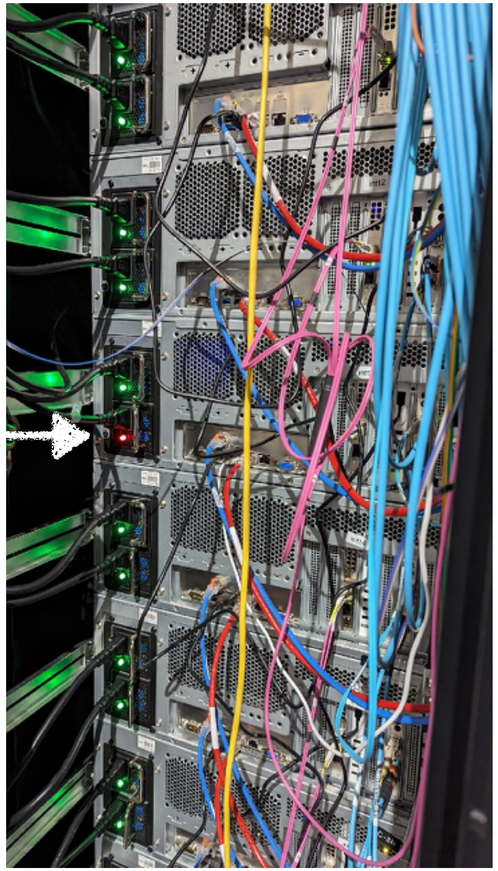
Activities in the last 7 days at BNL

Itaru Nakagawa, Rachid Nouicer, Maya Shimomura,
Rob Pisani, Genki Nukazuka, Raul Cecato,
Cheng-Wei Shih, Jaein Hwang, Joseph Bertaux,
Misaki Hata, Hinako Tsujibata, Ryota Shishikura, Tomoya Kato

Overview



July/26 (Wed)
- DAC0 scan (run 23896 - 23923) (many people)

July/27 (Thur)
- GTM firmware update (not INTT)

July/28-30 (Fri-Sun)
- No major activities

July/31 (Mon)
- Timing scan (run 24750 - 24757) (Maya, Cheng-Wei, Jaein, and Genki)

Aug/01 (Tue)
- The magnet incident at RHIC.
- Cosmic ray measurement was attempted but no data. (Genki)
- The breakers for the FELIX servers were found to be fixed. (Rachid)
- The FELIX server intt3 showed a problem with its secondary power supply module. It will be replaced. (Rachid)
- Joseph gave a talk at RHIC/AGS annual users meeting.

Aug/02 (Wed)
- The breakers were fixed. (Rachid)

Aug/03 (Thur)
- INTT LAD2 chiller stopped ~10:00 AM. Rob and Rachid contacted. Rob restored chiller around 12:15 (Rachid and Rob)
- The new cosmic trigger by HCAL was introduced (E-Log). It's good for INTT. (not INTT)
- Jaein showed a poster at RHIC/AGS annual users meeting.

July/26/2023 DAC0 scan

by Itaru, Maya, Genki, Cheng-Wei, Jaein, Misaki, Hinako, Ryota, and Tomoya

E-Log

Goal

- collecting the latest DAC0 scan data

The measurements

- Runs: 23896 - 23923
- The collision timing difference by 2 BCO was found at the beginning of the measurements.
  - The firmware update on GTM was the reason.
  - MBD was also affected but had not been modified at that time.
- performed with modebits = 92 and n_collisions 4. It was not the finest configuration since we didn't know the cause of the timing difference. So we decided to run with a wider time window.
- Jaein analyze data.

Time	Run	Run Length (min)	DAC0	Rate(Hz)	Comment
04:08	23911	5	18	900	single BCO peak
04:15	23912	5	17	950	single BCO peak
04:25	23913	5	16	980	single BCO peak
04:33	23914	5	15	1000	single BCO peak
04:43	23915	5	14	1050	
04:54	23916	5	13	1070	
05:00	23917	5	12	1100	Data process done
05:17	23919	5	11	1100	
05:25	23920	0	11	1100	very short run for a test, single BCO
05:30	23921	5	20	1090	
05:39	23922	5	30	1090	
05:48	23923	5	40	1120	

July/26/2023 DAC0 scan

[E-Log]

Run 2023 Log | Run 2023 Shift Checklist | HCAL | EMCAL | TPC | TPOT | MVTX | INTT | MBD | BBOXtest | DAQ | Trigger | Electronics | sEPD | ZDC | T1044_2017 | sPHEN

INTT Logbook

List | New | Edit | Delete | Reply | Duplicate | Find | Config | Help

Message ID: **407** Entry time: **Wed Jul 26 21:08:47 2023**

Author:	Tomoya Kato
Subject:	7/27 DAC0 SCAN

9:39 INTT chillers stats

chil mode/chil state/P out/P in/F out/F in/F rate/FF rate

LAD1 running /clear/17.7/18.6/17.3/16.4/5.09

LAD2 running/clear/17.6/18.4/20.6/15.7/5.38

Today's purpose: DAC0 Scan with local mode

21:49 rcdaq_intt2 Connection refused

23:23ãCCrcdaq_intt2's problem was resolved. Jaebeom solved the problem.

23:24 trigger live doesn't appear in the LL1 trigger control display.

24:21 trigger live appears. Jaebeom solved the problem.

24:21 timing changed

0:53 INTT turned off

1:03 Raul changed the polarity to the default setting. Then we turned on INTT.

1:29 We changed the mask file

1:50 beam lost

around 0:20 The magnets had already begun to decrease in current value.

2:58 INTT trun on .

3:30 INTT trun off

Time	Run	Run Length (min)	DAC0	Rate(Hz)	other settings	Comment	result
0:27	23896	1	15	1000	default /n_collisin =4.	confirm time in	time in 1 6 4. entries is 1~8x10^6
0:30	23898	1	15	1000	default	confirm time in	process crash
0:36	23900	1	15	1000	default	confirm time in	
0:38	23901	1	15	1000	d	confirm time in	sprit
0:41	23902	1	15	1000	d	confirm time in	time in /but our sweet spot is 89. sweet spot moved
1:08	23903	1	15	1000	d	confirm time in	process crash
00:00	23904	1	15	1000	d	same	The timing is in 2BCK.
01:21	23905	5	18	1000	d	Dac0 Scan	we don't change mask file .so we can't use this run
01:36	23906	5	18	1000	d	same	timing is in 2BCK
01:43	23907	5	17	1000	d	same	timing is in 2BCK
3:05		5	18	1	1	@	new fill
04:08	23911	5	18	900		single BCO peak	
04:15	23912	5	17	950		single BCO peak	
04:25	23913	5	16	980		single BCO peak	
04:33	23914	5	15	1000		single BCO peak	
04:43	23915	5	14	1050			
04:54	23916	5	13	1070			
05:00	23917	5	12	1100		Data process done	
05:17	23919	5	11	1100			
05:25	23920	0	11	1100		very short run for a test, single BCO peak	
05:30	23921	5	20	1090			
05:39	23922	5	30	1090			
05:48	23923	5	40	1120			

July/31/2023: Timing scan

by Maya, Genki, and Cheng-Wei

E-Log

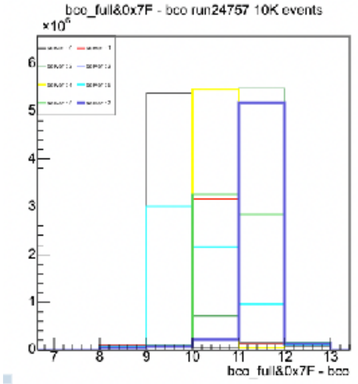
Goal

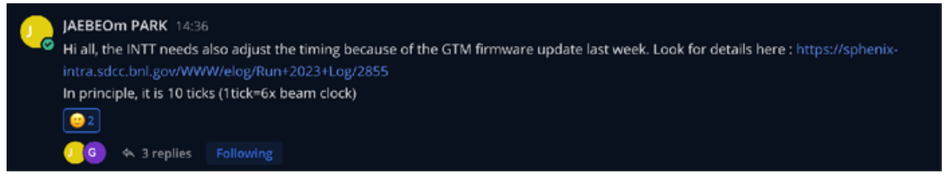
- Let INTT timed-in because the timing was changed by the GTM firmware update.

The measurements

- Runs: 24750 - 24757
- The time difference was expected to be 10/6 BCO ~ 1.7 BCO. TPOT was modified by about 2 BCO.
- We set modebits = 92→95 & n_collisions=4.
  - The narrowest setting was modebits = 94 & n_collisions =2. Since the behavior of the (BCO full&0x7F - BCO) was different from our understanding, we set a wider window.
- The minimum attendance, Maya, Cheng-Wei, and Genki, successfully finished the scan in 2 hours.

Time	Run	Run Length (min)	n_collisions	mode bits	DAC0	Rate (Hz)	Comment
01:21	24750	2 mins	4	92	15	300	Global mode, rate : live rate. INTT3 no data, high current
02:09	24750	2 mins	4	92	15	1.4k	Local mode, rate : live rate. INTT3 same (The previous run is over written somehow !) Maybe not written (N entry the seems to be the
02:29	24751	1min	4	92	15	1.5k	INTT3 Off
02:35	24752	1 min	4	95	15	0	INTT3 Off -> No data. We may lose the trigger (MBD no running)
02:48	24753	1 min	4	95	15	1.5k	INTT3 Off. The rest servers have > 2.5M hits. seems to be timed in (GOOD)
02:59	24754	1 min	7	95	15	0	INTT3 Off -> No data. We may lose the trigger (MBD no running)
03:04	24755	1 min	7	95	15	1k	INTT3 Off The rest servers have > 2.5M hits. seems to be timed in (GOOD)
03:11	24756	1 min	127	95	15	500	INTT3 Off : try to check whether we see other peaks or not (GOOD, no second peak, but the dist. shape changes a bit.)
03:19	24757	1 min	4	95	15	1.5K	INTT3 Off. FInal confirmation (GOOD)





July/31/2023: Timing scan

E-Log

413	Mon Jul 31 22:32:46 2023	Cheng-Wei, Genki & Maya	INTT time in check

We realized that once the GTM firmware is updated, it may effect the delay. Since we are trying to reduce the n_collisions, we get the junks if the delay shifts the signal peak out of the the wind

We better redo the time in scan to check it.

Beam was aborted.

Aug 1st

1:00 am Physics declare.

1:30 am found that INTT3 has no data. the RC-6S RC-7S high current ~ 18.5A

1:30 am reboot the system LV & HV. The INTT3 LV current is still high. Give up INTT3 for the moment.

2:10 am Use the expert HV GUI to turn on the HV except the INTT3 ROCs -> so, only 7 servers are running.

-> The plan is to do the time in scan with 7 servers. If the 7 servers are timed in, most likely the INTT3 can be timed in with same config.

-> We leave this confirmation test to the shift crew.

3:53 am
try to recover INTT3 : by following Jaein's instruction https://sphenix-intra.sdcc.bnl.gov/WWW/run/2023/INTT/

3:55 am

reboot the INTT LV. INTT3 still high current.

3:56 am
So we set the running config back (INTT3 LV HV off)

Time	Run	Run Length (min)dsa	n_collisions	modebits	DAC0	Rate (Hz)	Comment
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00:00	00000000	1	1	1	1	1	@
00:00	00000000	1	1	1	1	1	[
00:00	00000000	1	1	1	1	1	a
00:00	00000000	1	1	1	1	1	s

The magnet incident at RHIC

sPHENIX-I <sphenix-l-bounces@lists.bnl.gov> が David Morrison via sPHENIX-I <sphenix-l@lists.bnl.gov> の代理で送信
宛先: sphenix-ec-l@lists.bnl.gov; sphenix-l@lists.bnl.gov

2023/08/03 (木) 11:41

ATT00001.txt
454 バイト

Dear sPHENIX EC, collaborators,

As you know, earlier this week there was an incident at RHIC in which a LHe valve box that is part of the blue ring cryogenic system broke and then uncontrollably vented a significant amount of liquid helium. As a result, the blue ring is no longer cold and C-AD has been off-loading helium to its tank farm. Experts are preparing to inspect the damage and then to develop a plan and timescale for repair. C-AD Chair Wolfram Fischer has said that it may take a week before they can assess the situation fully.

Gunther and I met about an hour ago with ALD Haiyan Gao and Physics Dept. Assoc. Chair Jamie Dunlop to discuss the situation and possible options for going forward. We emphasized that the sPHENIX collaboration is well prepared to make use of additional Au+Au beam time in Run-23 if the repairs can be made expeditiously.

Haiyan presented two scenarios: one in which an attempt is made to continue Run-23 (i.e., the RHIC cryo-plant continues to operate) and C-AD works to repair the damage in M weeks and provide N additional weeks of Au+Au beam, if repairs can be completed in time. Both M and N are highly uncertain. In the alternative scenario Run-23 is ended essentially immediately, and the operating funds are "banked" and used to add weeks of beam time prior to the currently scheduled start of Run-24.

We pointed out that this second scenario is also highly uncertain -- at a minimum it requires DOE ONP to allow the carrying over of operating funds.—We noted several other questions that we would need C-AD guidance on in order to allow the collaboration to make an informed, rational decision. For instance, in Haiyan's second scenario, one could imagine wanting to start with Au+Au and then switch to p+p. We would want to hear from C-AD about the costs, in terms of cryo-weeks, of choosing to do that.

The ALD is pressing for a rapid decision, on the premise that this maximizes the possible carryover. She said she wants to make a decision by COB this Friday.

We are scheduling a discussion on Friday at 1pm in the General Meeting time slot, following the end of the RHIC AUM, to inform our response to the ALD. We will provide as much reliable, updated information as we can prior to the discussion. We ask all EC members to attend if at all possible, and invite all collaborators to participate in the discussion.

Regards,
Dave and Gunther

--
David Morrison Brookhaven National Laboratory phone: 631-344-5840
Physics Department, Bldg 510 C fax: 631-344-3253
Upton, NY 11973-5000 email: dave@bnl.gov

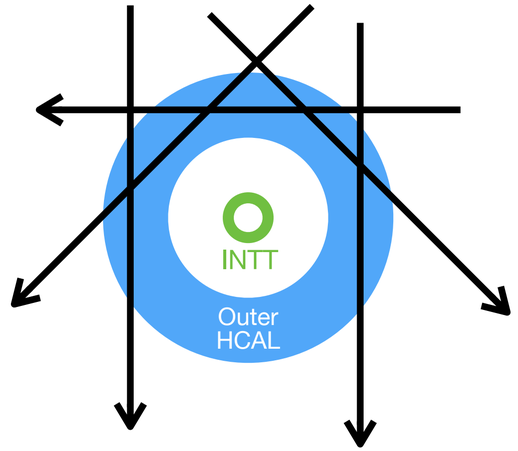
Ventilation of helium from building 1004B.

The physical damage on a liquid helium valve box for the blue ring cryogenic system stopped RHIC operation. Repair takes time, but the actual estimation of time was not given yet.
sPHENIX continues activities without a beam anyway.

Cosmic ray measurements

In the current situation, no beam is expected for a long time, cosmic ray measurements are good activities as a part of commissioning.
We tried the measurement Aug/01 evening but could get no data. We need help from Raul. He is currently on vacation and will be back next week (probably).

Cosmic triggers
The cosmic trigger, which had been used, was implemented for HCAL energy calibration (400 Hz). The trigger selects events with higher energy deposit than the threshold.
It enhances #events with cosmic ray in tangent direction to the barrel.



Dan (and the trigger group) introduced a new type of cosmic trigger (see E-Log). It requires coincident hits to the center of the top and bottom of Outer HCAL. It's better for us. It's about 60 Hz.

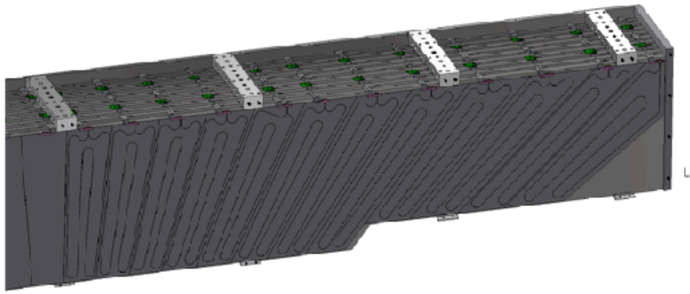
Cosmic ray measurements

Hadronic Calorimeters

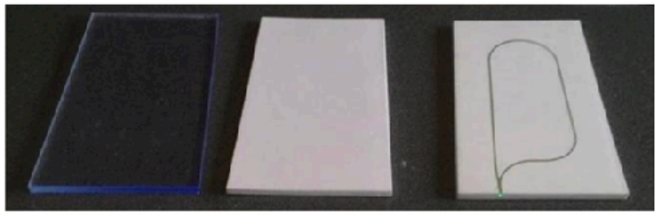
RHIC & AGS Users' Meeting 2023

sPHENIX

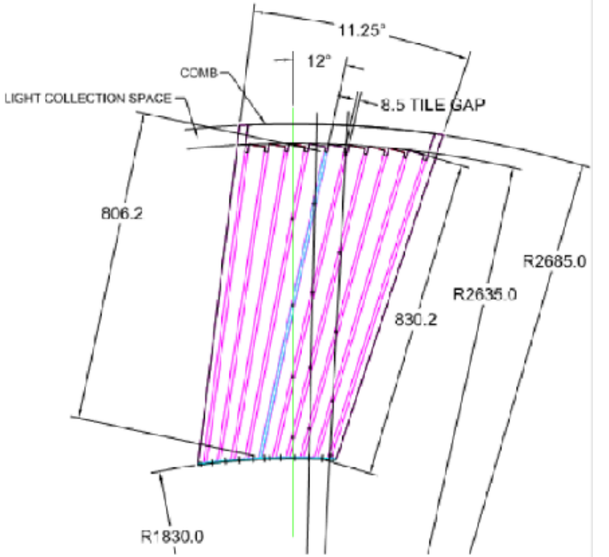
- One oHCal sector has 10 scintillator slots. One iHCal sector has 8 scintillator slots.
- Each slot is filled with 24 tiles along z. Tiles have different sizes and shapes to be projective in η.
- Tower is the collection of tiles. 5 tiles in oHCal, and 4 tiles in iHCal. One sector has 48 towers that separated into two lines.
- Total 1536 towers. Each tower covers $\Delta\eta \times \Delta\phi = 0.1 \times 0.1$. Each HCal tower corresponds to 16 EMCal towers.
- The tiles are tilted in ϕ. oHCal tilts 12° relative to radius, iHCal tilts 32° in opposite direction. Particles from center will pass at least 4 tiles.
- A SiPM is installed on each tile. All 5 or 4 tiles' SiPMs in the same one tower are read out together.



Half of oHCal sector. oHCal scintillating tiles tilted in η from center of barrel



IHCal scintillating production



OHCal scintillating tiles tilted in φ from radius

https://indico.bnl.gov/event/18938/contributions/79104/attachments/48906/83263/sPHENIX_Calorimetry_RHIC_User_Workshop.pdf