

RHIC status

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RHIC status

- The physics goal (160 M) at beam energy 4.6 GeV was achieved today (Sep. 01), the accumulated good event rate is 161.84 M.
- RHIC is switching to setup at 3.85 GeV with LEReC cooling to get a baseline for next year operation, CeC beam commissioning and other tests.

RHIC stores at 4.6 GeV beam energy

- LEReC cooling throughout the operation at 4.6 GeV.
- COVID-19 pause from Mar. 20 to Jun. 16.



Operation configuration at beam energy 4.59 GeV

- LEReC average current was ~ 18 mA. It was available for the most majority of RHIC stores. It improved the average rate by 60-80%.
- Executing two Beta squeezes (the beta star from 4.5 m to 3.5 m, and 3.5 m to 3m), one at 15 minutes into stores, the second at 30 minutes into stores.
- Bunch merge scheme $4 \rightarrow 1$ in AGS. Beam intensity in RHIC with EBIS was $\sim 150E9$ ions per ring.
- Store length was 30 minutes without cooling, 40 minutes with cooling.
- Operating RHIC at lower tunes (~ 0.12) maintained STAR trigger rate when cooling was off.
- RHIC 9 MHz cavities total voltage 180 kV. The tunes with cooling was ~ 0.23 .

Goals for the next two weeks

- Get RHIC setup and LEReC setup at 3.85 GeV, establish a baseline for next year operation.
- Allocate enough time for CeC commissioning and equipment testing.

Plans for 3.85 GeV setup

- Access for RF tuning. $h=123$ for 9 MHz cavities, $h=369$ for 28 MHz cavities. The corresponding frequencies are 9.332 MHz and 27.996 MHz.
- RHIC setup with EBIS beam.
- STAR detector tuning.
- RHIC setup with Tandem beam.
- Run a few stores with EBIS and Tandem beam for comparison, up to the point a decision can be made between the two.
- Bring up 28 MHz cavities, play with the voltage to optimize beam lifetime. Space charge becomes more severe with high voltage, however, IBS effect reduces.
- Up to now, the tunes are at ~ 0.23 . Explore lower tunes at ~ 0.12 .
- Run stores with the chosen configuration.