# RHIC status

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Time meeting

03/10/2020

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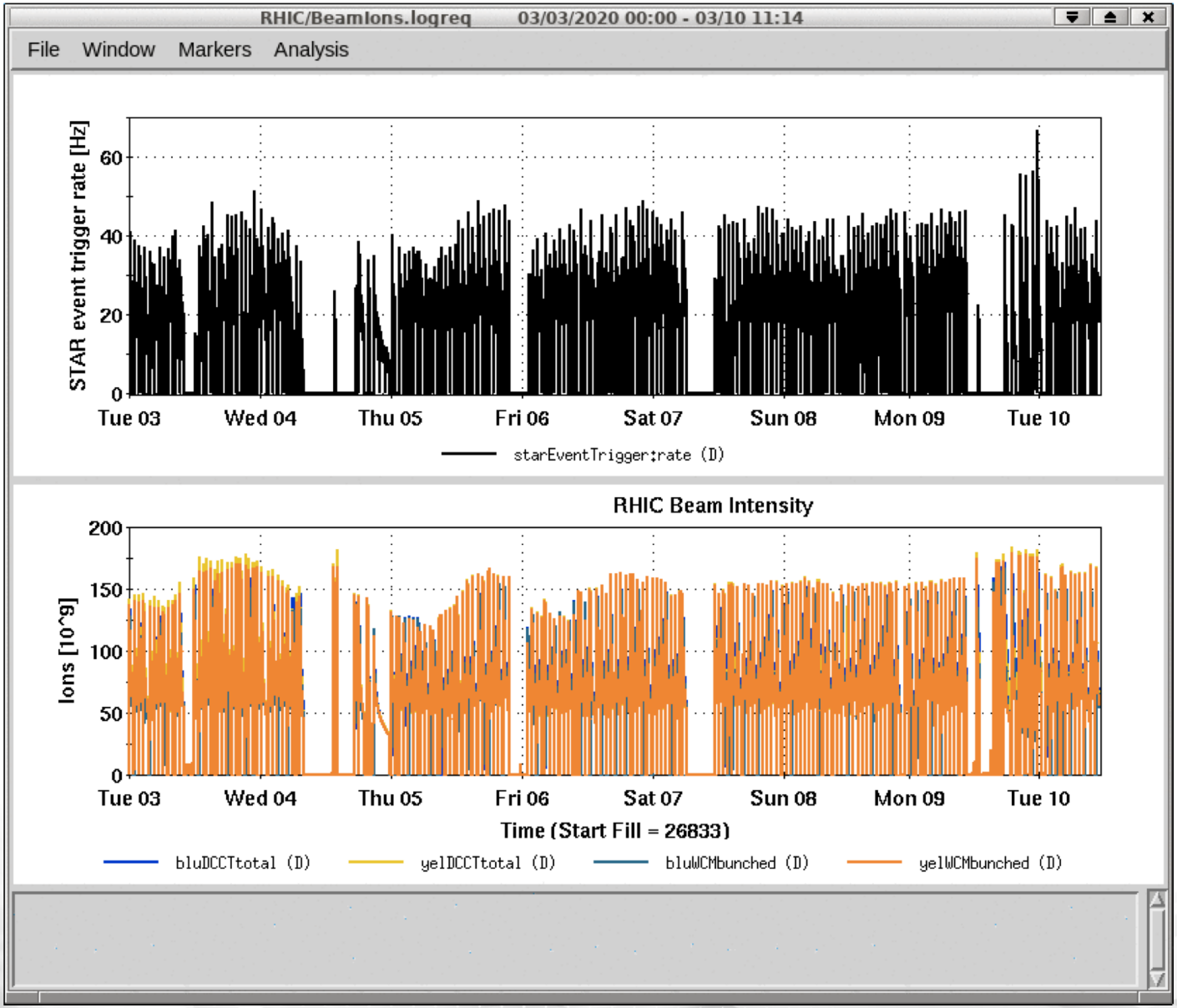
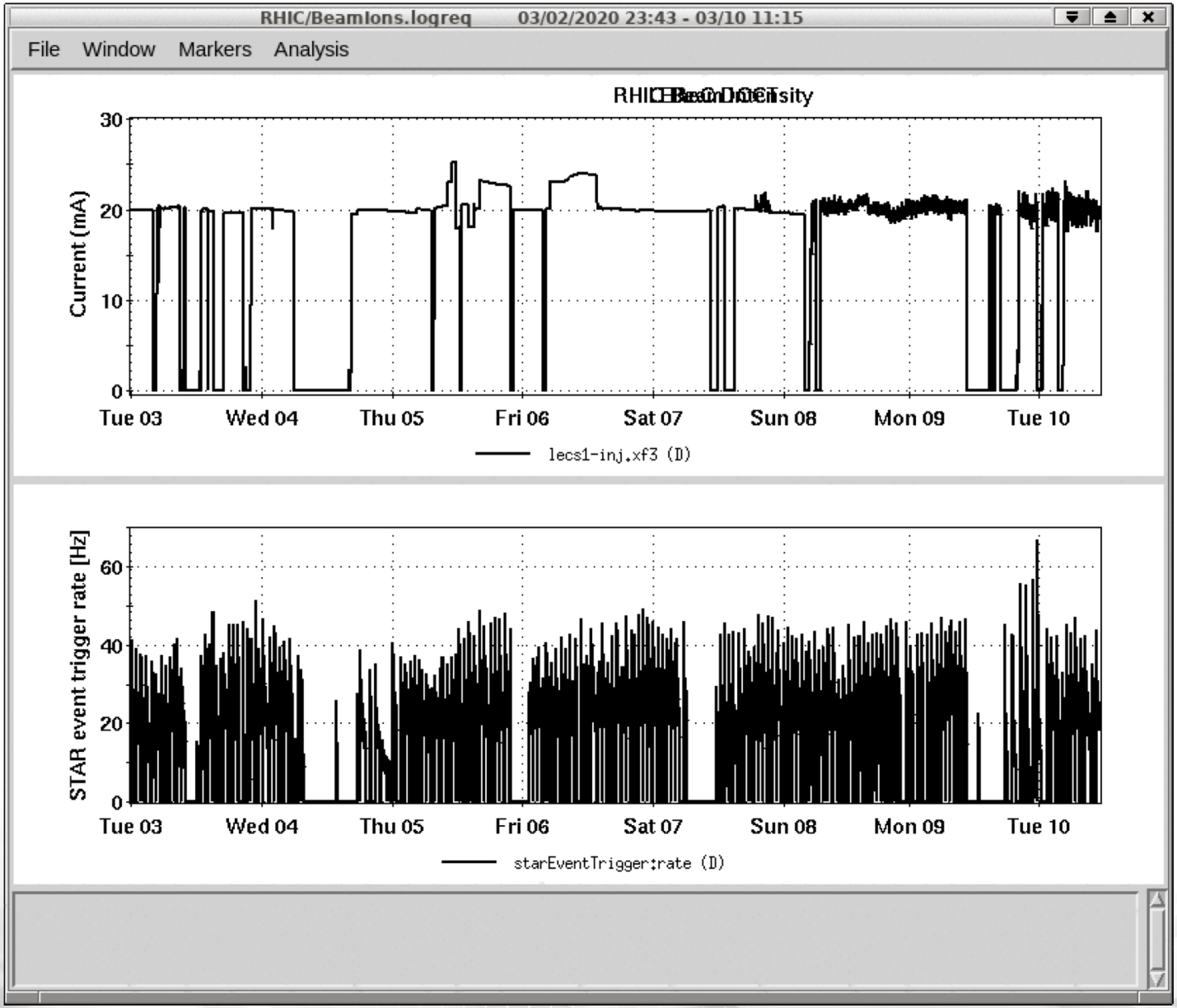
U.S. DEPARTMENT OF ENERGY

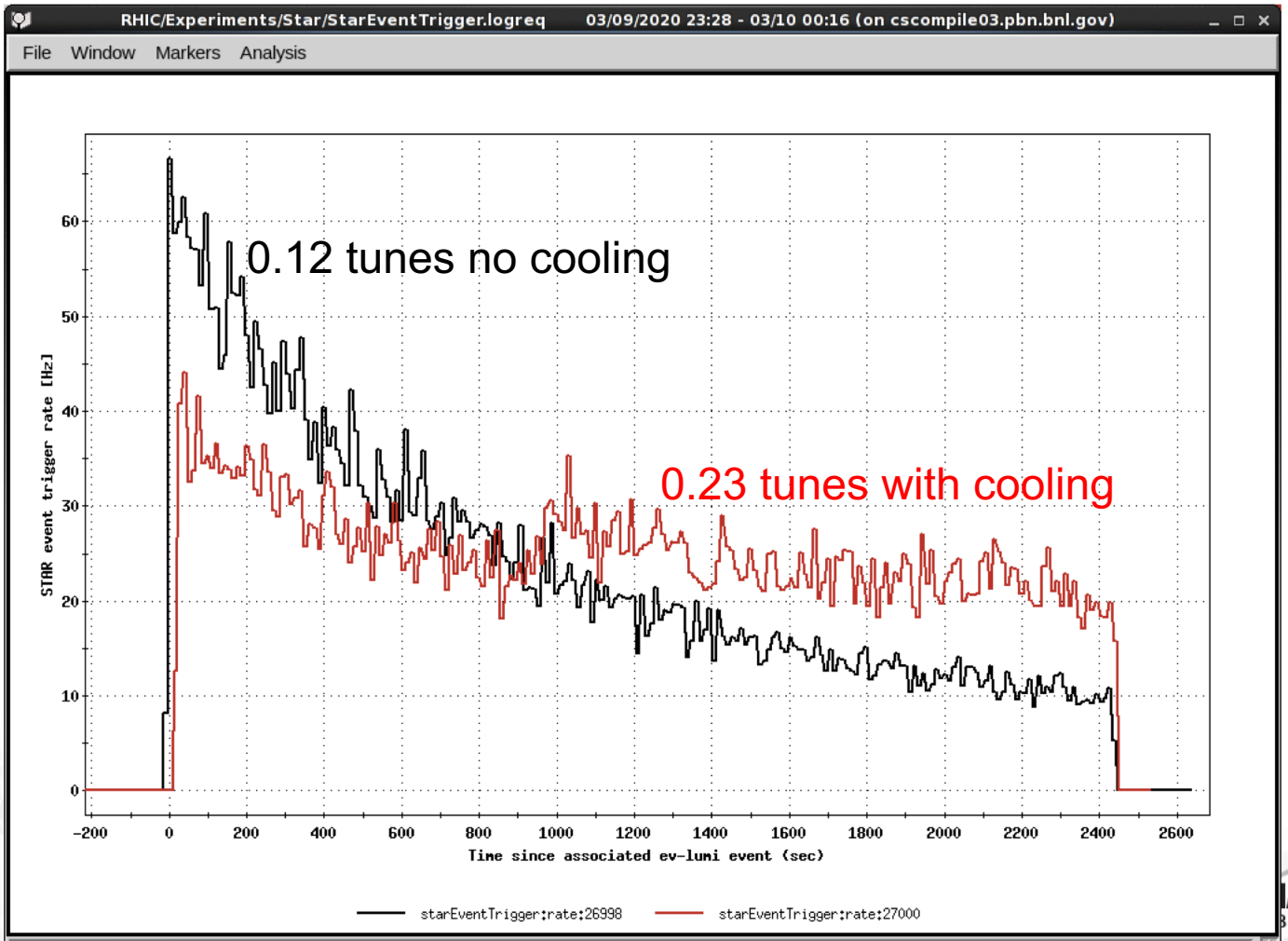

RHIC/BeamIons.logreq 03/03/2020 00:00 - 03/10 11:14
File Window Markers Analysis
STAR event trigger rate [Hz]
0
20
40
60
Tue 03
Wed 04
Thu 05
Fri 06
Sat 07
Sun 08
Mon 09
Tue 10
starEventTrigger:rate (D)
RHIC Beam Intensity
Ions [10^9]
0
50
100
150
200
Tue 03
Wed 04
Thu 05
Fri 06
Sat 07
Sun 08
Mon 09
Tue 10
Time (Start Fill = 26833)
bluDCCTtotal (D)
yelDCCTtotal (D)
bluWCMbunched (D)
yelWCMbunched (D)


RHIC/BeamIons.logreq 03/02/2020 23:43 - 03/10 11:15
File Window Markers Analysis
Current (mA)
30
20
10
0
Tue 03
Wed 04
Thu 05
Fri 06
Sat 07
Sun 08
Mon 09
Tue 10
lecs1-inj.xf3 (D)
STAR event trigger rate [Hz]
60
40
20
0
Tue 03
Wed 04
Thu 05
Fri 06
Sat 07
Sun 08
Mon 09
Tue 10
starEventTrigger:rate (D)

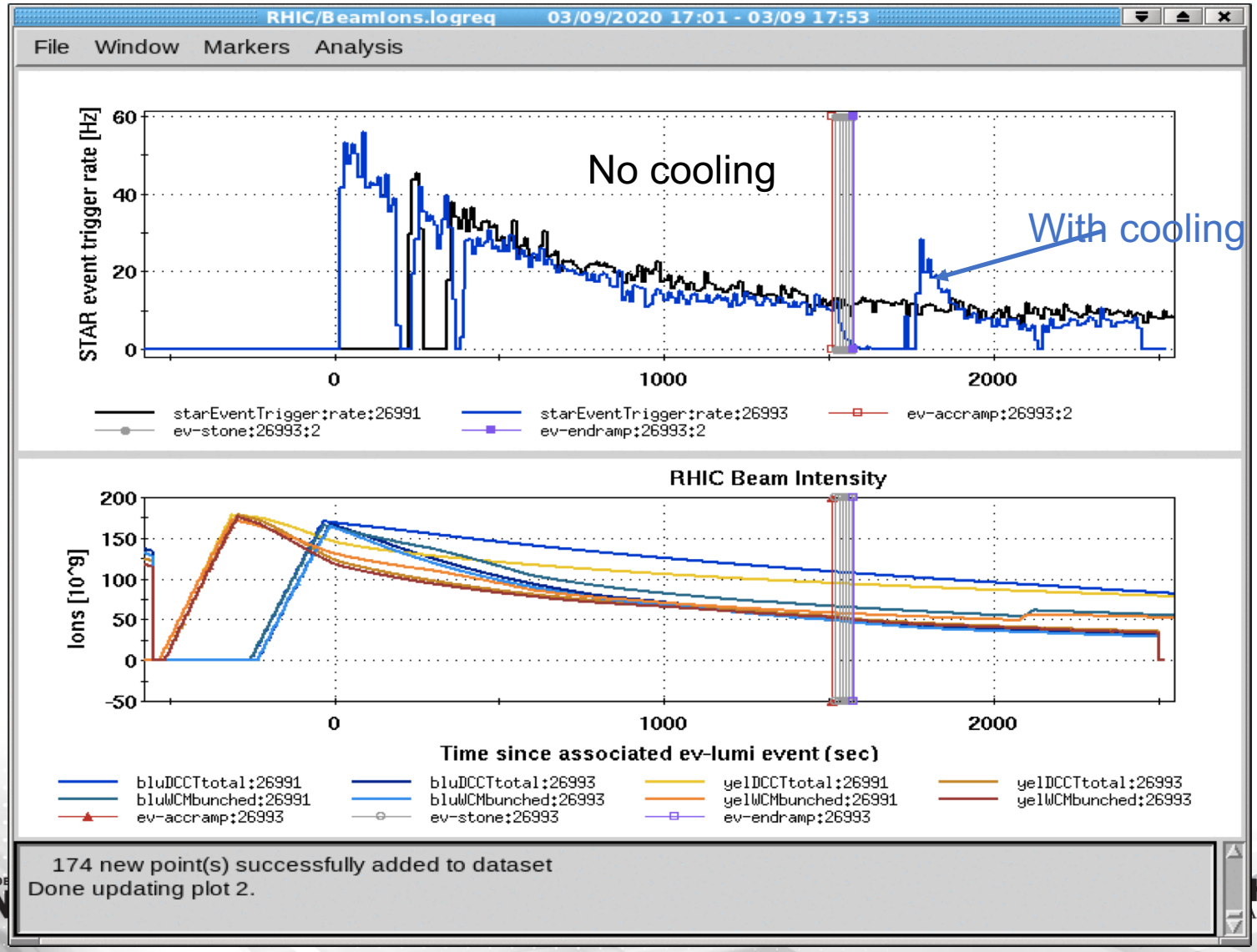
# Beam development of 0.12 working point

- This study aimed to find a better working point for beam lifetime in collision and also is compatible with LEReC cooling. The space charge tune shift with the current intensity is ~0.1. With the ~0.23 tune, the beam needs to sit far enough from 0.25 and large amplitude particles with space charge defocusing experience resonance at 0.2 as well.
- With the new working point, the single beam lifetime was better, the beam lifetime in collision is better in blue and similar in yellow. The store with new working point without cooling see higher initial collision rate.

# Comparison of two working points



# Cooling with tunes ~0.12



# Compatibility with LEReC

- LEReC electron beam introduces stronger synchro-betatron resonance at 0.12 tunes than at 0.23 tunes which results in higher beam loss.
- The transverse and longitudinal cooling were observed at 0.12 working point.
- The effect of cooling was cancelled out by the higher beam loss.

# Other notable items

- With a malfunctioning module, G10 is currently running with 3 out 4 modules per Vincent's suggestion.
- Added the 2nd Beta squeeze 30 minutes into stores.
- The first beta squeeze has been executed without tune feedback to avoid mishap of BBQ locking.
- MCR switches from 6 s to 5.6 s super-cycle whenever NSRL finishes the science study for the day.
- Blue abort kicker has tripped five times recently.