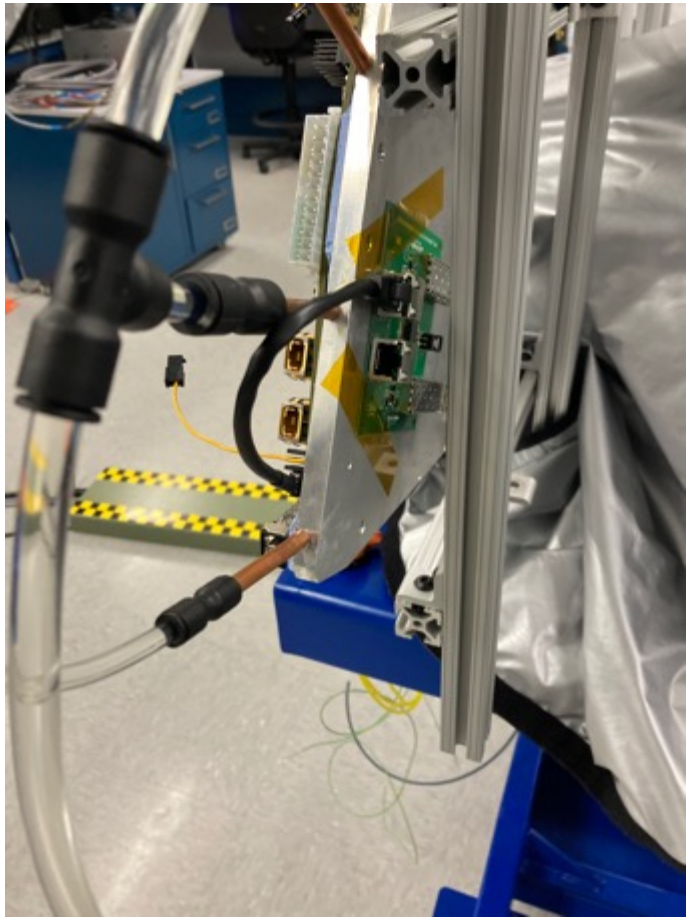
Status and Schedule

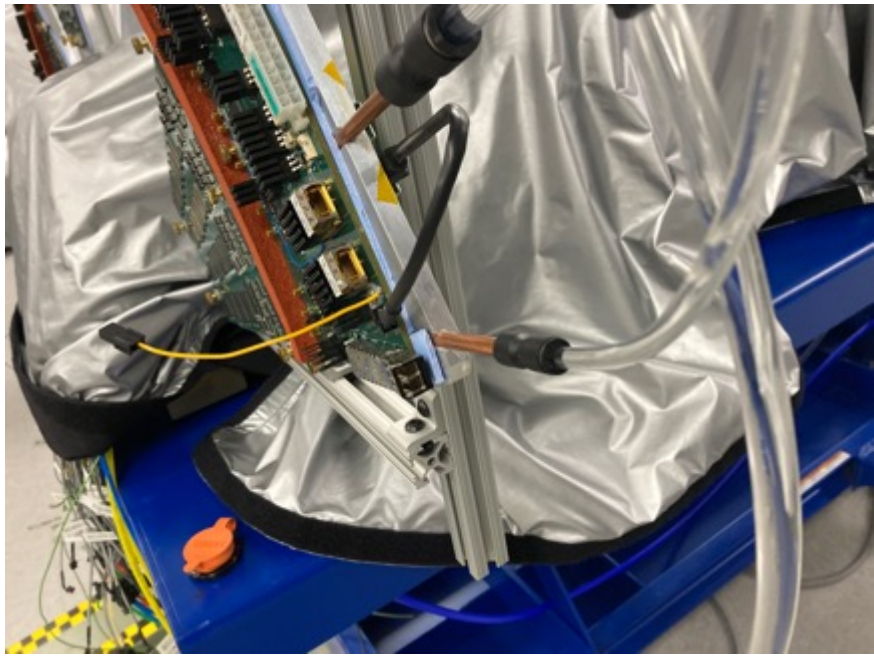
RBRC
Itaru Nakagawa

Production Conversion Cables

- Final checkout of assembled cables in Hayashi-REPIC and they are to be delivered to RIKEN next week on schedule.
- Itaru started exporting paper works so that cables are forwarded to BNL.

Beam Clock Cables

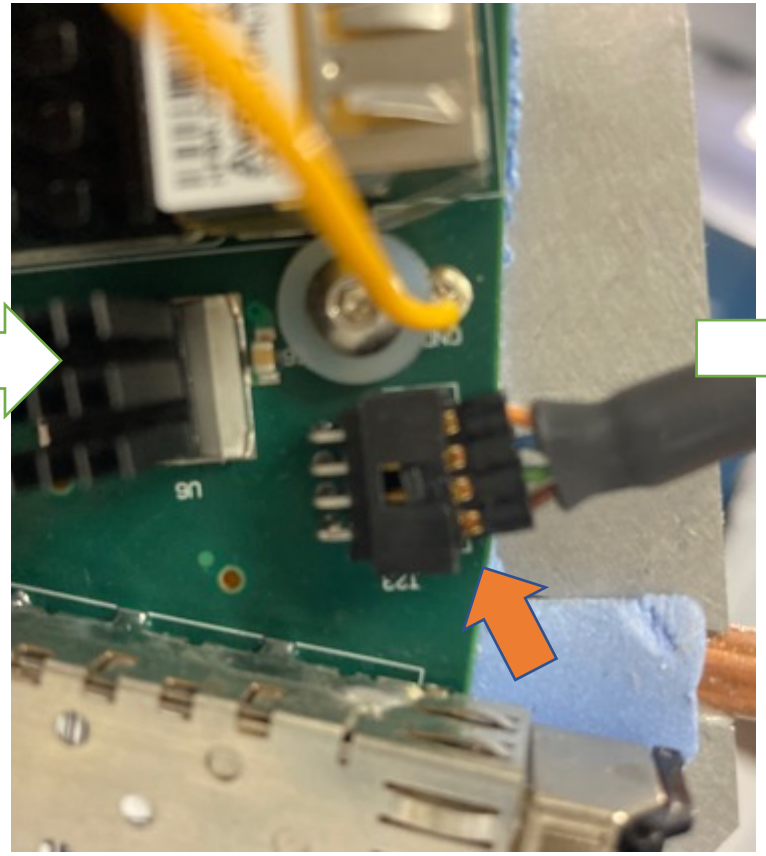




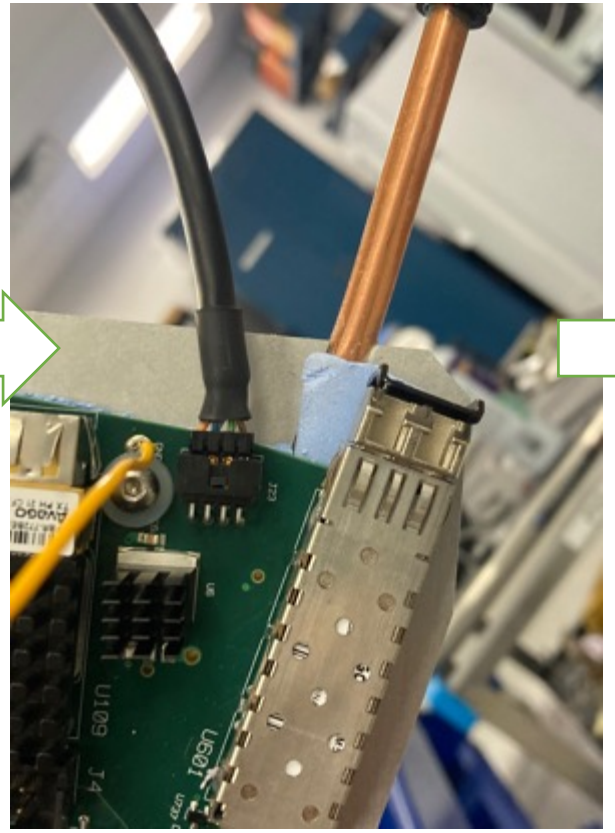
Installation test pursued with Dan Cacace.
The cable length is confirmed to be OK.
Stress is reasonably minor.

Beam Clock Cable Stress Test

Day-0



Day-1 (22hours later) became loose.
Pushed the connector all the way in.



Day-5

Day-6

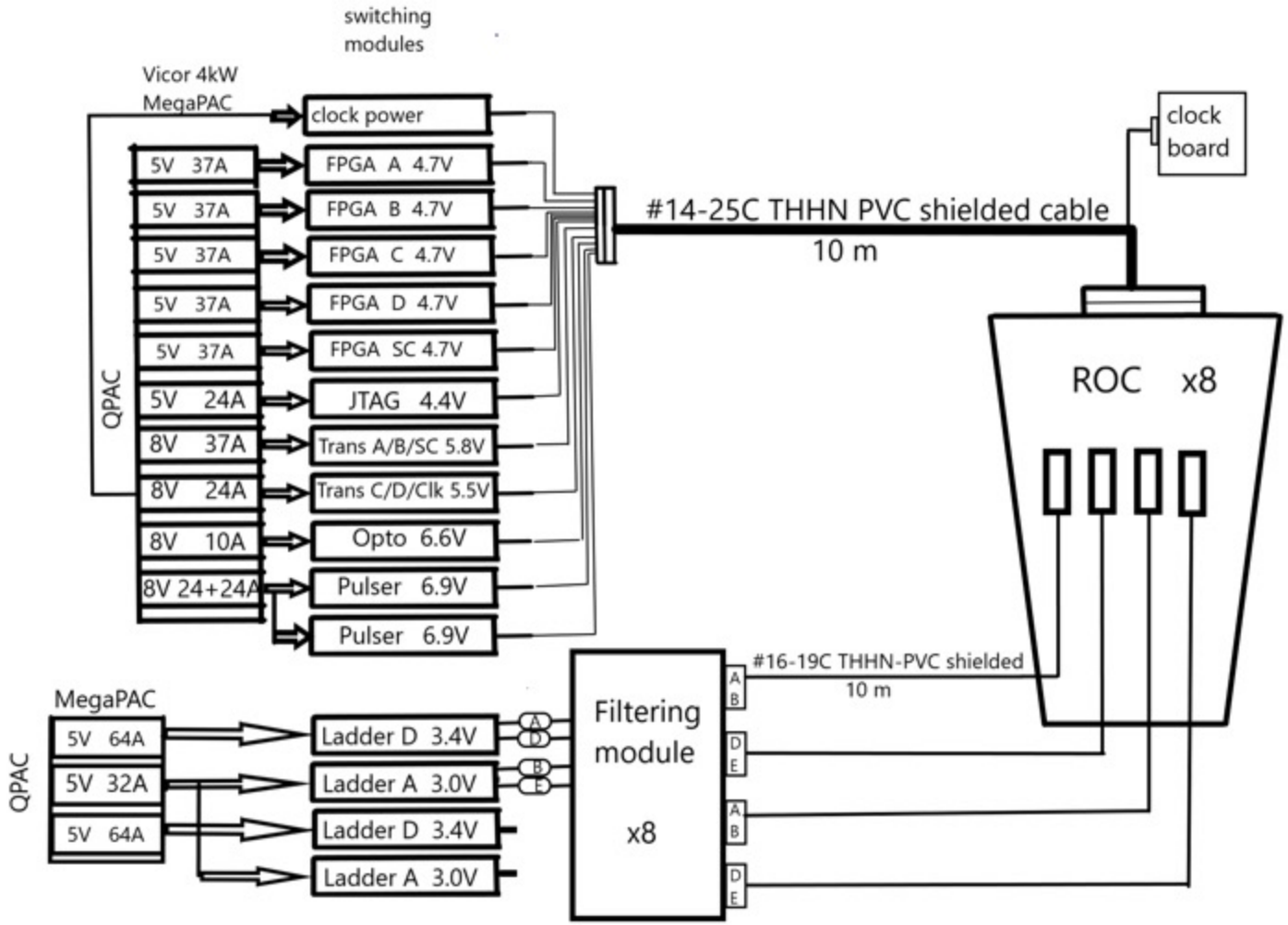
The connector became loose on the next day though, the stress seems to be relaxed as the time goes by. Dan may consider encapsule the connector area with a kind of glue.

LV System Development

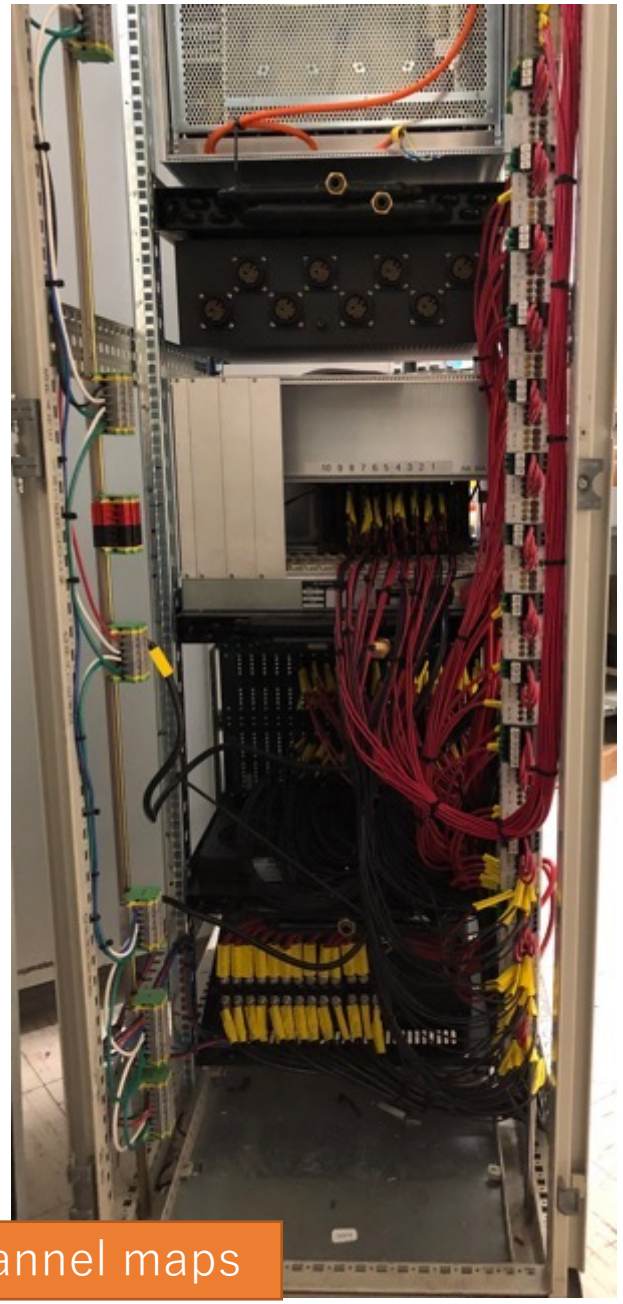
ROC power scheme

Need to turn on 11 channels/ROC&BCB

Switching Module



INTT racks, rack #1 front and back and rack #2 front and back (left to right)



Bias crate

Bias Filter box is in → construction

LV filter crate

Switching crate

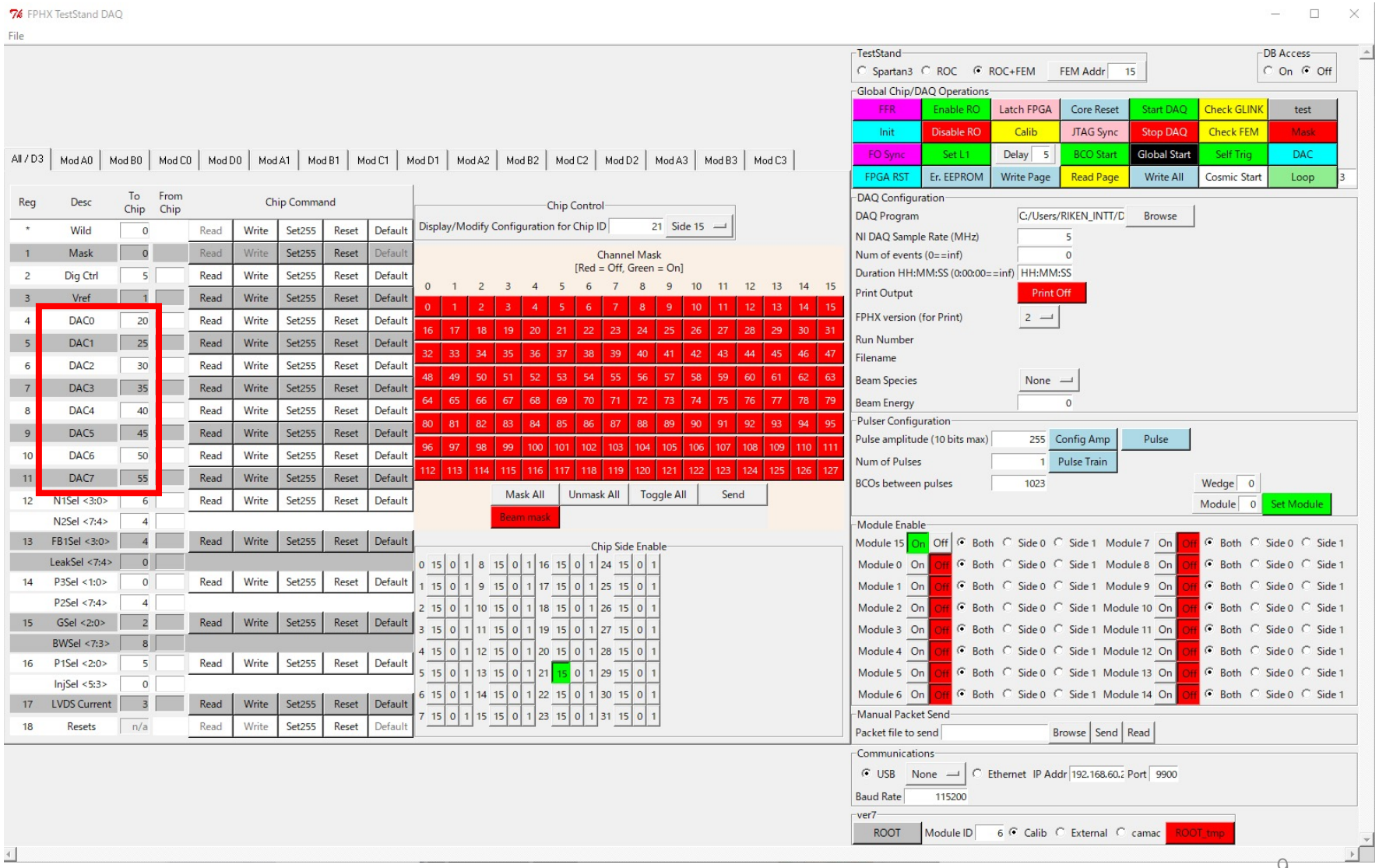
Vicor MegaPACs

Need to develop channel maps

New DAC Setting

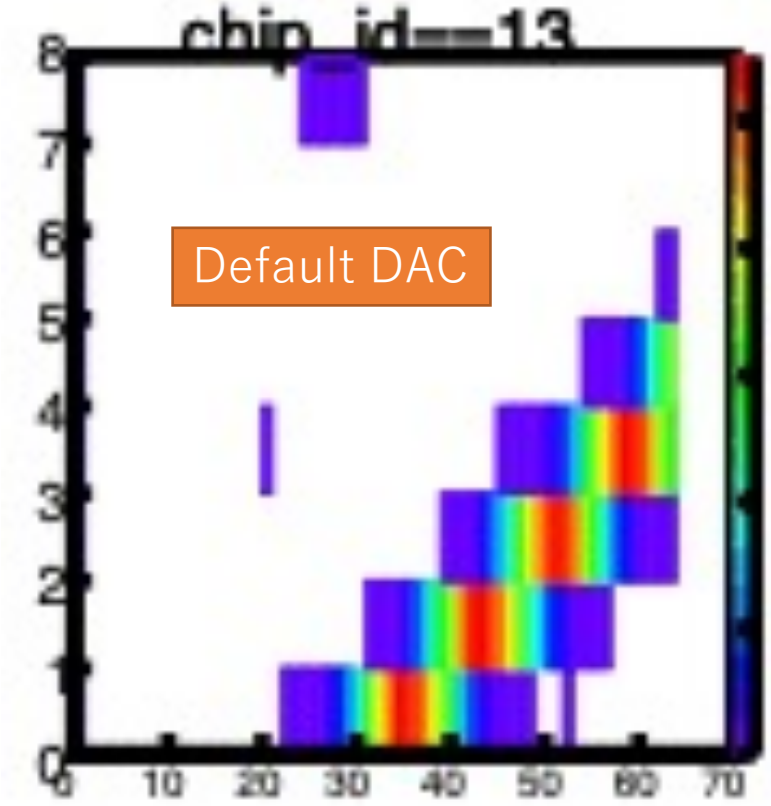
Optimized DAC Setting for INTT Calibration

DAC	Default	New
0	20	15
1	25	19
2	30	23
3	35	27
4	40	31
5	45	35
6	50	39
7	55	43

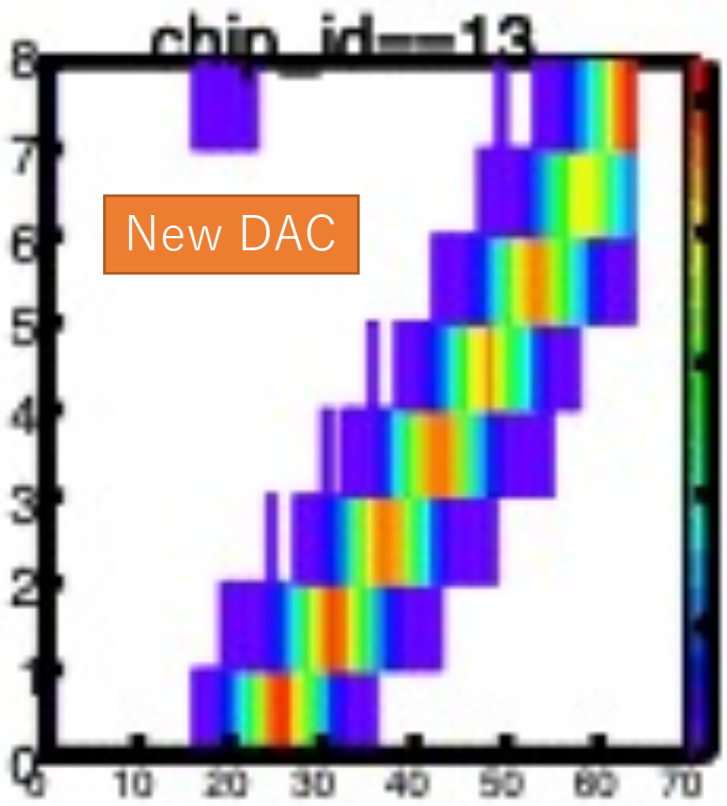


New DAC Setting Result

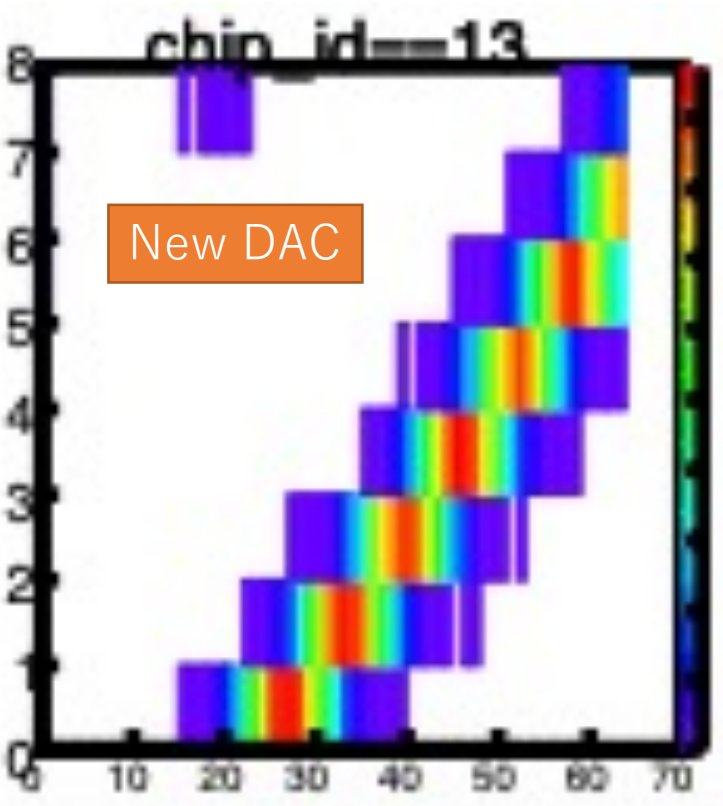
INTT+BEX+μ-Coax



INTT+μ-Coax

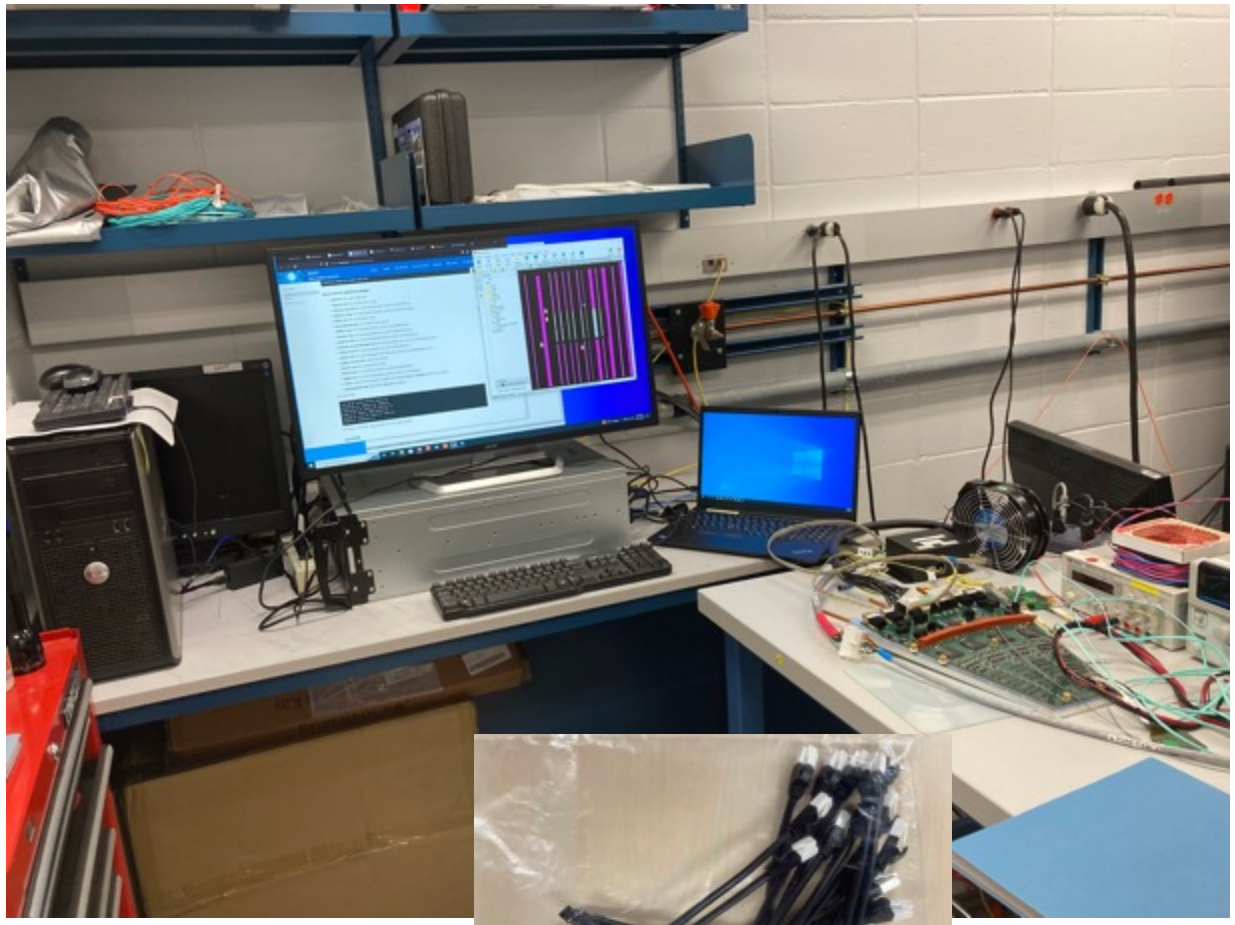


INTT+BEX+μ-Coax



Measurements by Rikkyo Undergraduates

2nd Felix Test Bench Preparation



- Decoupled from Raul's development and now allocated dedicated machine for users to test as originally aimed.
- Loaded FPGA code with the latest stable version.
- Waiting for Raul to setup a spare fiber and cassette.
- Other components are ready.
- To be started data taking from next week.
  - **New DAC setting** for the calibration
  - 24 production beam clock cable test
  - Analysis on the felix server
  - Slow control command tests
  - Calibration database development
  - Readback test (once SC-FPGA @ ROC is ready)
  - Preparation for cosmic ray data taking (requires firmware upgrade by Raul).

sPHENIX End Game Review

Oct 13, 2022, 10:00 AM → Oct 14, 2022, 5:00 PM US/Eastern

Description https://bnl.zoomgov.com/j/1605049719?pwd=cTQxNkR0TGhaSHB3TGJybWNqc1VGUT09
Join ZoomGov Meeting

Meeting ID: 1605049719
Passcode:076821

Agenda_Installatio_ | Charge sPHENIX IF_ | Crticial path schedules | Detailed Schedules
Monthly Status Reports | MoU/MoAs | Project Management Plan | Review Committee
sPHENIX KPPs and Deliverables | sPHENIX TDR | Summary Schedules

https://indico.bnl.gov/event/17429/

Thursday, October 13

10:00 AM → 10:25 AM **sPHENIX Status (20+5)** 25m
Speaker: Edward O'Brien (BNL)
sPHENIX_ReviewE...

10:25 AM → 10:45 AM **sPHENIX Organization and Resources (15+5)** 20m
Speaker: Glenn Young (BNL)
Resource Requirem... | Young_Project_Org...

10:45 AM → 11:05 AM **Experiment Expectations in 2023 (15+5)** 20m
Speaker: Gunther Roland (MIT)
EndGameReview_R...

11:05 AM → 11:50 AM **Installation and Schedule (30+15)** 45m
Speaker: Russell Feder (sPHENIX)
2022OCT11_SCHE... | 2022OCT13_sPHE...

11:50 AM → 12:05 PM **Break** 15m

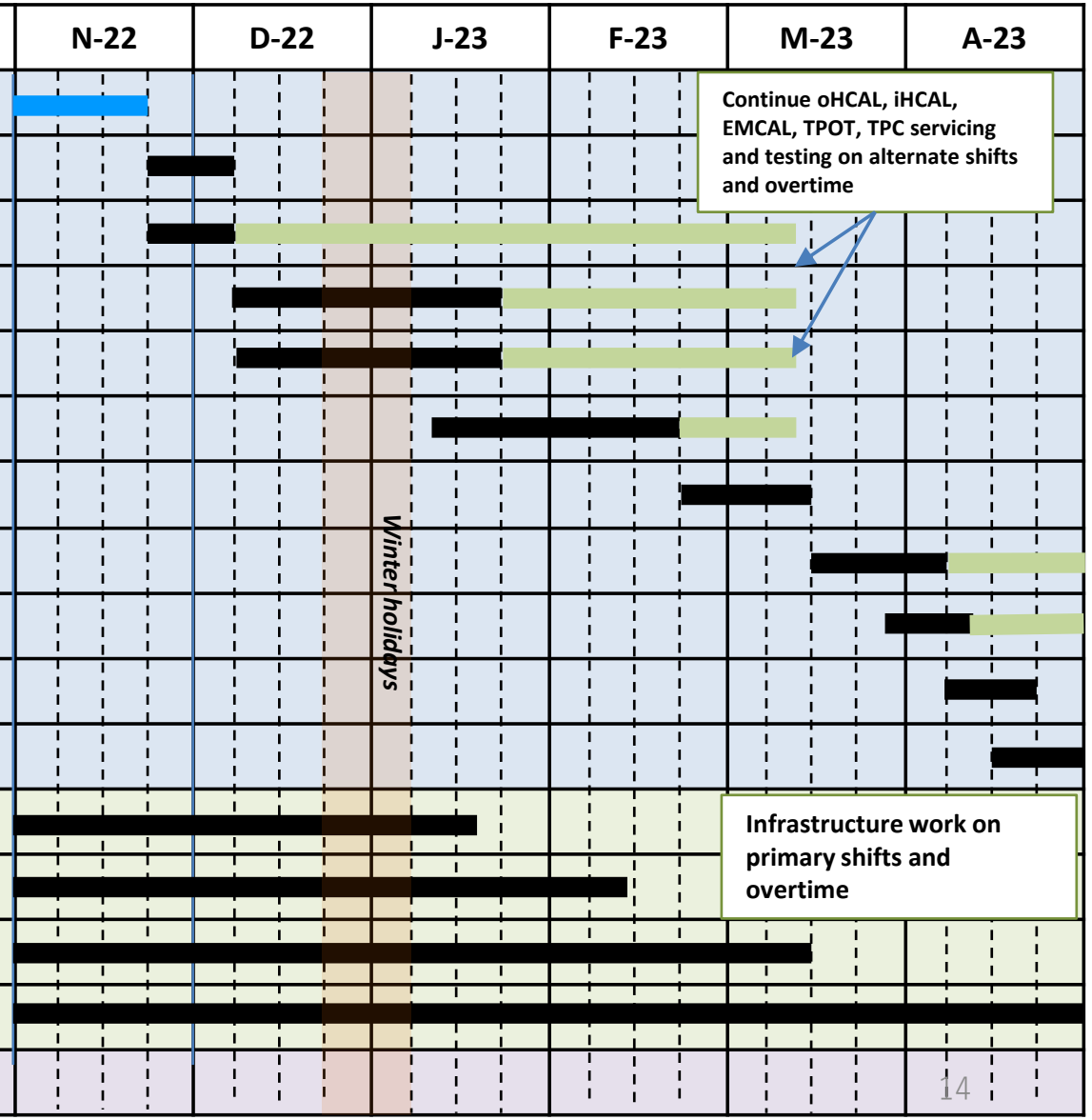
Current Installation Schedule (not P6)

Tasks	Nov 22	Dec 22	Jan 23	Feb 23	Mar 23	Apr 23
Magnet Mapping	3 wks					
Finish Install EMCal/Cable IHCAL		2 wks				
Install/Cable TPOT			6 wks			
Cable EMCal			6 wks			
Install/Cable TPC				6 wks		
Install/Bakeout Beampipe					3 wks	
Install/Cable INTT					3 wks	
Install/Cable MVTX						3 wks
Install MBD						2 wks
Ready for commissioning with beam						

Charge Question # 1

sPHENIX construction schedule after magnet mapping

Sequential Build Steps	Start	End
Magnet Mapping		11/24/22
Complete EMCAL sector installation	11/25/22	12/5/22
iHCAL cabling, oHCAL cabling completion	11/25/22	12/5/22
TPOT, EMCAL-face support frames, TPOT services N&S	12/6/22	1/23/23
EMCAL services north and south	12/10/22	1/23/22
TPC installation, TPC services north and south	1/8/23	2/19/23
INTT support structure, *beam pipe, beam pipe bake*	2/20/23	3/10/23
INTT installation, INTT services north and south	3/17/23	4/5/23
MVTX installation, MVTX services south	3/29/23	4/10/23
MBD, MBD services north and south	4/6/23	4/17/23/23
sEPD, sEPD services north and south, VESDA tubing	4/12/23	4/24/23
Racks and On-carriage AC power	Current	1/20/23
Water infrastructure: ECW and chilled water systems	Current	2/17/23
Gas systems	Current	3/17/23
E-stops, VESDA system, safety systems	Current	4/24/23



Russel's Slide 5

sPHENIX Construction Plan

Prepared by: Rob Michnoff, Russ Feder

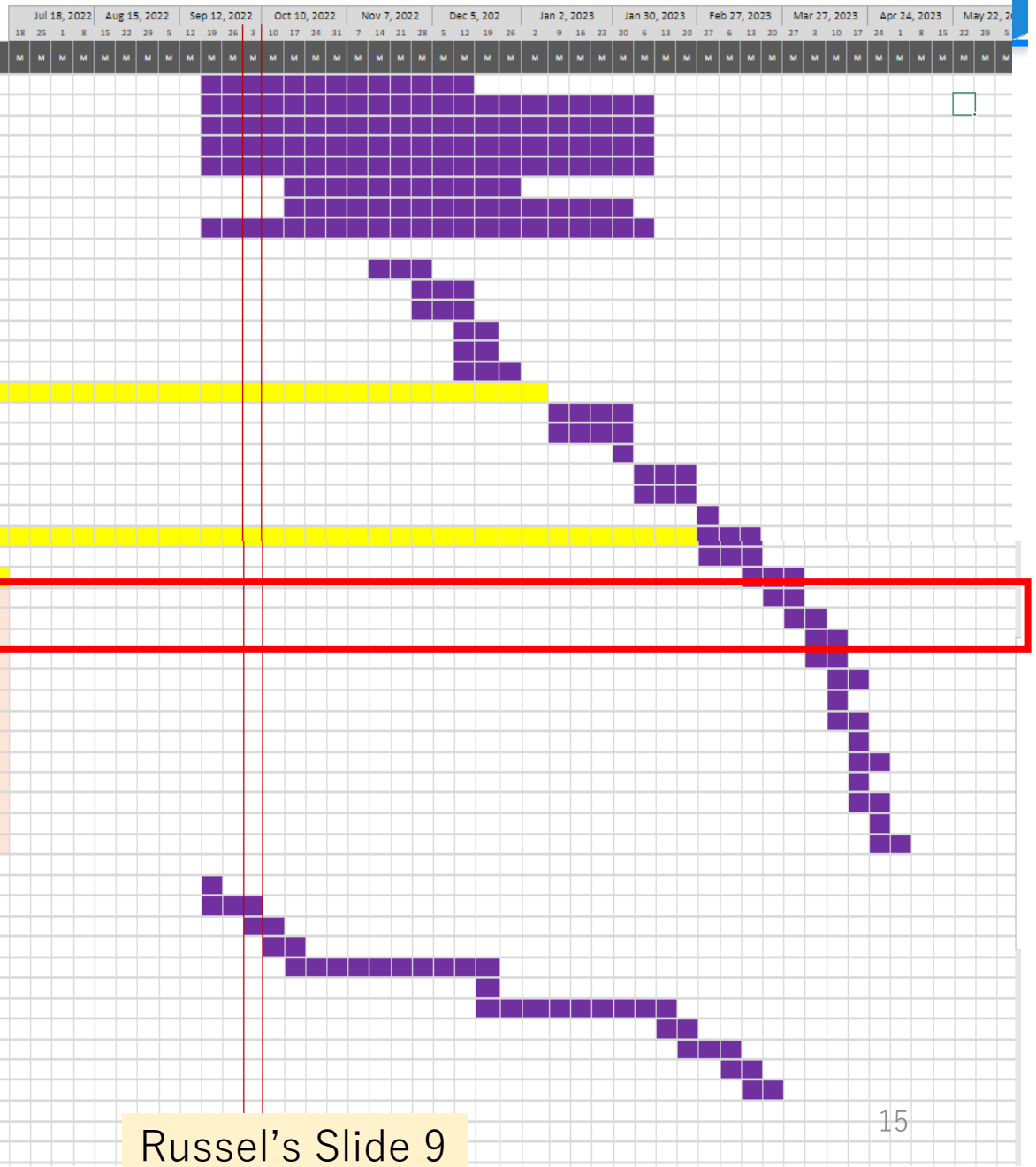
Last edited: 9/13/22

IG-XXXX

Mon, 7/18/2022

1 Days/column: 7

TASK	Who?	START	END	DAYS
Racks mechanical install, oHCAL,, fiber-optic trunk cables	sPHENIX	9/12/22	12/5/22	
Racks power, other on-carriage AC power complete, sensors and interlocks, final power and safety inspecti	sPHENIX	9/12/22	2/4/23	
E-stops, global interlocks, other integrated safety system testing	sPHENIX	9/12/22	2/4/23	
VESDA system and other on-carriage safety systems	sPHENIX	9/12/22	2/4/23	
Gas Systems: Gas house upgrades, gas lines, gas panels on-carriage	sPHENIX	9/12/22	2/4/23	
ECW complete to all racks, test	CA-D	10/12/22	12/25/22	
Chilled water systems: platform, chillers on platform, chilled water piping, water panels on-carriage	CA-D	10/12/22	1/24/23	
Egress decking, East stairs access, East and West L1 scaffolding	CA-D	9/12/22	2/4/23	
Magnet mapping complete		11/11/22	11/24/22	
EMCAL sectors install completion (final 9 rows, 18 sectors)		11/25/22	12/5/22	10
iHCAL Cabling		11/25/22	12/5/22	10
EMCAL face support frames, EMCAL cooling blocks supports, and TPOT complete installation (north)		12/6/22	12/16/22	10
Continue with oHCAL and iHCAL service work on alternate shifts		*12/6/22*	*12/16/22*	*10*
EMCAL and TPOT services south *(start 5 days after last EMCAL)*		12/10/22	12/25/22	15
Collective Weekends and Holiday Pause/Slow-Down/Delays + Sick days and other vacations				
EMCAL and TPOT services north		1/8/23	1/23/23	15
TPC install structures *(concurrent with EMCAL services north,, set up to be ready for TPC install)*		1/8/23	1/23/23	
TPC install (from north)		1/24/23	1/29/23	5
TPC services south		1/30/23	2/14/23	15
TPC services north *(start 5 days after south side servicing)*		2/4/23	2/19/23	15
INTT support structure		2/20/23	2/22/23	2
Beam pipe and beam pipe bake		2/23/23	3/10/23	15
Continue with EMCAL, TPOT, and TPC services in parallel with INTT supports and beam pipe install		2/20/23	3/10/23	*18*
Prep IR for run, Close shield wall and start RHIC run		3/10/23	3/20/23	10
INTT install *(with 1 week IR prep operations delays)*		3/17/23	3/20/23	3
INTT services south		3/21/23	3/28/23	7
INTT services north		3/29/23	4/5/23	7
MVTX installation		3/29/23	4/4/23	6
MVTX services south		4/5/23	4/10/23	5
MBD north installation		4/6/23	4/8/23	2
MBD north services		4/9/23	4/11/23	2
MBD south installation		4/11/23	4/13/23	2
MBD south services		4/14/23	4/17/23	2
sEPD north and VESDA north installation		4/12/23	4/15/23	3
sEPD north services		4/16/23	4/18/23	2
sEPD south and VESDA north installation		4/18/23	4/21/23	3
sEPD south services		4/22/23	4/24/23	2
USI review and final approval		9/14/22	9/15/22	1
CA-D RSC Approval of sPHENIX ACE and SAD		9/16/22	9/26/22	10
LESHC Approval of sPHENIX ACE and SAD		9/27/22	10/3/22	6
ESH ALD sends sPHENIX ACE and SAD to BHSO for approval		10/4/22	10/10/22	6
BHSO approves sPHENIX ACE and SAD		10/11/22	12/12/22	62
Hold sPHENIX IRR		12/13/22	12/16/22	3
Close IRR pre-ARR items		12/17/22	2/10/23	55
Hold sPHENIX ARR		2/11/23	2/17/23	6
Close ARR pre-operations findings		2/18/23	2/28/23	10
Obtain ARR team reccomendations for operation of sPHENIX		3/1/23	3/7/23	6
ESH ALD provides BHSO with ARR reccomendatio		3/8/23	3/14/23	6
BHSO approves sPHENIX commissioning and operation		3/15/23	3/22/23	7
Ready to start sPHENIX				



Russel's Slide 9

Future Testing Plans (2):

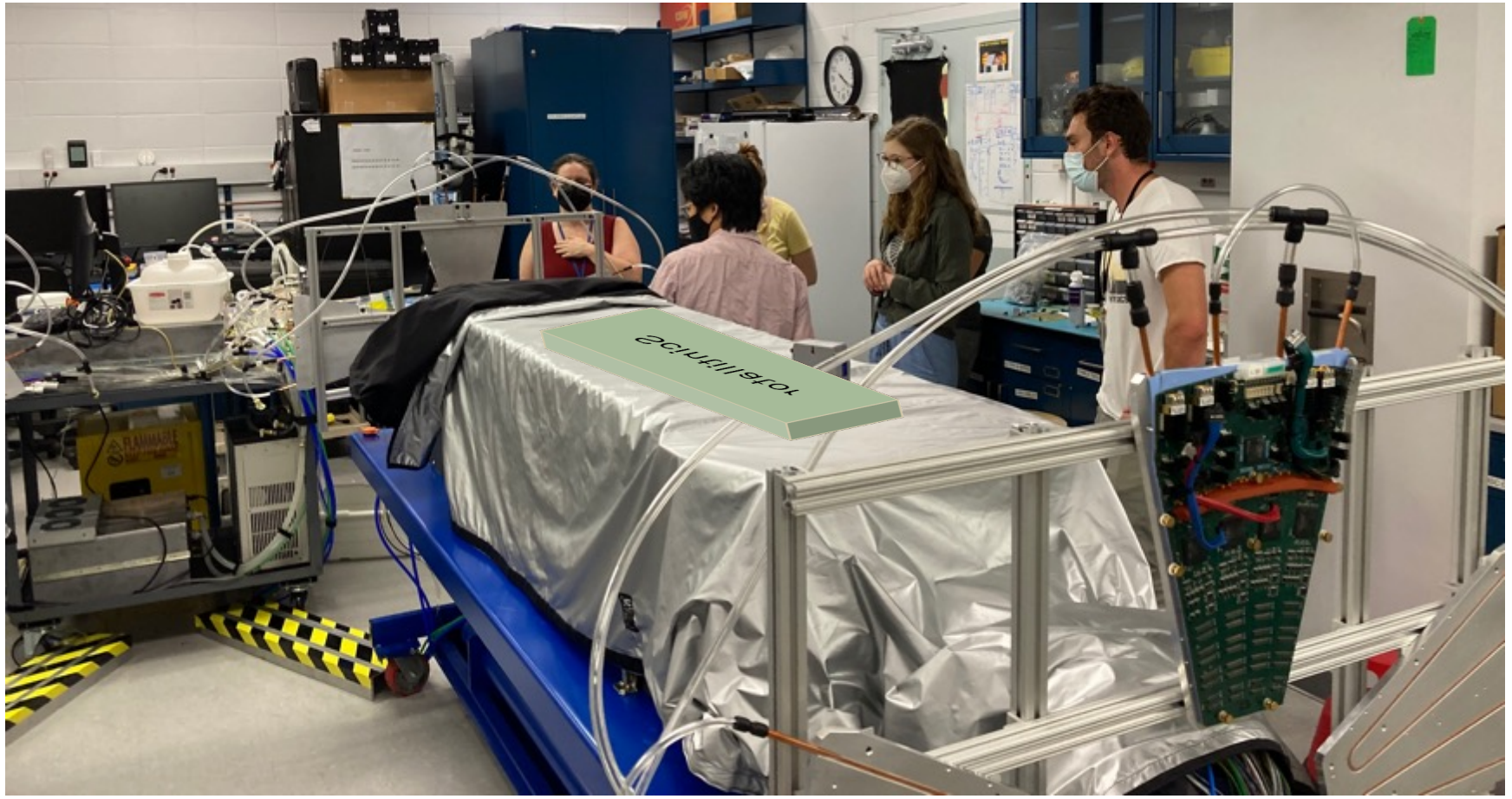
- **Post Integration test in the Lab (Phy-lab 2-82): October 24, 2022**
  - After Integration of the two INTT haves in the lab, the INTT will be moved to the Si-Lab to be fully tested with:
    - Conversion cables (cable detector to ROC: 15 cm),
    - Simultaneous test of two ROCs with Felix readout,
    - Final survey of the two INTT halves.
    - Cosmic-Data and offline Analysis
- **Pre-installation@IR: February 2023**
  - Full INTT test at the sPHENIX-IR assembly hall using INTT bench test: LV/HV/DAQ rack
- **Installation@IR**: **March 17, 2023**
- **Post-installation@IR**:
  INTT integration in the IR: using sPHENIX infrastructure @IR
  - Installation ROCs, optical cables ROCs-IR rack
  - Cooling powered
  - LV/HV racks powered
  - Electrical test of barrels North and South (pulse test calibration)

Rachid's Slide 9

Schedule

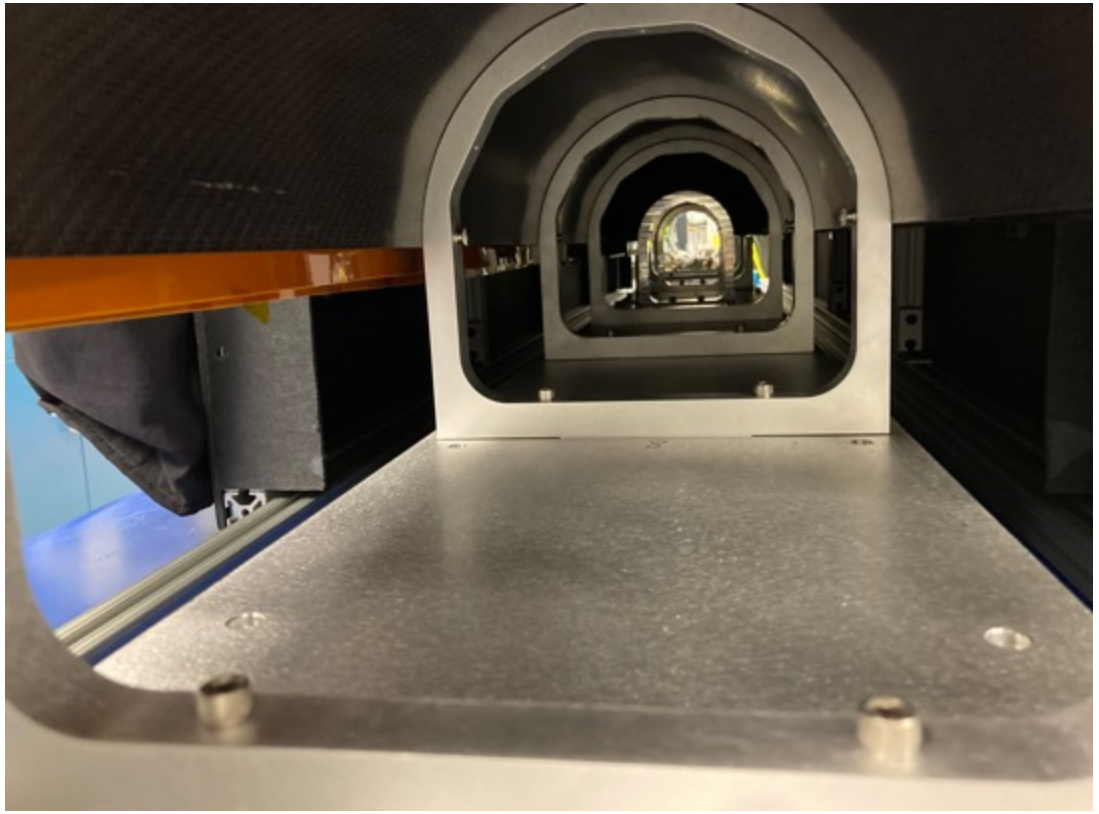
October	November	December	January, 2023	February, 2023	March, 2023
• INTT Integration test in the lab. • Felix Readout development	• INTT full test with conversion cables and Felix readout with two ROC (14 half ladders) • LV/HV Gui development	**Ready for installation** • Cosmic Data and offline analysis in the Si-Lab • LV/HV Gui development	• Cosmic Data and offline analysis in the Si-Lab	• **INTT move to sPHENIX-IR assembly hall** • **Full test using INTT test-bench** • **Installation LV/HV cables to the racks** • **Installation of optical fibers from IR-racks to DAQ at electronic room**	• **INTT insertion: 03/17/23** • **Complete IR installation 04/05/23** • **Commissioning INTT with full readout chain**

Cosmic Ray Data Taking with the Barrel



To be implemented trigger scintillator paddle on top of the barrel.

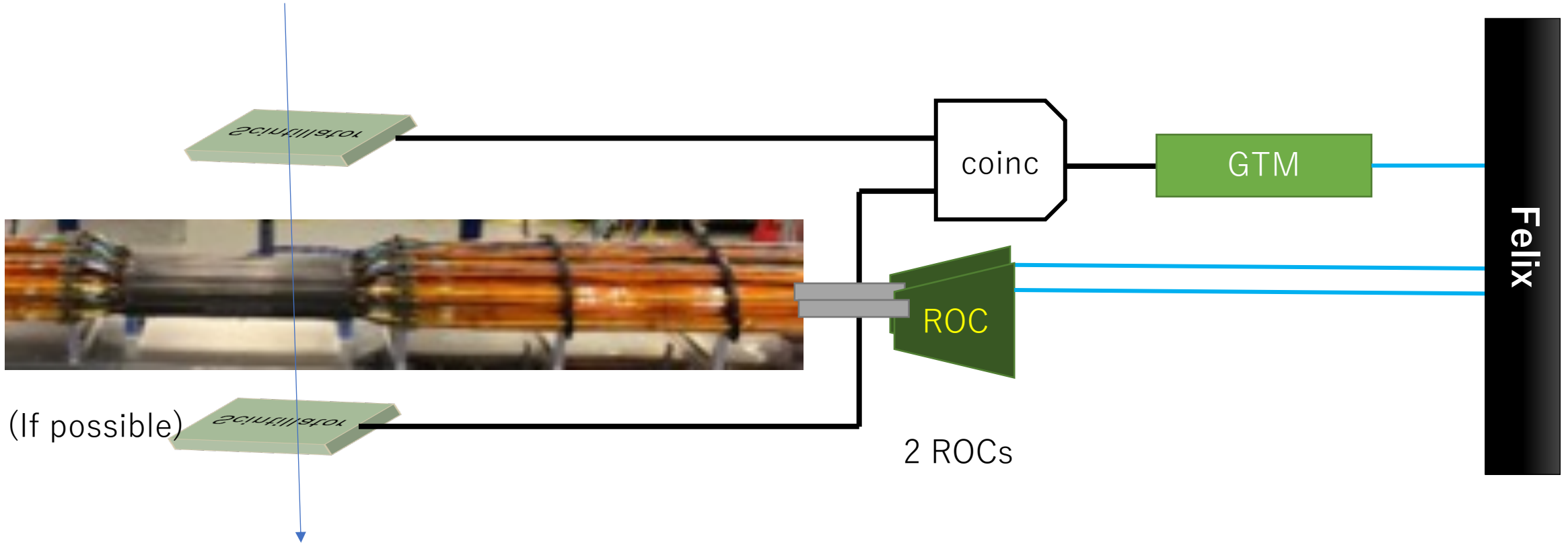
Sandwich Trigger?



Not easy. Need exact size scintillator to fit in between support structure.

Cosmic Ray Data Taking with the Barrel

- Scintillator paddle(s) matching with a half of the half-barrel acceptance.
- External Trigger using GTM
- Number of ladder operation may be constrained by the power supply.

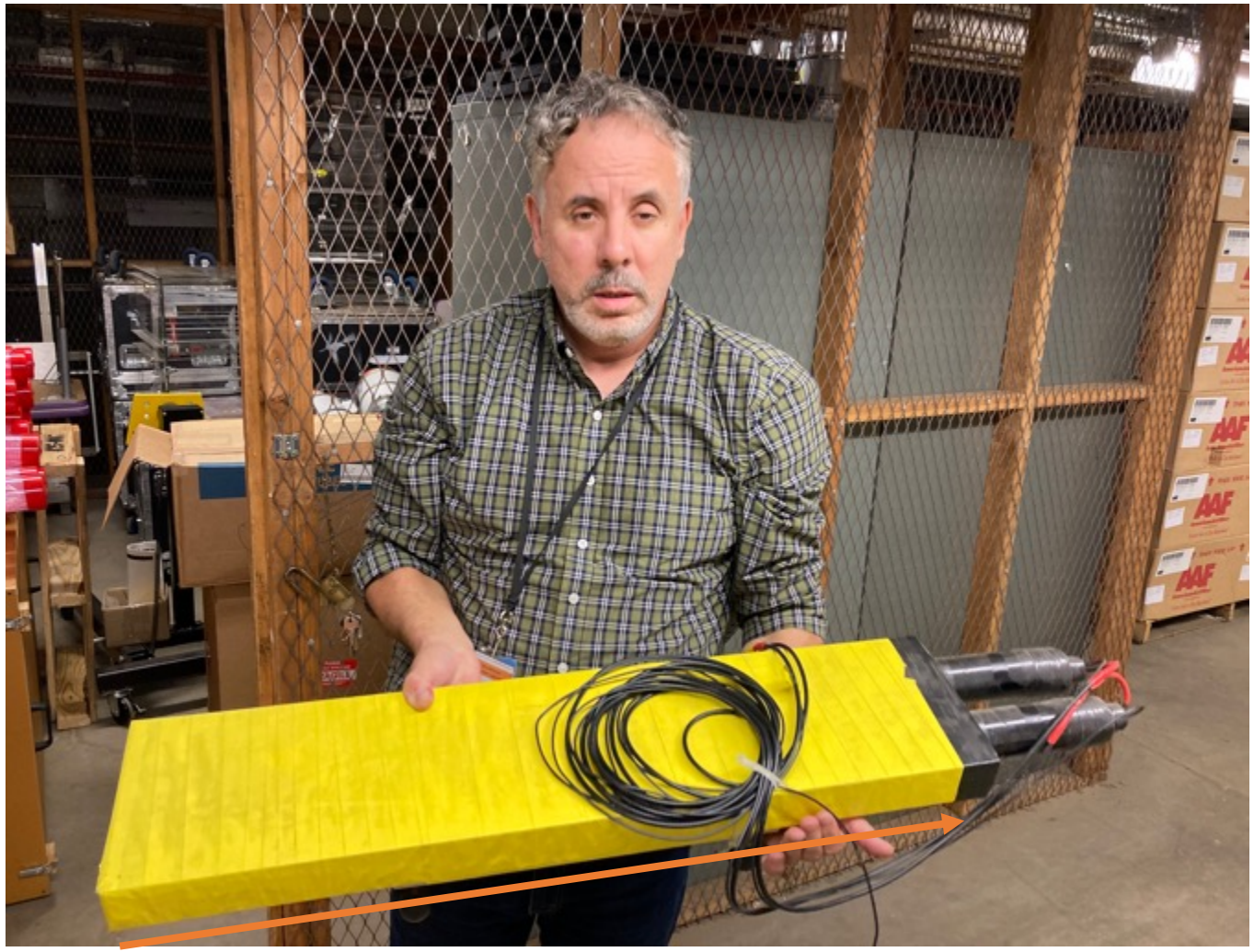


Cosmic Ray Data Taking with the Barrel

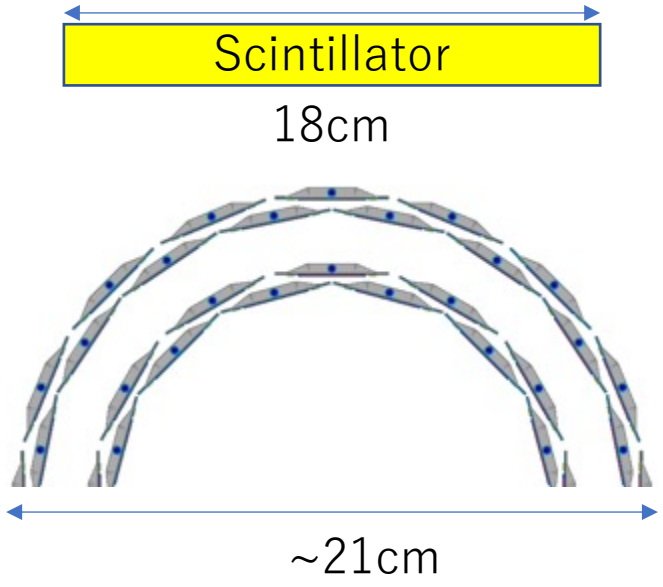
GTM prototype @ Silicon Lab.

Although the GTM module in the Silicon Lab is a prototype, the firm ware is up-to-date to accept the TTL external trigger input (confirmed with Martin).

Trigger Scintillator



- Phobos Scintillator
  81cm x 18cm x 5cm
- Heavy and better not to be mounted on top of the barrel dark box. Need to build a support structure.



Cosmic Ray Data Taking with the Barrel

- First silicon signal observation for the most of production ladders
- Simultaneous operation of multi-ladders (different test from multi-ladder calibration)
- Correlated hits between different layers. Can operate upto 14 half ladders
- Pilot experience of the time-in process prior to the commissioning.
  - Unsuccessful in 2019 Beam test, Successful in 2021 Beam test, but with FEM/FEM-IB based readout system. No experience with Felix.
- Nice testing and fine-tuning ground of online/offline software
  - Online monitor
  - Stability monitor
  - Event display
  - Track Reconstruction Code