RHIC status

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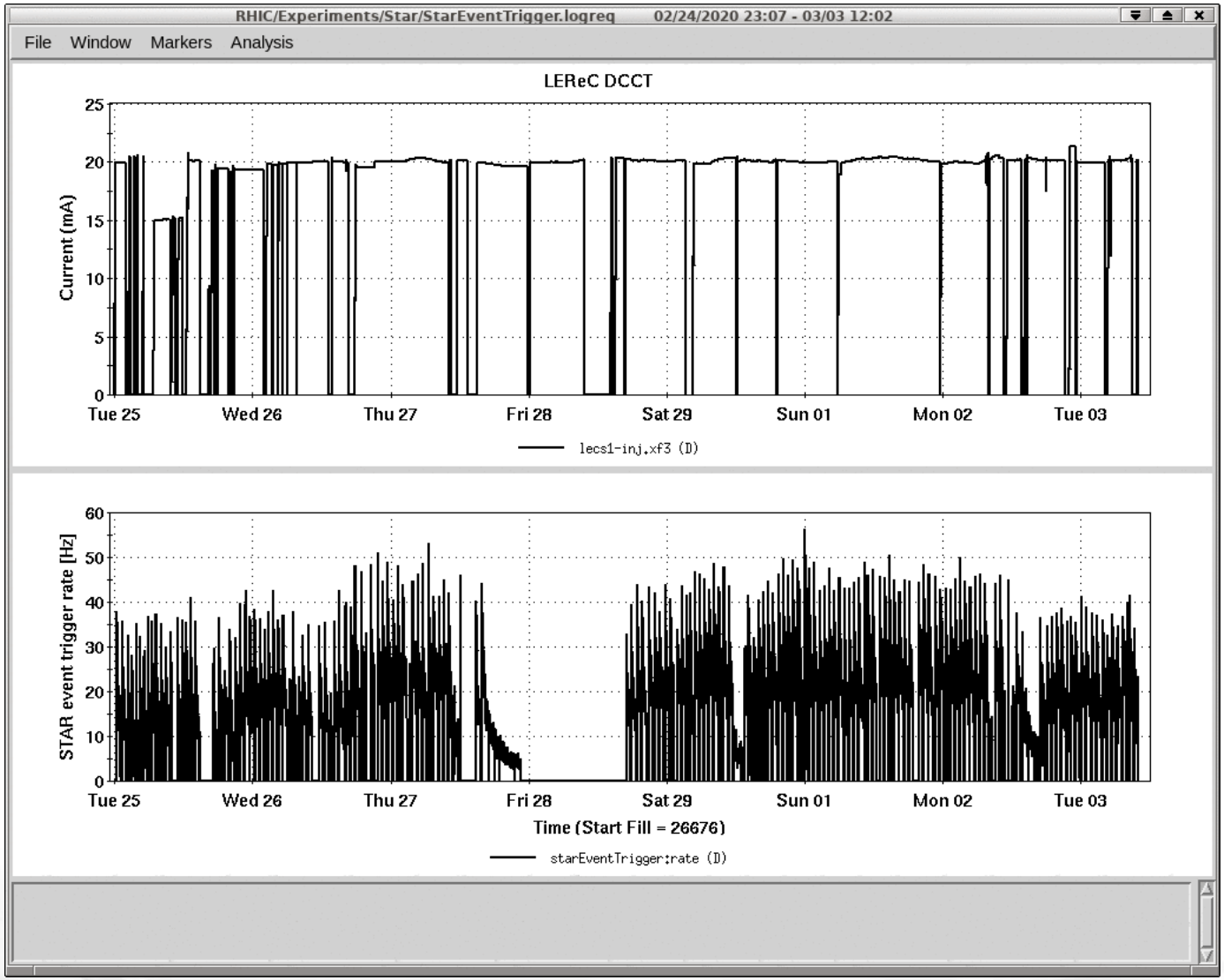
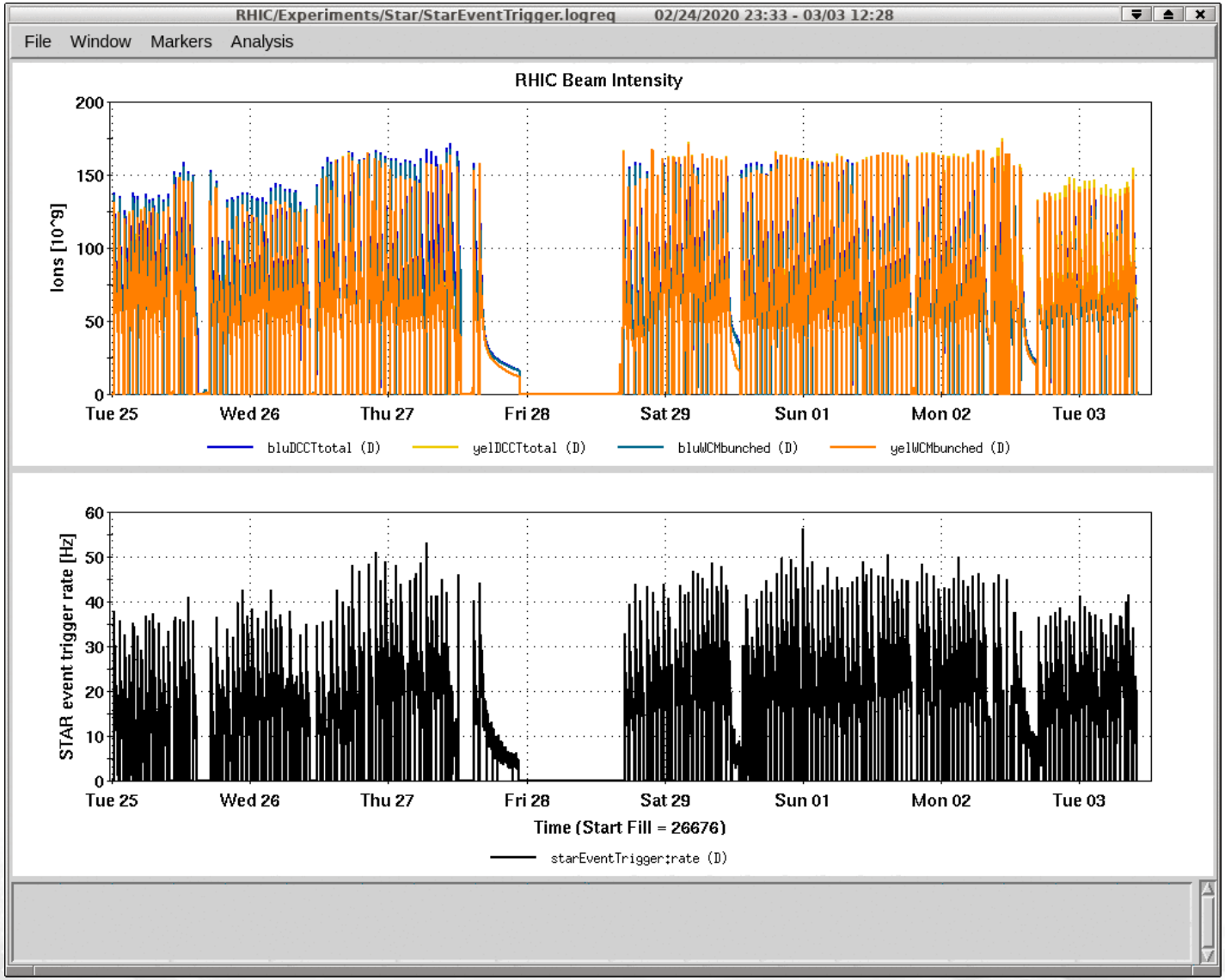
Time meeting

03/03/2020

BROOKHAVEN NATIONAL LABORATORY

U.S. DEPARTMENT OF ENERGY


RHIC/Experiments/Star/StarEventTrigger.logreq 02/24/2020 23:07 - 03/03 12:02
File Window Markers Analysis
LEReC DCCT
Current (mA)
25
20
15
10
5
0
Tue 25
Wed 26
Thu 27
Fri 28
Sat 29
Sun 01
Mon 02
Tue 03
lecs1-inj.xf3 (D)
STAR event trigger rate [Hz]
60
50
40
30
20
10
0
Time (Start Fill = 26676)
starEventTrigger:rate (D)


RHIC/Experiments/Star/StarEventTrigger.logreq 02/24/2020 23:33 - 03/03 12:28
File Window Markers Analysis
RHIC Beam Intensity
Ions [10^9]
200
150
100
50
0
Tue 25
Wed 26
Thu 27
Fri 28
Sat 29
Sun 01
Mon 02
Tue 03
bluDCCTtotal (D)
yelDCCTtotal (D)
bluWCMbunched (D)
yelWCMbunched (D)
STAR event trigger rate [Hz]
60
50
40
30
20
10
0
Time (Start Fill = 26676)
starEventTrigger:rate (D)

Notable items

- Beta squeeze starts 15 minutes into the stores, and last for 1 minute. We used to ramp continuously for 10 minutes.
- BBQ locking to a second peak problem was solved in Yellow, which avoid large beam loss when engaging tune feedback during squeeze. The same problem is emerging in blue as well.
- STAR is tuning on triggers fast than before, no delays after lumi.
- Ramping down cavity voltage during stores was observed to be beneficial: better lifetime and cooling. Now we are running with 120 kV instead of 180 kV total voltage.

LEReC cooling

- LEReC uptime has been improving. Blue cooling was optimized.
- Operators are taking leading role of operating LEReC machine.
- Instructions for aligning orbit and energy, turning off and on cavities in case of trips have been established.

Things to watch for

- CeC tripped LEReC DC gun when running 10 nc/second. Dangerous!
- The LEReC system was not ramped down before IR2 access key was taken off the panel, which crashed DC gun and SRF cavity. Dangerous!

Plans for improvement

- Beam developments exploring new working points, 0.18 and 0.12, are scheduled on Tuesday and Thursday.
- The working point needs to sit at places clear of low order resonances, for example 0.25, 0.2 and 0. The size of tune foot print is characterized by space charge tune shift, which is ~0.1, with space charge pushing down the tunes for individual particles.