Machine and Run Status

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19-March-2021

Run 2021

- **7.7 GeV Collisions**
- **Projections**

Review of the Past Week

First notable STAR delay

Day	Hours of data taking	Number HLTgood Events	Issues	Hours down
Friday Mar 12	15.4	1.16 M	3 PM Damper Commissioning	2 H
Saturday Mar 13	13.3	1.03 M	STAR TOF recovery 1-5 AM	4 H
Sunday Mar 14	15.9	1.17 M	Daylight Savings TIme	1 H
Monday Mar 15	6.8	0.46 M	CeC 10:00 – 6:00, Magnet Trip	13 H
Tuesday, Mar 16	17.8	1.37 M	none	
Wednesday, Mar 17	9.5	0.81 M	Maintenance, LEReC	8 H
Thursday, Mar 18	14.1	1.10 M	Magnet Trips	4 H
Friday, Mar 19	TBD	TBD		

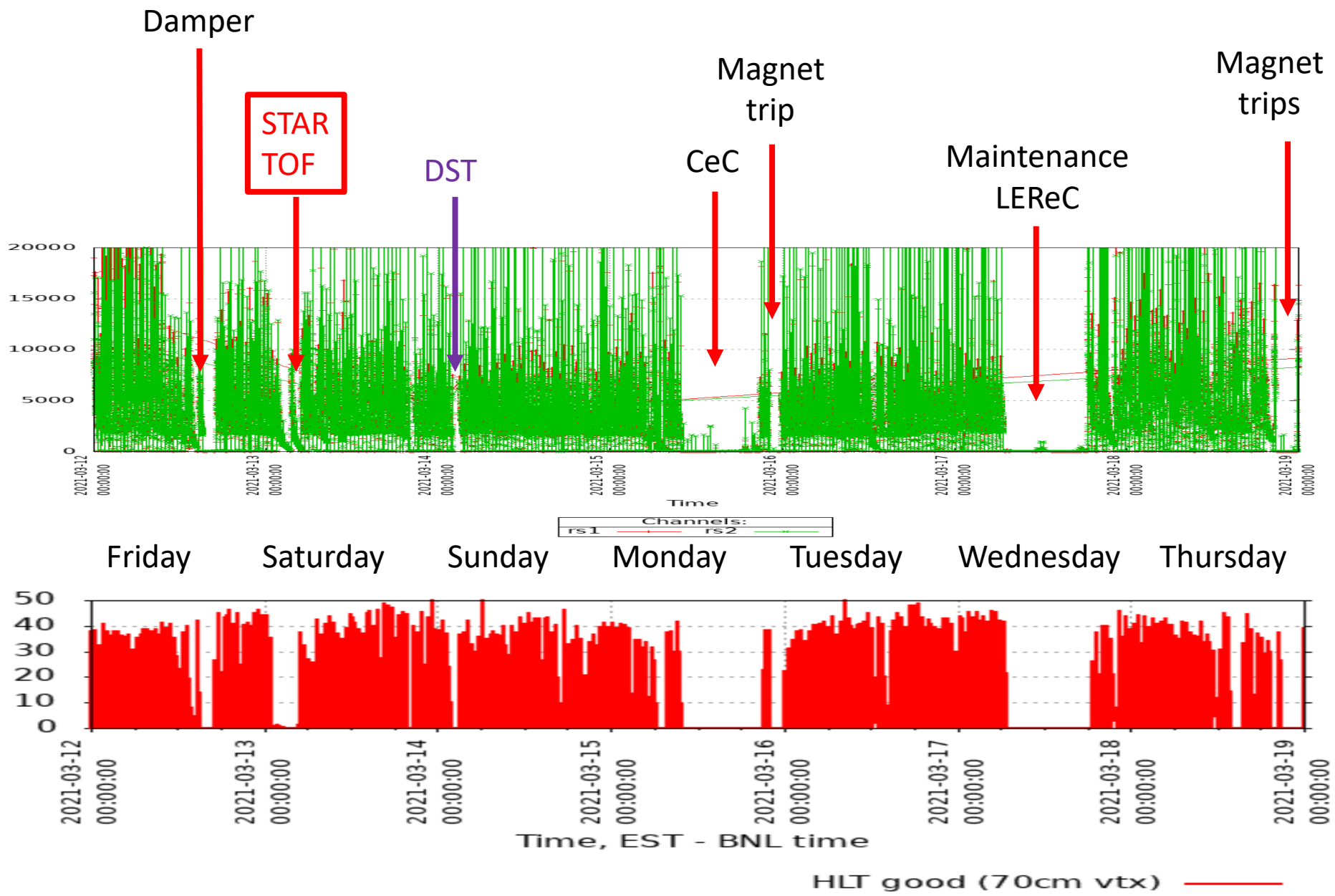
Averaging 13.25 hours per day
Averaging 1.01 M events per day

← better than last week

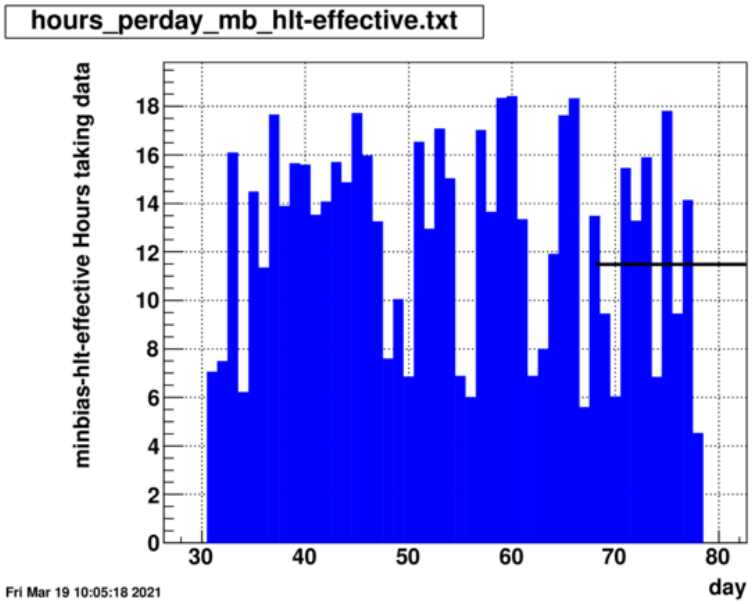
Saturday Runs 22072023, 25, 26, 27, 28, 29, 30, 31, 32 -- No VPD
Monday Runs 22074009-021 – RDO iTPC 3-2 Masked out
Tuesday Run 22075003 – No VPD
Thursday Run 22077029 and 30 – No L4

Performance is pretty much optimized, at this point… now trying to maintain this performance

7.7 GeV Collider Running



7.7 GeV collisions Run Overview

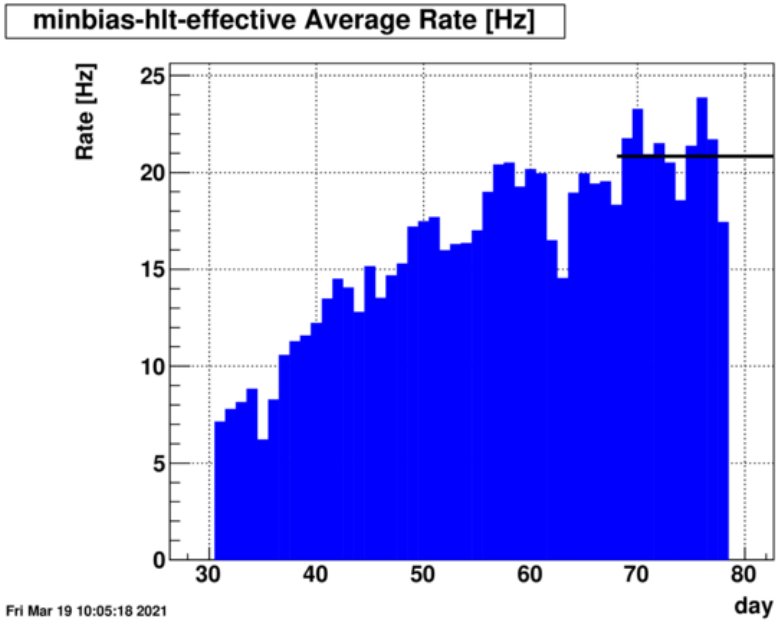


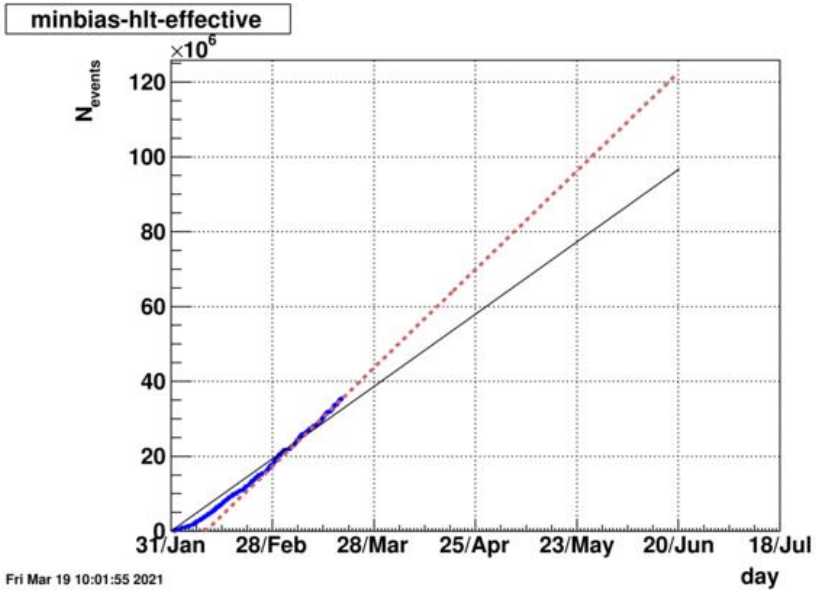
- Average over the past week was 13.25 H
- We are likely to only reach 13.5 H average due to CeC (10%), APEX and maintenance (5%)
- BUR estimate was 12-15 Hours/day

- HLTgood rate is currently 21 Hz.
- BUR estimate was 16-24 Hz

- Currently at 35.5 (+3.2) M HLTgood events. Project to complete around May 19th.

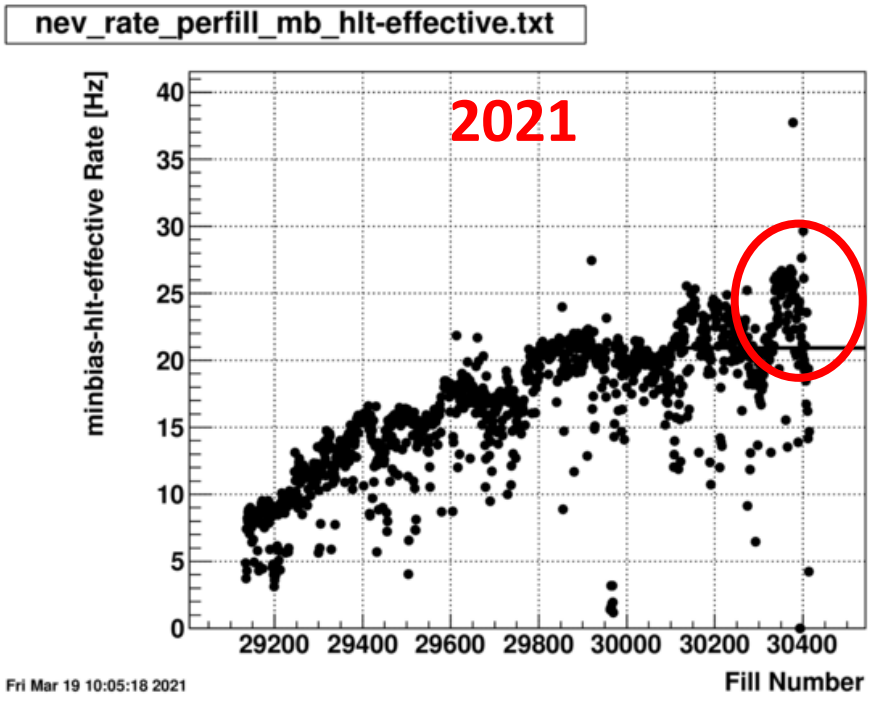
Last week this was May 31st





HLT Good Event Rate:

Recent change to operating procedures

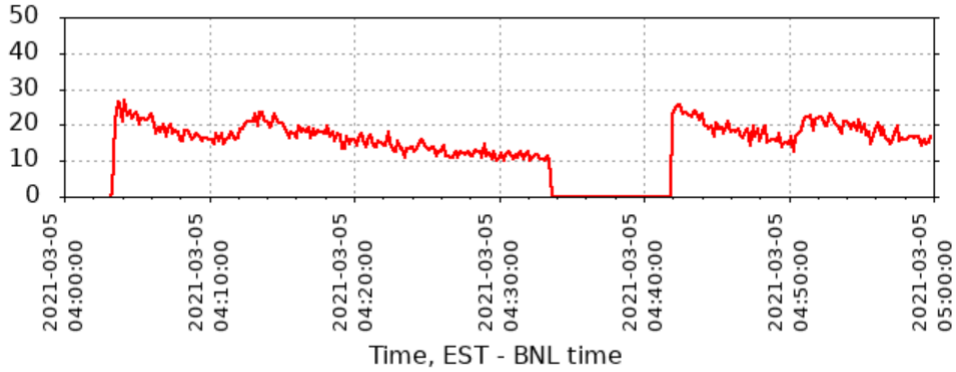


Last week – "High Tune"

30 minute fills

Intensity ~100E9

LEReC working well

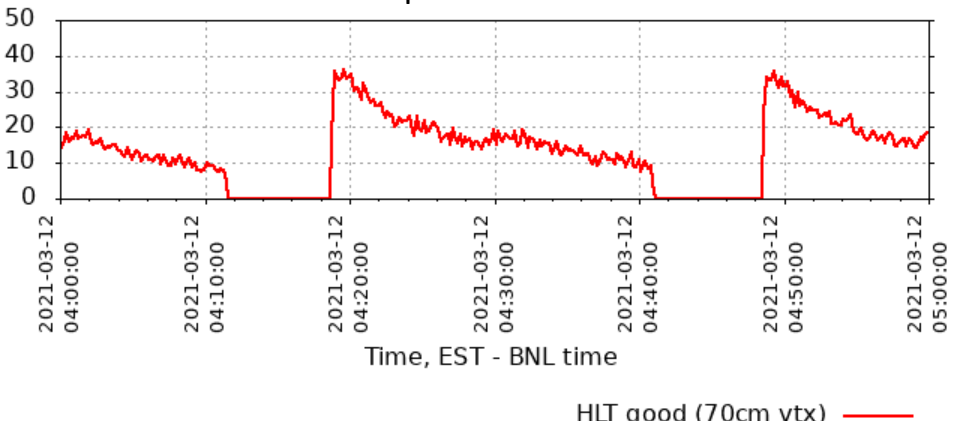


This week – "Low Tune"

25 minute fills

Intensity ~150E9

LEReC not optimized



Staying with the low tune

Projections for the full Run 21 physics agenda:

Run-21:

Single-Beam Energy (GeV/nucleon)	$\sqrt{s_{NN}}$ (GeV)	Run Time	Species	Events (MinBias)	Priority
3.85	7.7	11-20 weeks	Au+Au	100 M	1
3.85	3 (FXT)	3 days	Au+Au	300 M	2
44.5	9.2 (FXT)	0.5 days	Au+Au	50 M	2
70	11.5 (FXT)	0.5 days	Au+Au	50 M	2
100	13.7 (FXT)	0.5 days	Au+Au	50 M	2
100	200	1 week	O+O	400 M 200 M (central)	3
8.35	17.1	2.5 weeks	Au+Au	250 M	3
3.85	3 (FXT)	3 weeks	Au+Au	2 B	3

Table 2: Proposed Run-21 assuming 24-28 cryo-weeks, including an initial one week of cool-down, one week for CeC, a one week set-up time for each collider energy and 0.5 days for each FXT energy.

24 Weeks (How much of the program are we likely to complete:

7.7 GeV : 6 weeks spent, 11 weeks to go.
CeC : concurrent (10%)
APEX/maintenance: concurrent (5%)
} Highly Likely

Priority 2: 1 week ➔ Highly Likely (Late May)
Priority 3a: 1 week ➔ Highly Likely (Early June)
Priority 3b: 2.5 weeks ➔ Likely (Late June)
Priority 3c: 3 weeks ➔ 50/50 for completion by end of operations in mid-July
Priority X: 1 week ➔ TBD (CeC parasitic ➔ 7.2 GeV FXT)

Summary

- Performance with low tune is improvement
- HLTgood rate is averaging 21 Hz, which is in the middle of our range of projections
- Hours per average was 13.2 last week, at the high end of our range of our CeC corrected projections
- We are on track to complete 7.7 GeV collisions by May 19th.
- Likely also to complete most of the priority 2 and 3 items in our BUR.
- With continued performance at this level, or with improvements to rates, we could complete our entire physics program.
- May start considering "opportunity physics" for end of run.

Overall Run Status

Energy	Start	Finish	First Run	Last Run	HLTgood	Target
7.7 GeV	Jan 31st	TDB	22031042	TDB	38.7 M	100 M
3.0 FXT						
9.2 FXT						
11.5 FXT						
13.7 FXT						
O+O 200						
17.1 GeV						
3.0 FXT						
26.5 FXT						
53 GeV						