RHIC status

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Time meeting

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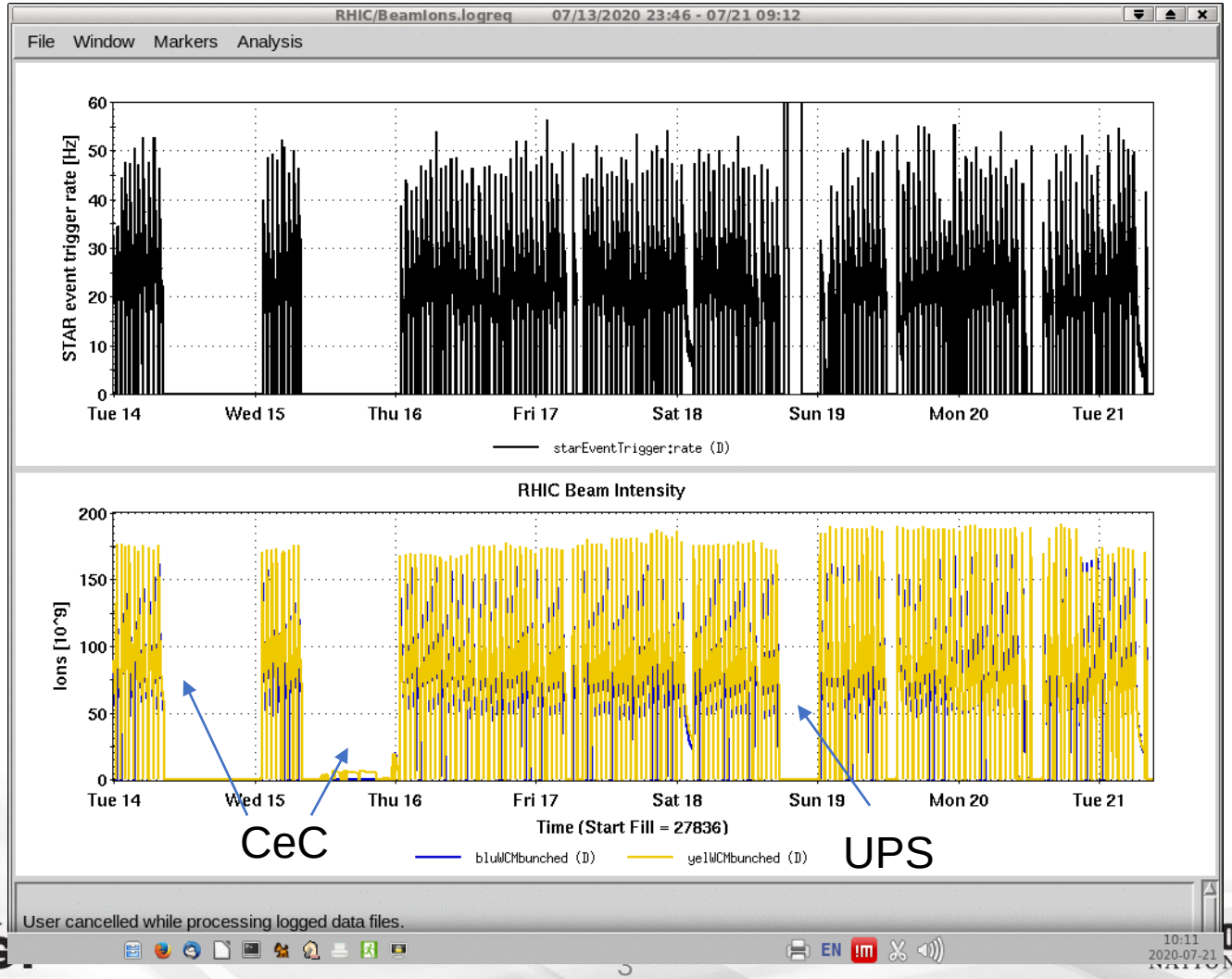
U.S. DEPARTMENT OF ENERGY

RHIC status overview

- RHIC has been providing high performance physics stores over last week, even with the challenge of high temperature.
- LEReC cooling continues with robust performance and high up-time.
- CeC beam commissioning continues with ion beam which was ramped to the design energy last week.

RHIC stores of last week



Fine-tuning of RHIC stores

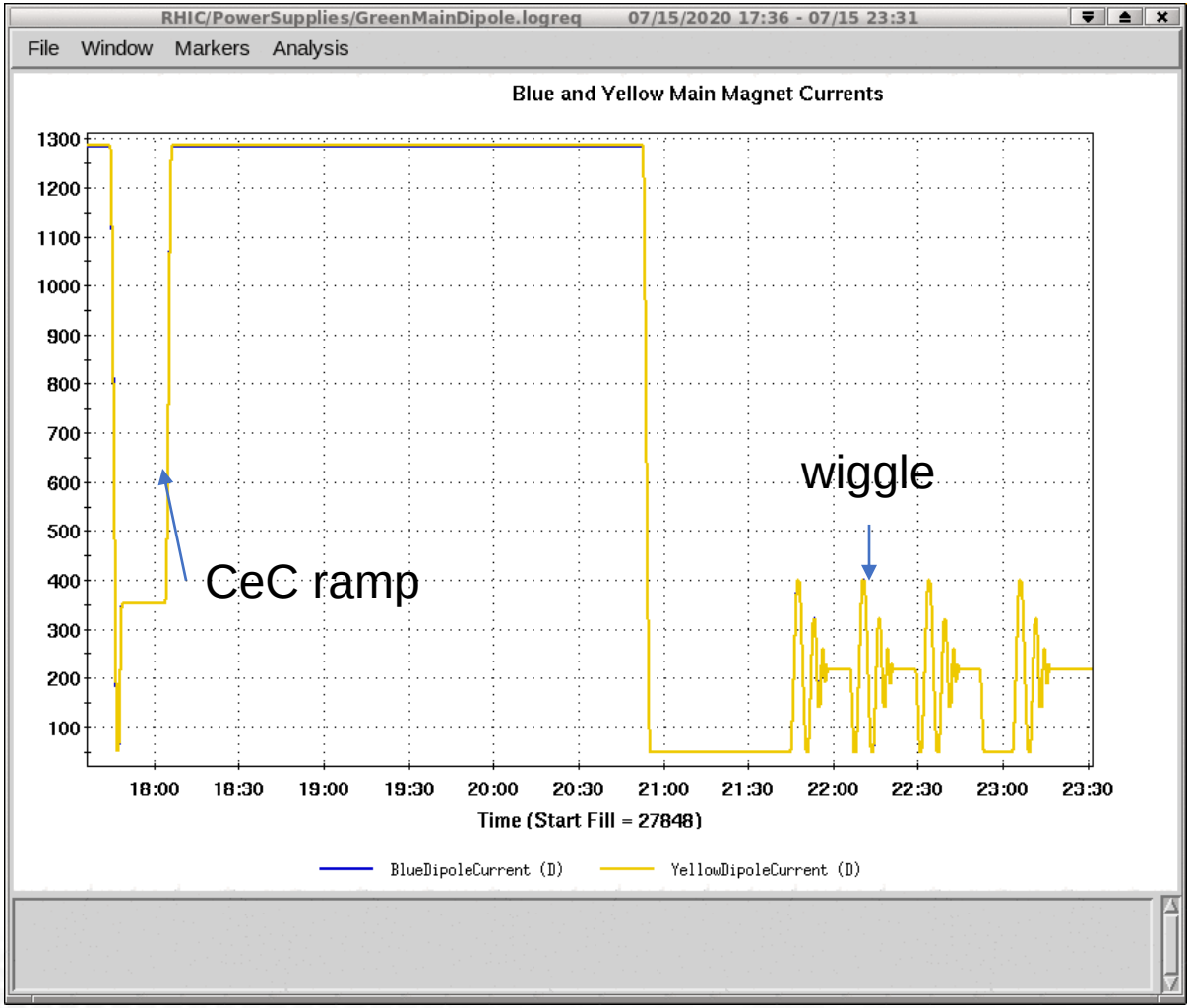
- Adjustment of collimators were needed more often to control STAR background, due to a different hysteresis state and temperature variation.
- Ramping down cavity voltage from 60 to 40 kV was re-engaged for the benefit of beam lifetime, however, reverted due to minimal gain of rate and tuner slips.
- AGS supercycle length was reduced from 6 to 5.4 s which helps improve beam intensity in collision and shorten turn-around time.
- With improvements of beam intensity thanks to multiple efforts, we are running at record high intensity. Based on the observation that trigger rate did not go up with intensity square, we decided to run EBIS with ~10% lower intensity to help cathode lifetime. No obvious degradation of trigger rate due to the reduction of intensity.

Running at high temperature

- The BPM electronics are extremely hot in the following areas: 7C, 7W, 8B, 10A. AC tech made progress to bring temp down in 1004A and 7W.
- BPMs in 8B were turned off for a few hours. Physics stores kept running without compromised performance.
- We would not be able to ramp with BPMs in 8B turned off. CeC commissioning with ion should avoid hot days.

Hysteresis after CeC ramp

- Four wiggle ramps was executed however not able to bring us back to the same state.
- Tunes, chroms, and horizontal average orbit was off so beam lifetime was horrible.
- A 12 by 12 ramp was performed with feedbacks and then feed-forward was applied before physics fill.
- Follow-up collimator adjustments were made to control background signal.


RHIC/PowerSupplies/GreenMainDipole.logreq 07/15/2020 17:36 - 07/15 23:31
File Window Markers Analysis
Blue and Yellow Main Magnet Currents
1300
1200
1100
1000
900
800
700
600
500
400
300
200
100
CeC ramp
wiggle
18:00 18:30 19:00 19:30 20:00 20:30 21:00 21:30 22:00 22:30 23:00 23:30
Time (Start Fill = 27848)
BlueDipoleCurrent (D)
YellowDipoleCurrent (D)

Tests to recover faster from CeC ramps

- Two proposals for testing:
  - Addition of one more cycle in the wiggle ramp.
  - Addition of a pre-cycle (for example back and forth between 50 and 100 A) before the wiggle ramp.