Run 20 RHIC Machine/Experiments Meeting

February 18, 2020

Agenda:

- General discussion of Run 20 & Scenario for discussion - W. Christie
- Collider Update - V. Schoefer
- STAR Status/update - J.H. Lee
- All Other Business (AOB)

BLUEJEANS CONNECTION INFO:
To join the meeting on a computer or mobile phone: https://bluejeans.com/273705843/1875?src=calendarLink

Phone Dial-in +1.408.740.7256 (US (San Jose))
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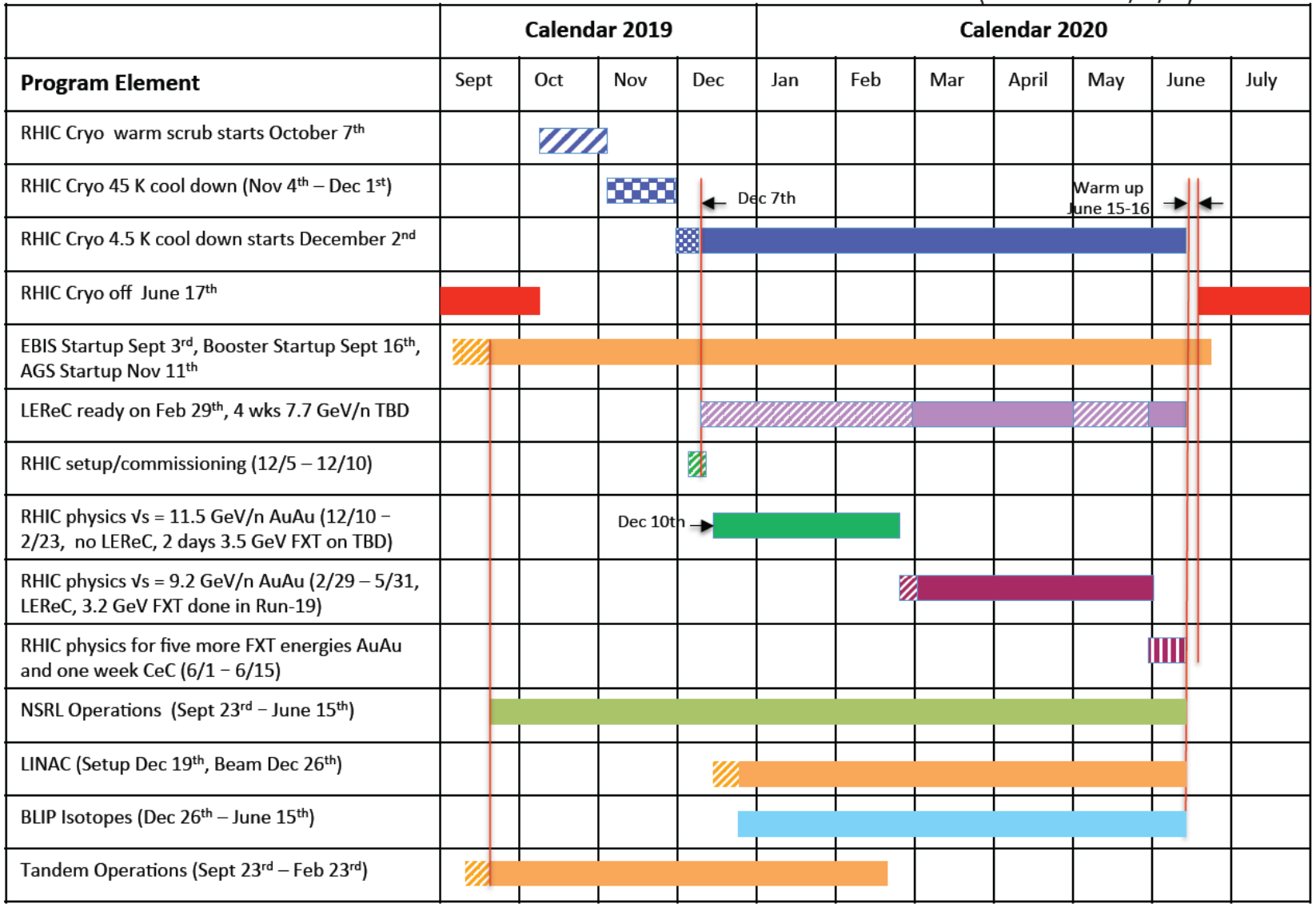
Global Numbers: http://bluejeans.com/numbers
Meeting ID: 273 705 843

RHIC Run FY20 Run Schedule

(Revision date: 12/10/19)



N.B. The Schedule above assumes that RHIC Run 2020 will be 28 Cryo weeks long.

The actual transition date between 11.5 and 9.2 GeV Physics running will be a matter of discussion as the run progresses.

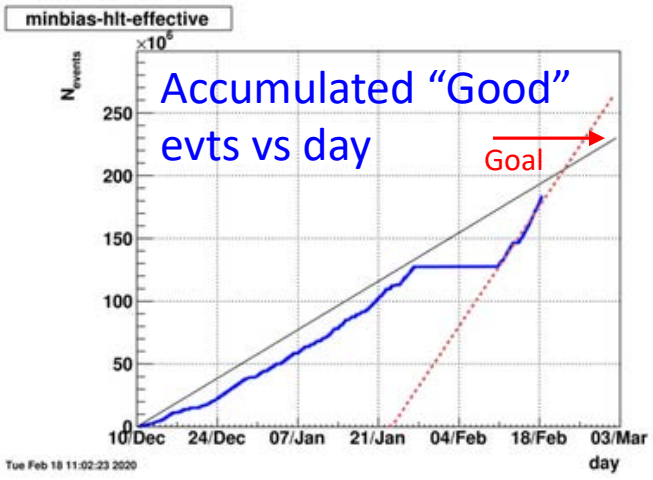
STAR Beam Use Request for Run20

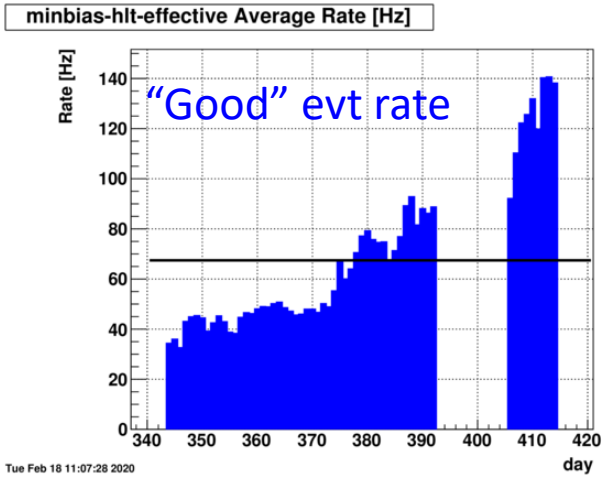
	Beam Energy (GeV/nucleon)	$\sqrt{s_{NN}}$ (GeV)	μ_B (MeV)	Run Time	Number Events "Good" requested / collected	
	9.8	19.6	205	4.5 weeks	400M	**582M** Done
	7.3	14.5	260	5.5 weeks	300M	**324M** Done
Run20	5.75	11.5	315	9.5 weeks	230M	~ 183 Mevts at present
Run20	4.55	9.1	370	9.5 weeks	160M	~ 7 Mevts at present
Run20	3.85	7.7	420	12 weeks	100M	
	31.2	7.7 (FXT)	420	2 days	100M	Done
	19.5	6.2 (FXT)	487	2 days	100M	Done
	13.5	5.2 (FXT)	541	2 days	100M	Done
	9.8	4.5 (FXT)	589	2 days	100M	Done
	7.3	3.9 (FXT)	633	2 days	100M	Done
	5.75	3.5 (FXT)	666	2 days	100M	Done
	4.55	3.2 (FXT)	699	2 days	100M	**201M** Done
	3.85	3.0 (FXT)	721	2 days	100M	**3.7M+300M (run18)** Done

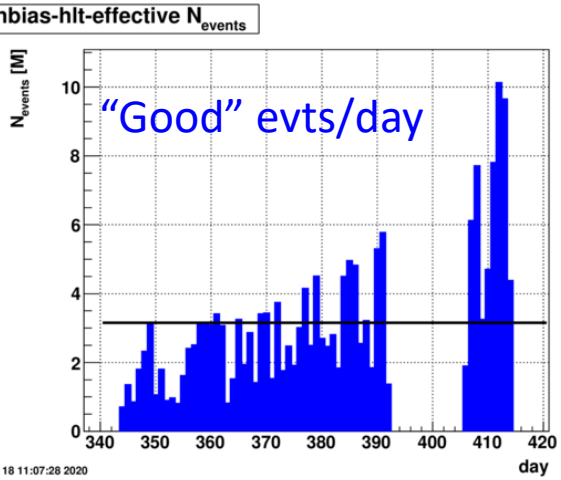
- Top priority for Run20 is measuring next two energies in BES-II at **$\sqrt{s_{NN}}$= 11.5 GeV and 9.2 GeV**
- Finishing **fixed target** measurements at $\sqrt{s_{NN}}$ = 3.5, 3.9, 4.5, 5.2, 6.2, 7.7 GeV

Slide from the 12/3/19 STAR Time mtg presentation

An extremely successful return to collisions at 11.5 GeV





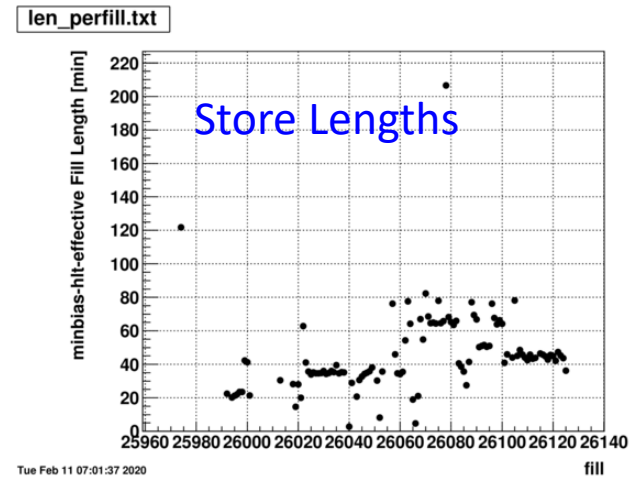


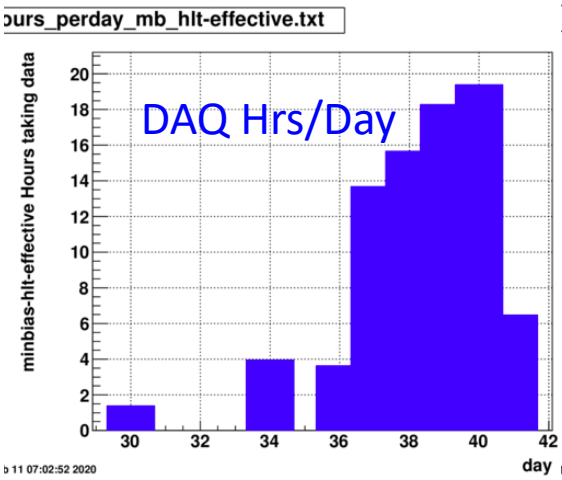
"Good" evt rate increased significantly!

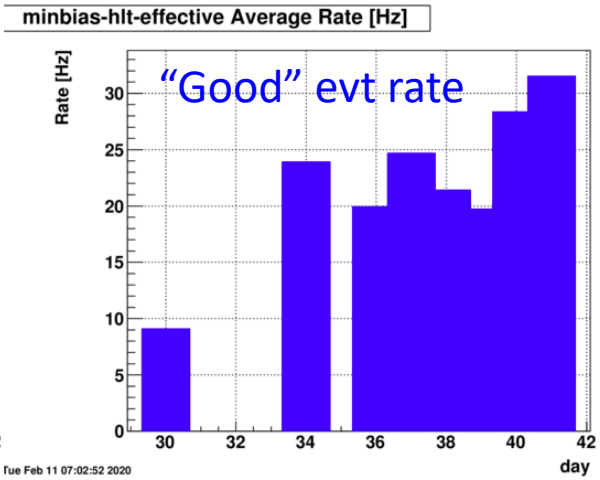
Estimate for how long it might take to complete the 11.5 GeV data set:

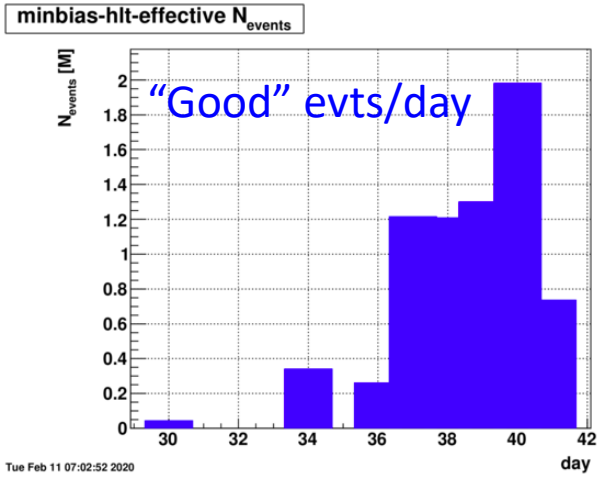
- 183 M "good" evts in hand
- Goal is 230 M "good" evts (~ 47 Mevts to go)
- 9.2 GeV LEReC interleaved commissioning is done. Is time needed to restore?
- Use assumptions of 16 hrs/day of DAQ running, and store averaged "good" evt rates of 130 Hz
- 16 hrs/day x 3600 sec/hr x 130 evts/sec = 7.5 Mevts/day
- 47 Mevts/7.5 Mevts/day = 6.3 days (adding on 0.5 day maintenance -> ~7 days)
- With the above assumptions, this would project the change over date as Tuesday 2/25
- I judge the estimate above as somewhere between realistic and conservative
- Better projection possible Friday morning. Monday (2/24) possible.

Estimate for how long it will take to collect the 9.2 GeV data set









Estimates based on *observed* performance:

If one assumes 15 Hrs/day of DAQ running, at an average rate of 33 Hz:

- 15 hrs/day x 3600 sec/hr x 33 evts/sec = 1.8 Mevts/day
- Data set goal is 160 M "good" evts (Currently have 7 Mevts)
- 153 Mevts/1.8 Mevts/day = 85 days = 12.4 wks
- Add 6 maintenance half/days makes estimate ~ **13 wks**

Reasons to believe that the estimate above is realistic:

- After only a few days of optimization, 2 M "good" evts were recorded in a day
- There was a store that had an average "good" event rate of 38 Hz
- Historically, the RHIC luminosity takes weeks of running to reach luminosity plateau

A possible Scenario for how the rest of Run 2020 might proceed

January

Su	Mo	Tu	We	Th	Fr	Sa
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

February

Su	Mo	Tu	We	Th	Fr	Sa
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29

March

Su	Mo	Tu	We	Th	Fr	Sa
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

April

Su	Mo	Tu	We	Th	Fr	Sa
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

May

Su	Mo	Tu	We	Th	Fr	Sa
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

June

Su	Mo	Tu	We	Th	Fr	Sa
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

We went back to 11.5 GeV Physics running on Monday February 10th, estimate is that we'll complete 230 Mevts goal by Tuesday February 25th.

If 9.2 GeV Physics running is from February 26th, to May 27, this is 13 wks. With ***observed*** rates for 9.2 GeV collisions this should be sufficient time to reach full 130 Mevts goal.

12 days of 7.7 GeV LEReC commissioning gets one to June 8th.

8 days of CeC then gets one to June 15th, the end of a 28 Cryo week run (N.B. assumption of 28 Cryo week run.

N.B. The 9.2 Gev Physics running, 7.7 GeV LEReC commissioning, and CEC time may well be run in an interleaved mode from March to the end of the run.

All Other Business (AOB)