, switch to most promising AGS merge setup.
- Continue to increase intensity until instabilities are observed, commission bunch-by-bunch dampers.

56 MHz Commissioning

details from F. Severino

After the cavity has been at 4.5 K for 48 hours we need 8 hours to turn the cavity on, condition up to the maximum field level of 1.1. MV and test all of the subsystems (tuner, 2x FPCs and the fundamental mode damper.

After the above RF group needs 2 non-consecutive shifts to characterize the 56 MHz cavity higher order modes.

- RF group has many tasks and may not be free for any random shift chosen for this work.

We need 2-3 days after the above finish before we can even think to start operations with beam. This time is needed to plan the coupled tuning/damping algorithm for bringing the fully damped cavity to the beam driven state.

With beam we need several shifts, 1-4 (not just a few random RHIC fills), to longitudinally trap the RHIC beams with the appropriate 56 MHz LLRF field phase and amplitude control parameters.