Towards Run24

RIKEN/RBRC

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Towards Run24

https://indico.bnl.gov/event/20331/

Beam Use Proposal: sPHENIX

Species	$\sqrt{s_{NN}}$ [GeV]	Physics Weeks	Min. Bias Rec. Lum. $ z < 10~{ m cm}$	Calo. Trigger Lum. $ z < 10 \text{ cm}$								
Run-2024, Scenario A, 6 cryo-weeks Au+Au + 20/24/28 cryo-weeks p+p												
Au+Au	200	n/a	n/a (Commissioning	g running)								
p+p	200	13/17/21	0.34/0.44/0.54 pb ⁻¹ [@ 5kHz] 2.3/3.1/3.9 pb ⁻¹ [10%-str]	23/31/39 pb ⁻¹								
Run-2024, Scenario B, 20/24/28 cryo-weeks $p+p+6$ cryo-weeks Au+Au												
<i>p</i> + <i>p</i>	200	9/13/17	0.23/0.34/0.44 pb ⁻¹ [@ 5kHz] 1.5/2.3/3.1 pb ⁻¹ [10%-str]	15/23/31 pb ⁻¹								
Au+Au	200	3	$0.4~\mathrm{nb^{-1}}$ (3B events)	not needed								
Run-2025, 24/28 cryo-weeks												
Au+Au	200	20.5/24.5	$5.2/6.3 \text{ nb}^{-1} (35B/43B \text{ events})$	not needed								

No Au+Au instead of p+A

Beam Use Proposal: STAR

Plans for Run-24

28 cryo-weeks for p+p, p+Au in Run 24

28 cryo-weeks in Run 25 and 6 additional cryo-weeks in Run 24 for Au+Au

	$\sqrt{s_{ m NN}}$	Species	Number Events/	Year	1.2
	(GeV)		Sampled Luminosity		lun , (p+
ſ	200	$p{+}p$	$142~{ m pb^{-1}}/12{ m w}$	2024	"
	200	$p{+}\mathrm{Au}$	$0.69~{ m pb^{-1}/10.5w}$	2024	2.7
	200	Au+Au	$18\mathrm{B}\ /\ 32.7\ \mathrm{nb^{-1}/40w}$	2023 + 2025	d trai

1.2 (1.5) times the total uminosity in Run-15 p+p (p+Au)

2.7 (1.5) times the ransverse lumi, in Run-15

Loss of p+Au physics in 2024

- Many flagship sPHENIX measurements (γ+jet, b-jets, family of Upsilon states) critically rely on large integrated luminosities
- A large p+p data-set is also needed to reduce systematic uncertainties via, e.g., in situ detector studies (track-calo response, γ+jet balance, etc.)
- In 2021, sPHENIX was asked to prepare a BUP under a 20 cryo-week scenario in 2024. Under that scenario, sPHENIX was forced to remove all p+Au running to preserve the needed p+p luminosity.
- The reduced projections now preclude p+Au running even in 28wk scenario
- → There is a significant cost to switching species & the projected p+Au luminosity/week has also decreased significantly (> factor of 2)
- ⇒ Splitting 2024 running between *p+p* and *p+*Au will result in not meeting the luminosity target for either system

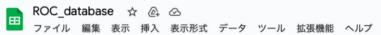
PAC Recommendation

- 1st priority : sPHENIX
- 2nd priority : p+A

Towards Run24

- INTT needs to be on in December and run calibration and cosmic ray data taking prior to run.
- 1st week of January: RHIC Cooldown starts
- Middle of January: start commissioning with beam (not yet determined if Run24 is to be started p+p or Au+Au).
- Reproduce performance of Run23.
 - Unique to p+p: Collision rate, multiplicity, spin degree of freedom, etc.
 - Establish 1BCLK timing for p+p

Man Power







B31 ▼ fv

A	В	С	D	E	F	G	Н	1	J	K	L I	M N	N O	Р	Q	R	S	Т	U	V
1	ROC#	FVTX	Regulator Upgrade	TLK Replacement	Location	Class	Barrel	A 1	A2	А3	B1 E	32 B	3 C1	C2	СЗ	D1	D2	D3	Issue	Status
2 1	6	NW2	✓		BNL	1	08			T	\neg	Т								Given to Joe (2023/01/09)
3 2	19	NE5	✓		BNL	1	1S									R				TLK2711 Replaced
4 3	28	SE0	✓		BNL	1	2S													Given to Joe (2023/01/09)
5 4	20	SW5	✓		BNL	1	3S													
6 5	29	-	✓		BNL	1	48													
7 6	23	SE1	✓		BNL	1	58													
8 7	13	NE4	✓		BNL	1	6S													
9 8	3	NW5	✓	D3	BNL	2	7S	R		R	RI	R	F			R	R	R	Fiber Sync	
10 9	8 (10)	-	✓		BNL	1	0N				- 1	R	R							
11 10	27	SE5	✓		BNL	1	1N						R			R	R	R		L12 Replaced at Column-D
12 11	31	NW1	✓		BNL	1	2N	R	R	R										
13 18	32	NE2			BNL	1							R	R	R					
14 13	17	NW3	✓	SC,B1	BNL	2	4N		F	F	R						R			SC TLK, jumber cable, C2220, C2221 repaired
15 14	2	NW4	✓	D1	BNL	2	5N				- 1	R	F			R				B1, D1 Mechanical prob in DF18
16 15	24	SE4	✓	A2	BNL	2	6N		R	R							F		Fiber Sync	TLK2711 Replaced (A3,D1)
17 16	22	SE2	1 •	A1	BNL	2	7N									F	F			A1 TLK Replaced
18 17	26	SE3			BNL	1														
19 12	18	(NE1)		SC	BNL	1	3N													Given to Joe (2023/01/09), back from Joe but damaged(2023/01/13), back fr
20 19	9	-	✓	SC	BNL	1				R										Given to Joe (2023/01/09)
21 20	15	NE0			BNL	2		R								F			Fiber Sync	2023/7/31 Repair work at REPIC
22 21	21	-		C3	RIKEN	2		R		R	R	F	₹	R		R	R			2023/7/31 Repair work at REPIC
23 22	14	NE1			RIKEN	3					I	R		R					D: All chip over15	L12 Replaced at Column-D (done), TLK replacement of A2, A3 for fakehit sti
24 23	7	-	✓		NWU	3			R	R	ı	H F	R H			R	Н			Replaced all DF18
25 24	16	NE3	✓		NWU	3					C	C							Calib Pulse	Waiting for SC-FPGA downland
26 25	5	-	✓		RIKEN	3														
27 26	11	-	-		NCU															
28 27	4	-	-		BNL															

