

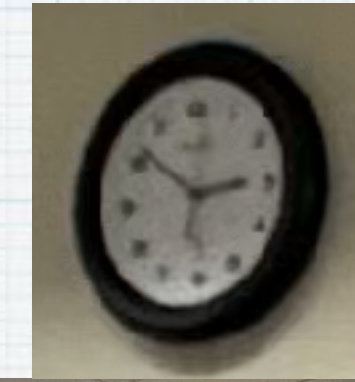
Commissioning 2025



Genki on behalf of
the onsite crew



Collisions came and gone



- Finally, RHIC made collisions on June/9 2025 before 3 am, and some early measurements were done with MBD, calorimeters(?), and MVTX. I was in the beam call list but not called.
- Because of our operation policy, physics declaration by RHIC is necessary, we didn't jump in. After discussion with Rachid and people in the shift change meeting on June/9, a new (additional) condition was made:
 - Physics declaration is not needed if
 - * The run coordinator (or someone appropriate) should confirm a good condition of beam.
 - * TPC could operate for 15 min stably. (just some trips are accepted)
- June/10 2025 around 9pm, INTT started taking AuAu collision data in the big partition together with other detectors (run66522). Then, we moved to local operation and did some scans.
- RHIC has been operated well till the cryo issue on June/11 night. RHIC need to fully warm up (where?) and cool down. It loses beam for 3 days.



6/12/2025

Recap

- Development with 111 bunches reached 1.6×10^{12} ions/bunch.
- Longitudinal stochastic cooling setup for B+Y.
- Cooling issues at 2b (ongoing), 4b (temp units), 6b and 8b (fixed, caused issue with yo8-tq4-ps).

56 MHz water flow interruption, He blowdown failure, ice formation in FPC water channels.

- A. Heaters are near ice and can effectively thaw the ice. Resume beam operations today.
- B. Heaters cannot clear ice. Full warmup+cooldown to clear blockage. 3 days no beam.

Plan of the day if A is successful (otherwise, no beam)

- Finish gap cleaning setup
- Need high intensity stores for SC setup
- Stochastic Cooling setup in afternoon/early evening pending availability
- 12x12 store for sPHENIX

Updates

- RF+Cryo
- sPHENIX
- STAR

Runs

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	Date/Time	Run#	Run Type	Mag	Link	Duration (min)	Event	MBD-NS	Active Felix List	DAC 0	L1 Delay	n_coll	open time	Modebit	Comments
52	2025/6/9 19:33	66520	pedestal	On	plot	11sec			All Felix	0				noise 500Hz	n_collisions=30, (changed to 100 after this run)
53	2025/6/9 18:31	66523	beam	On	plot	66sec			All Felix	35	90	100	60		from here, timing scan, but no date
54	2025/6/9 18:34	66525	beam	On	plot	59sec			All Felix	35	90	100	60		
55	2025/6/9 18:38	66526	beam	On	plot	60sec			All Felix	35	90	100	60		
56	2025/6/9 18:58	66527	beam	On	plot	67sec			All Felix	35	108	100	60		
57	2025/6/9 19:01	66529	beam	On	plot	58sec			All Felix	35	108	100	60		
58	2025/6/9 19:10	66531	beam	On	plot	70sec			All Felix	35	109	100	60		
59	2025/06/09 19:12	66532	beam	On	plot	61sec			All Felix	35	109	100	60		
60	2025/06/09 19:30	66534	beam	On	plot	62sec			All Felix	35	110	100	60		
61	2025/06/09 19:31	66535	beam	On	plot	64sec			All Felix	35	110	100	60		
62	2025/6/9 19:40	66536	beam	On	plot	56sec			All Felix	35	111	100	60		no data
63	2025/06/09 19:47	66539	beam	On	plot	60sec			All Felix	35	111	100	60		
64	2025/6/9 19:49	66540	beam	On	plot	63sec			All Felix	35	111	100	60		
65	2025/6/9 20:00	66542	beam	On	plot	63sec			All Felix	35	112	100	60		
66	2025/6/9 20:03	66543	beam	On	plot	60sec			All Felix	35	112	100	60		
67	2025/6/9 20:15	66544	beam	On	plot	59sec			All Felix	35	113	100	60		
68	2025/6/9 20:16	66545	beam	On	plot	60sec			All Felix	35	113	100	60		
69	2025/6/10 21:32	66689	beam	On		60sec			All Felix	35	108	100	60		from here: DAC0 Scan. This is a test run.
70	2025/6/10 21:34	66690	beam	On		2 min			All Felix	35	108	100	60		DAC0=35
71	2025/6/10 21:37	66691	beam	On		2 min			All Felix	35	108	100	60		No data
72	2025/6/10 21:45	66695	beam	On		2 min			All Felix	35	108	100	60		DAC0=35
73	2025/6/10 21:47	66699	beam	On		2 min			All Felix	40	108	100	60		DAC0=40
74	2025/6/10 21:54	66700	beam	On		2 min			All Felix	40	108	100	60		DAC0=40
75	2025/6/10 21:50	66702	beam	On		2 min			All Felix	30	108	100	60		DAC0=30
76	2025/6/10 22:01	66703	beam	On		2 min			All Felix	30	108	100	60		DAC0=30
77	2025/6/10 22:05	66706	beam	On		2 min			All Felix	25	108	100	60		DAC0=25
78	2025/6/10 22:07	66707	beam	On		2 min			All Felix	25	108	100	60		DAC0=25
79	2025/6/10 22:12	66708	beam	On		2 min			All Felix	20	108	100	60		DAC0=20
80	2025/6/10 22:15	66709	beam	On		2 min			All Felix	20	108	100	60		DAC0=20
81	2025/6/10 22:17	66710	beam	On		2.5 min			All Felix	15	108	100	60		DAC0=15
82	2025/6/10 22:20	66711	beam	On		2 min			All Felix	15	108	100	60		DAC0=15 : DAC0 scan ended.
83	2025/6/10 10:28	66712	beam	On		1 min			All Felix	30	108	100	60		DigCon test: 1040->1060
84	2025/6/10 10:30	66713	beam	On		1 min			All Felix	30	108	100	60		10C0->10E0
85	2025/6/10 10:36	66714	beam	On		1 min			All Felix	30	108	100	60		"0000"
86	2025/6/10 10:41	66715	beam	On		1 min			All Felix	30	108	100	60		Custom DigCon
87	2025/6/10 10:43	66716	beam	On		1 min			All Felix	30	108	100	60		Config Again Custom DigCon

Commissioning step in the early phase

- ✓ 1. Confirmation of time in
 - Rough L1delay scan. Other parameters (n_collisions, open_time, DAC values, ...) are fixed.
 - BCO diff plots will be made with Joseph's quick viewer, then we will judge by eye.
 - [Ryotaro](#) analyze the scan data in a short time. He can reuse the analysis codes which was used in the timing scan analysis for pp.
- ✓ 2. Quick check of INTT data: hit correlation
 - Once time in is confirmed, we need to check the data quality.
 - Inner-outer barrel correlation in the number of hits/clusters.
 - [Itsuka](#) is preparing the analysis
- ✓ 3. Quick check of INTT data 2: GL1 matching
 - [Genki](#) will check the GL1 matching with the same analysis codes.
4. z_{vtx} reconstruction
 - Nowadays, z_{vtx} reconstruction is (relatively) easy option for us.
 - [Mahiro](#) is preparing the z_{vtx} reconstruction. We may show together with z_{vtx} , MBD.
5. Event mix-up, hit carry over study
 - Good data with a standard configuration can be used for the study of event mix-up and hit carry over.
 - [Ryotaro](#) inherited analysis codes from Chang-Wei and is preparing for the analysis.
6. Digital control optimization
 - ✓ • Data taking by [Takahiro](#).
 - [Tomoki](#) analyzes the data.
7. Hot channel map study
 - ✓ • Updating the online hot channel map to kill the chips without bias (type-B, ladder 6, intt4).
 - Data taking data without the online hot channel map to see the status.

More menu

Task	Person in Charge	Duration	Points	Beam condition	Other subsystem	Priority	Field	Trigger	Comment	code	plot
Chip saturation study	DAQ: 1008 guys Analysis: Ryotaro Support: Cheng-Wei	10 mins for each	INTT in trigger mode Different open time 25, 40, 60, 80, 90, 110, 127 moderate ncollision, 2, 50, 100 If possible we need the long GTM busy window for this test	with collisions (with low rate)	With MBD, in global mode	High	Any	MBD	This is to study the chip hit saturation issue discovered on Dec 10 2024. Whether we still see the cutoff in the chip nhit distribution even with the open time of 128 BCO? We also need to check the cluster phi size distribution We can also try to learn the correlation between the open_time and nhits	https://github.com/ChengWeiShih/INTT/tree/main/general_codes/CW/Shih/INTTRawHitSanityCheck	
Carried over hit study	DAQ: 1008 guys Analysis: Ryotaro Support: Cheng-Wei	30 mins	INTT in trigger mode moderate open_time (80 or 128) ncollision 1 or 2 or 3 Short GTM busy window for this test	with collisions (with high rate)	With MBD, in global mode	High	Any	MBD	As of Nov 25 2024, I think we never have the dataset with very narrow ncollision for the event-mixed-up study With the statistic approach, in the reality, we just cannot distinguish b/w mix-up hits and the hits from real collisions. So it's good to have such a dataset that we have the potential to believe that any abnormal behavior found in the data can be really came from anything other than the really collisions. In addition, by comparing with the previous dataset with ncollision 100, we can possibly learn where the event mixup happened.	https://github.com/ChengWeiShih/INTT/tree/main/general_codes/CW/Shih/INTTRawHitSanityCheck	
Timing coarse delay scan	DAQ: 1008 guys Analysis: Ryotaro Support: Genki	5 min x 6 points x 2 sets	lv1 = 112, 113, 114, 115, 116, 117	With collisions	With MBD, standalone	High	Any	MBD	After GTM is finalized	Under development by Ryotaro	
DAC0 scan	DAQ: 1008 guys Analysis: Nao Support: Akitomo	5 min x 6 points x 2 sets	DAC0 = 15, 20, 25, 30, 35, 40	better to be with beam	Standalone	Middle	Any	MBD	Better to take data in the same condition as Run2024 Au+Au commissioning, i.e. with Au+Au beam, with other subsystems on.	Under development by Nao	
Digital control test	DAQ: Takahiro Analysis: Tomoki Support: Itaru	5 min x 2 points x 2 sets	Digital Ctrl = 2, 10	With collisions	Standalone	High	Any	Any	First try the digital control test with pedestal data with no collisions. If it's not successful, retry to take data with collisions.	Under development by Tomoki	
Renew chip/channel mask	DAQ: 1008 guys Analysis: Jaen Support: Rachid/Raul	1 min w/ FA	Need some iterations	With collisions	Standalone	Must	Any	Any	Can be finished before Au beam comes. This work will should be performed AFTER 1 week of stable data taking using the current mask condition. Also need Raul to unmask FELIX chip masking		
Single bunch crossing	DAQ: 1008 guys Analysis: ?? Support: ??	10 mins?	one run ncollision 100 one run small ncollision	single or two bunch crossing(s) with collisions	Join the MVTX commissioning	Low	Any	Any	We never join the MVTX commissioning data taking. I think it's a good idea to take at least one run with single bunch crossing or five. We can learn the noise level and also the beam background, and also fraction of the hit moved to the next bin		Normalized ADC distribution
Hit rate study with/without collar	DAQ: 1008 guys Analysis: ?? Support: ??	10 mins?	one run ncollision 100 one run for each configuration small ncollision	single or two bunch crossing(s) with collisions	Join the MVTX commissioning	Low	Any	Any		?	Normalized ADC distribution

When can we declare the end of commissioning?

[Link](#)