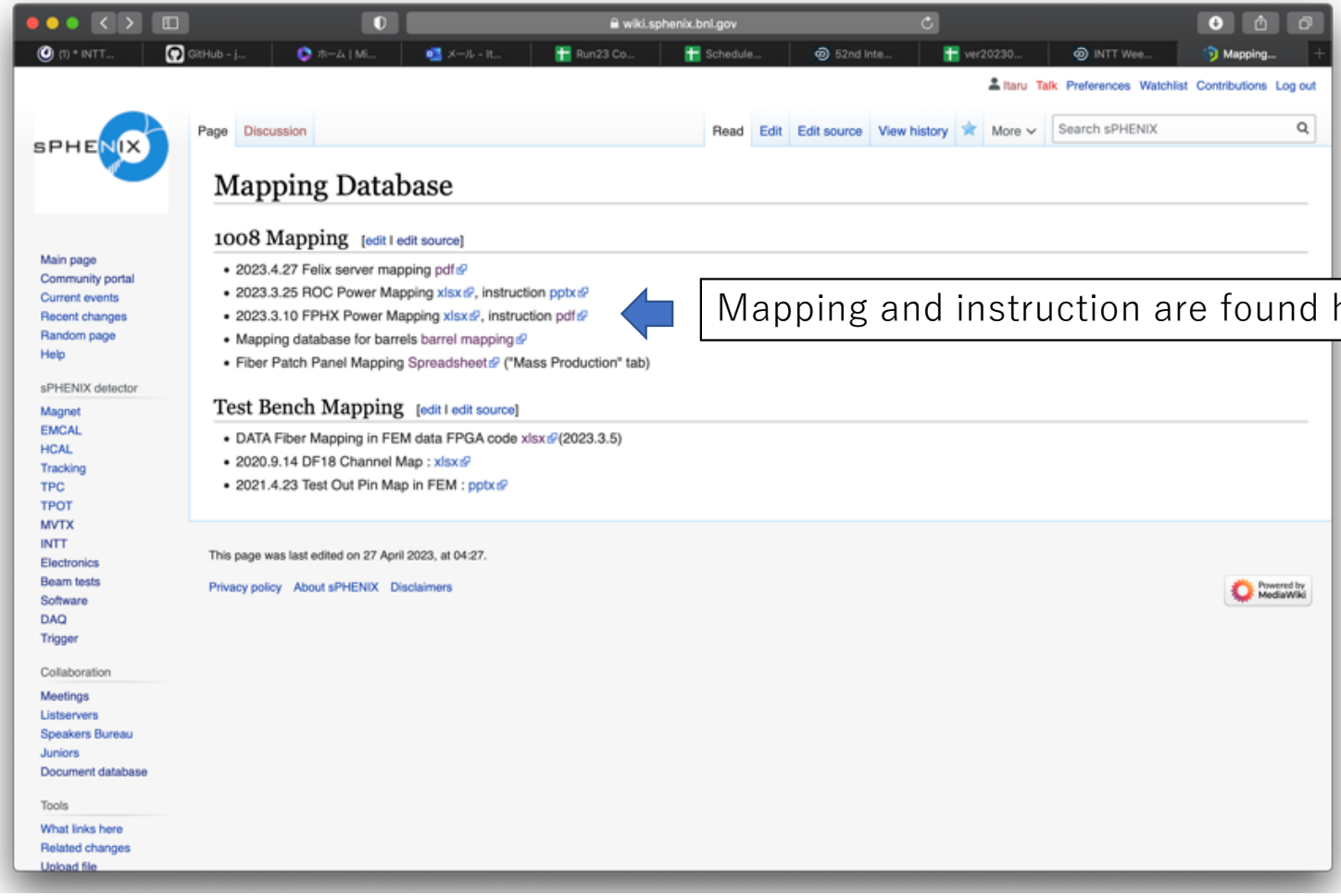
Missing Ladder in intt1

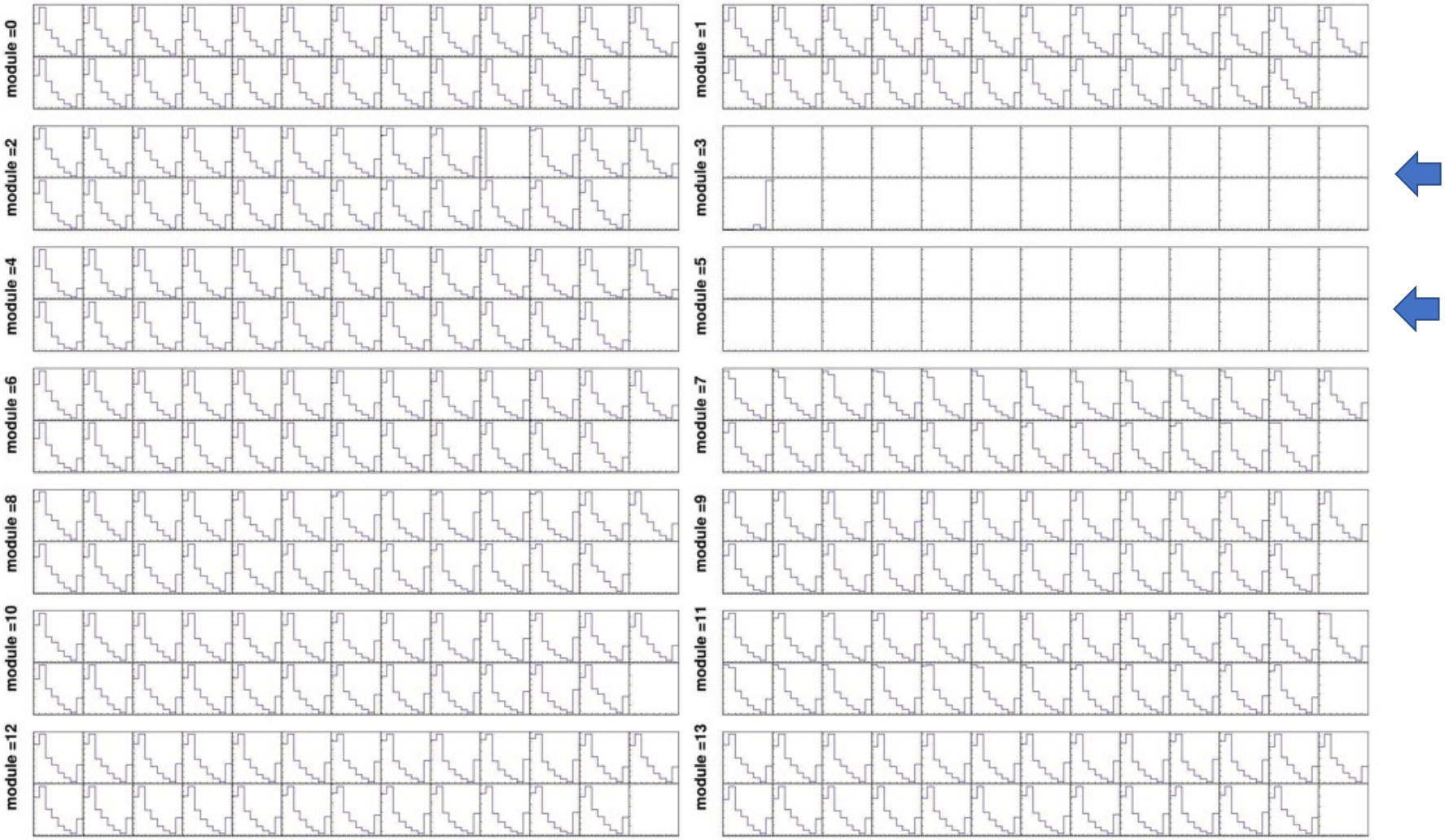
RIKEN/RBRC

Itaru Nakagawa

FPHX Power Debugging

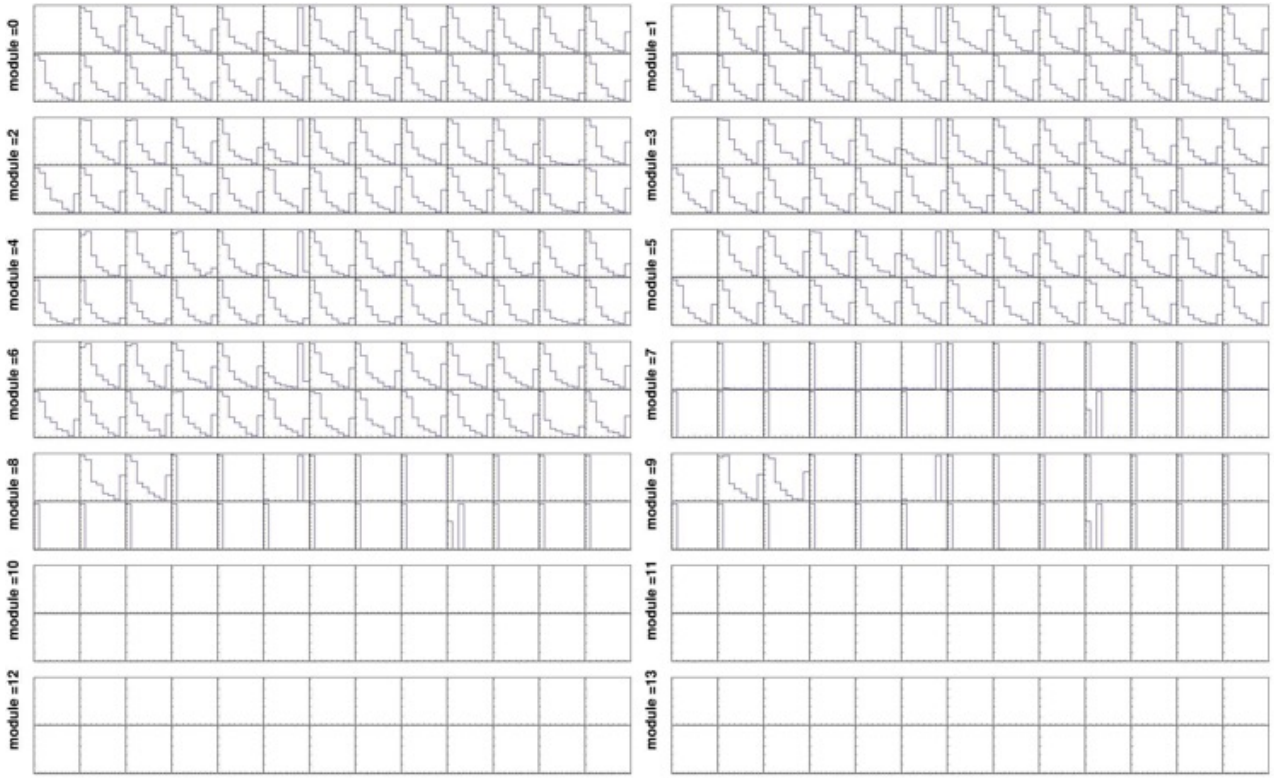


No Signal from 2 Ladders in ROC-2S



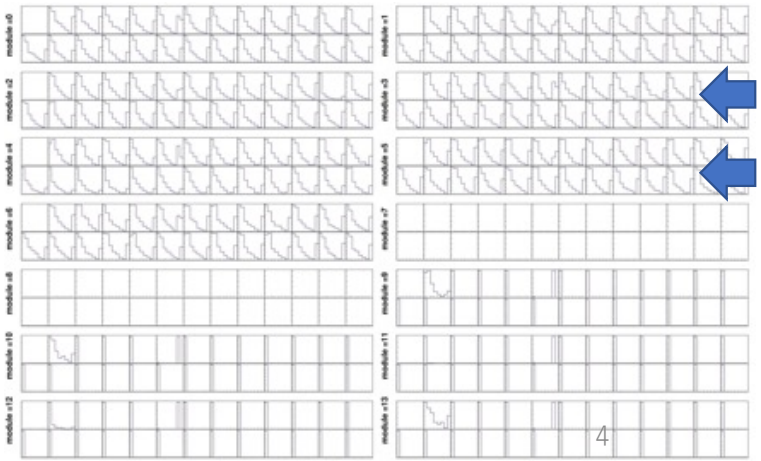
Intt1 commissioning Record in 2023/6/6

beam_intt1-00009418-0000_adc.jpg



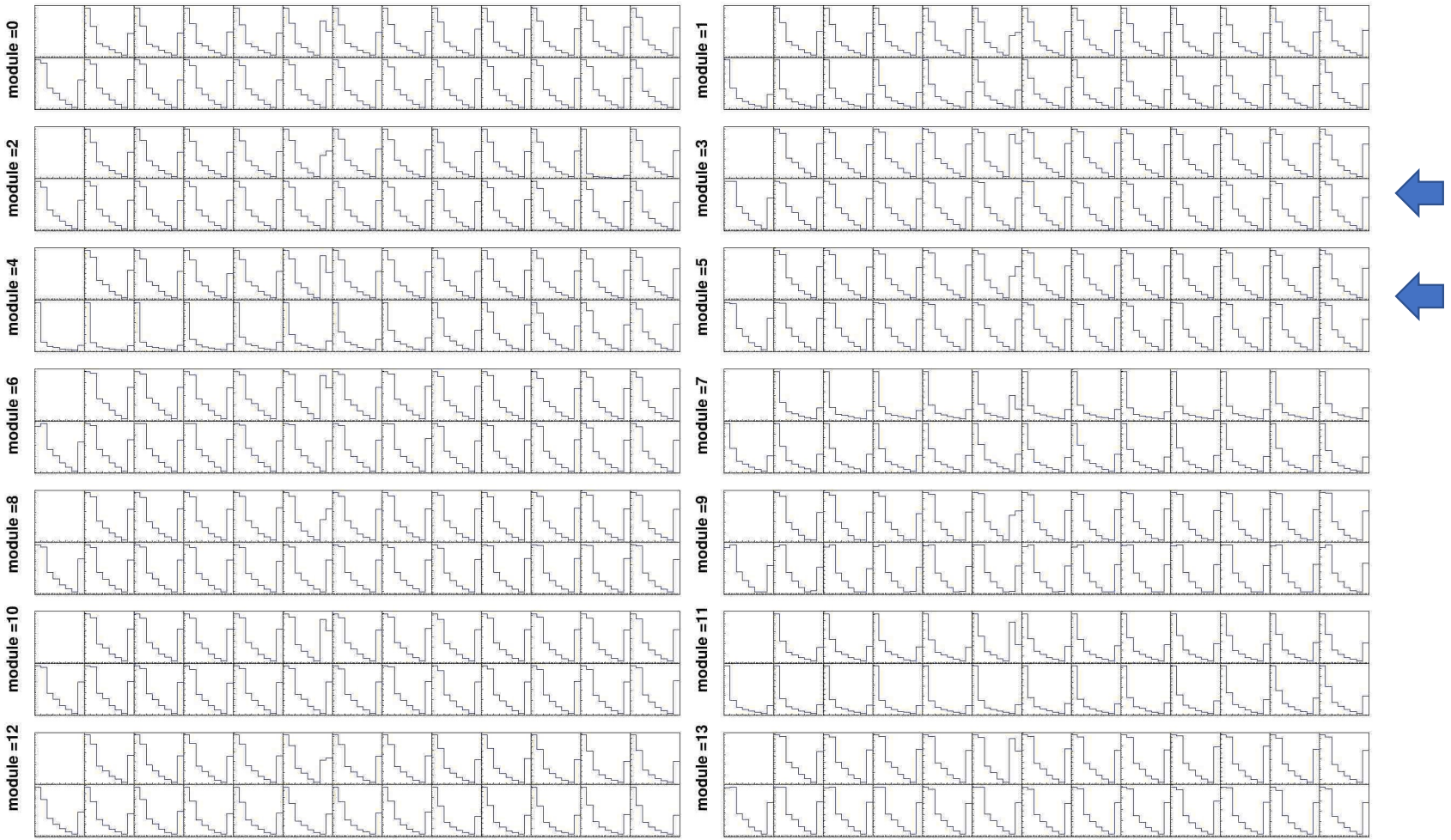
- Module 3 and 5 were certainly alive back then.

beam_intt1-00009424-0000_adc.jpg

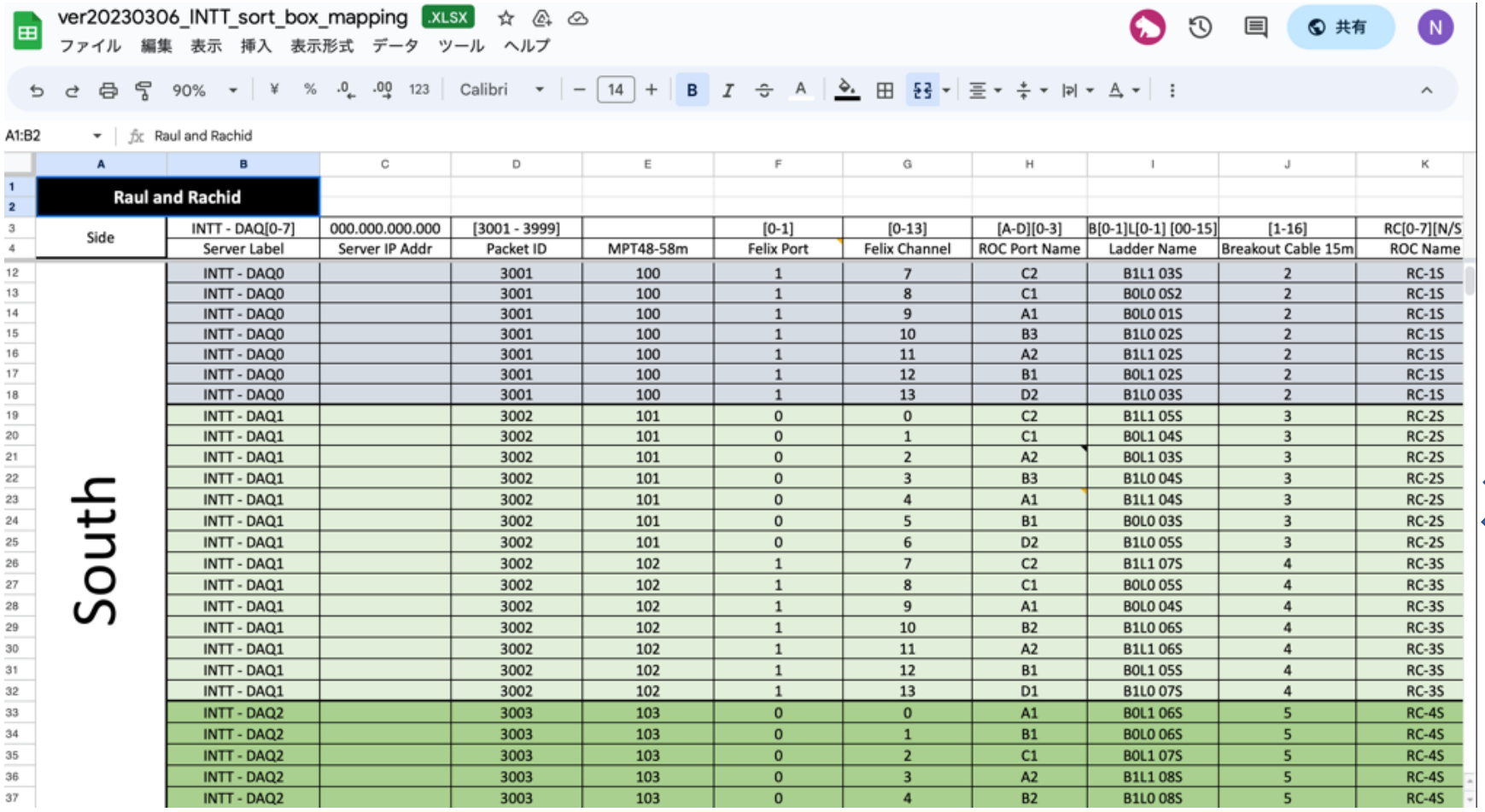


Intt1 operation on 6/11

- Module 3 and 5 were still alive on June 11th.



No Signal from 2 Ladders in ROC-2S



ver20230306_INTT_sort_box_mapping .XLSX

ファイル 編集 表示 挿入 表示形式 データ ツール ヘルプ

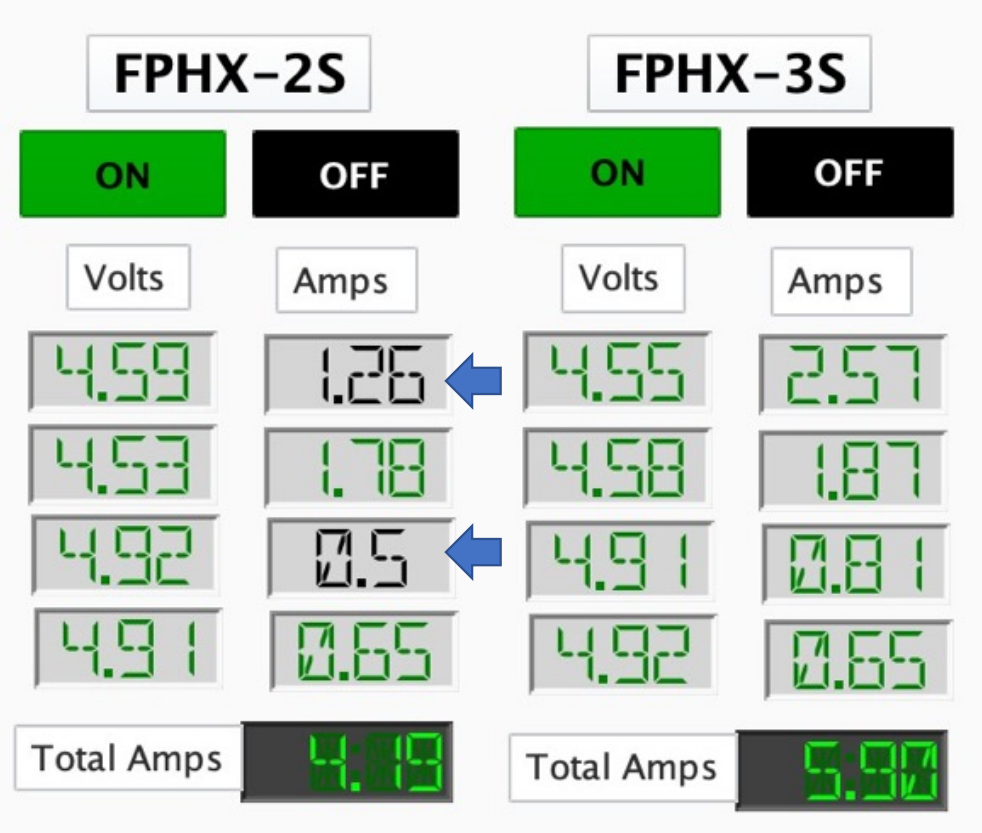
共有

A1:B2 | Raul and Rachid

	A	B	C	D	E	F	G	H	I	J	K
1	Raul and Rachid										
2											
3	Side	INTT - DAQ[0-7]	000.000.000.000	[3001 - 3999]		[0-1]	[0-13]	[A-D][0-3]	B[0-1]L[0-1] [00-15]	[1-16]	RC[0-7][N/S
4		Server Label	Server IP Addr	Packet ID	MPT48-58m	Felix Port	Felix Channel	ROC Port Name	Ladder Name	Breakout Cable 15m	ROC Name
12	South	INTT - DAQ0		3001	100	1	7	C2	B1L1 03S	2	RC-1S
13		INTT - DAQ0		3001	100	1	8	C1	B0L0 0S2	2	RC-1S
14		INTT - DAQ0		3001	100	1	9	A1	B0L0 01S	2	RC-1S
15		INTT - DAQ0		3001	100	1	10	B3	B1L0 02S	2	RC-1S
16		INTT - DAQ0		3001	100	1	11	A2	B1L1 02S	2	RC-1S
17		INTT - DAQ0		3001	100	1	12	B1	B0L1 02S	2	RC-1S
18		INTT - DAQ0		3001	100	1	13	D2	B1L0 03S	2	RC-1S
19		INTT - DAQ1		3002	101	0	0	C2	B1L1 05S	3	RC-2S
20		INTT - DAQ1		3002	101	0	1	C1	B0L1 04S	3	RC-2S
21		INTT - DAQ1		3002	101	0	2	A2	B0L1 03S	3	RC-2S
22		INTT - DAQ1		3002	101	0	3	B3	B1L0 04S	3	RC-2S
23		INTT - DAQ1		3002	101	0	4	A1	B1L1 04S	3	RC-2S
24		INTT - DAQ1		3002	101	0	5	B1	B0L0 03S	3	RC-2S
25		INTT - DAQ1		3002	101	0	6	D2	B1L0 05S	3	RC-2S
26		INTT - DAQ1		3002	102	1	7	C2	B1L1 07S	4	RC-3S
27		INTT - DAQ1		3002	102	1	8	C1	B0L0 05S	4	RC-3S
28		INTT - DAQ1		3002	102	1	9	A1	B0L0 04S	4	RC-3S
29		INTT - DAQ1		3002	102	1	10	B2	B1L0 06S	4	RC-3S
30		INTT - DAQ1		3002	102	1	11	A2	B1L1 06S	4	RC-3S
31		INTT - DAQ1		3002	102	1	12	B1	B0L1 05S	4	RC-3S
32		INTT - DAQ1		3002	102	1	13	D1	B1L0 07S	4	RC-3S
33		INTT - DAQ2		3003	103	0	0	A1	B0L1 06S	5	RC-4S
34		INTT - DAQ2		3003	103	0	1	B1	B0L0 06S	5	RC-4S
35		INTT - DAQ2		3003	103	0	2	C1	B0L1 07S	5	RC-4S
36		INTT - DAQ2		3003	103	0	3	A2	B1L1 08S	5	RC-4S
37		INTT - DAQ2		3003	103	0	4	B2	B1L0 08S	5	RC-4S

https://docs.google.com/spreadsheets/d/19PSvkhAQA8rnkP0z_wpN87CWQ6O-f3bT/edit#gid=1658598300

The current draw for these ladders



- The drawing currents were less for these ladders which Imply that FPHXs were not powered for these channels.
- Should check the history of drawing currents for theses channels in ignition when this symptom started.

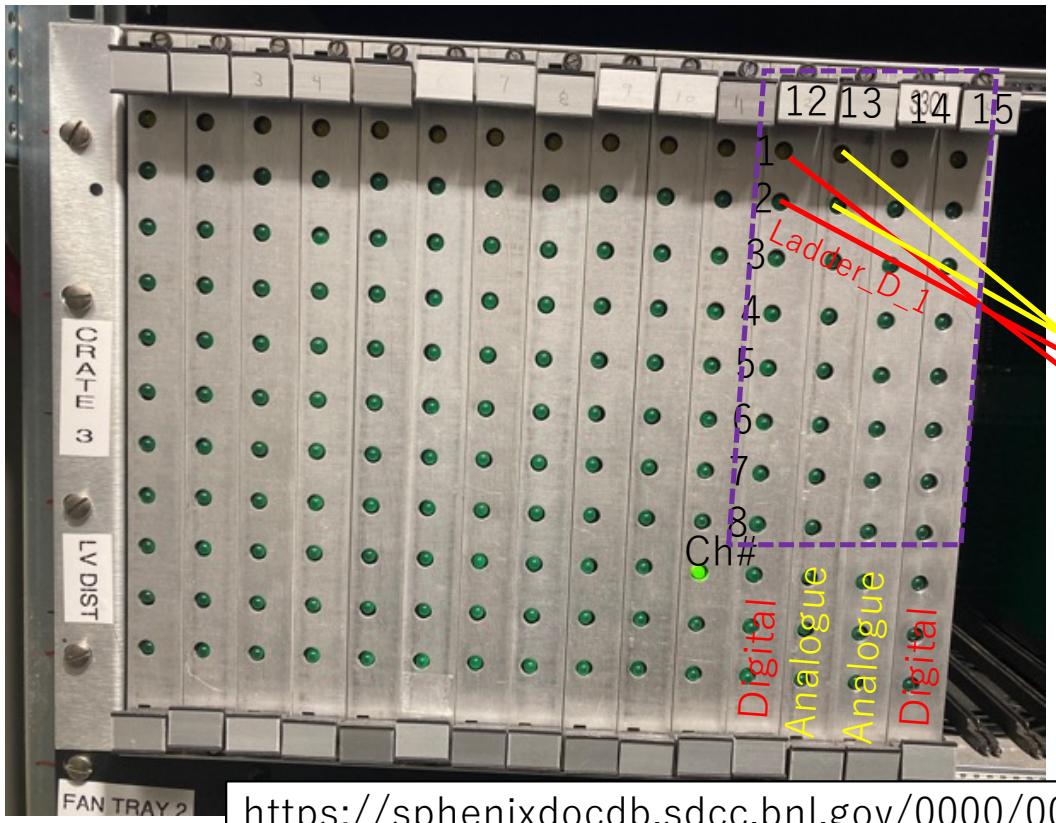
History chart instruction by Cheng-Wei:
https://indico.bnl.gov/event/19147/contributions/75551/attachments/47046/79796/INTT_2023_04_13_ignition.pdf

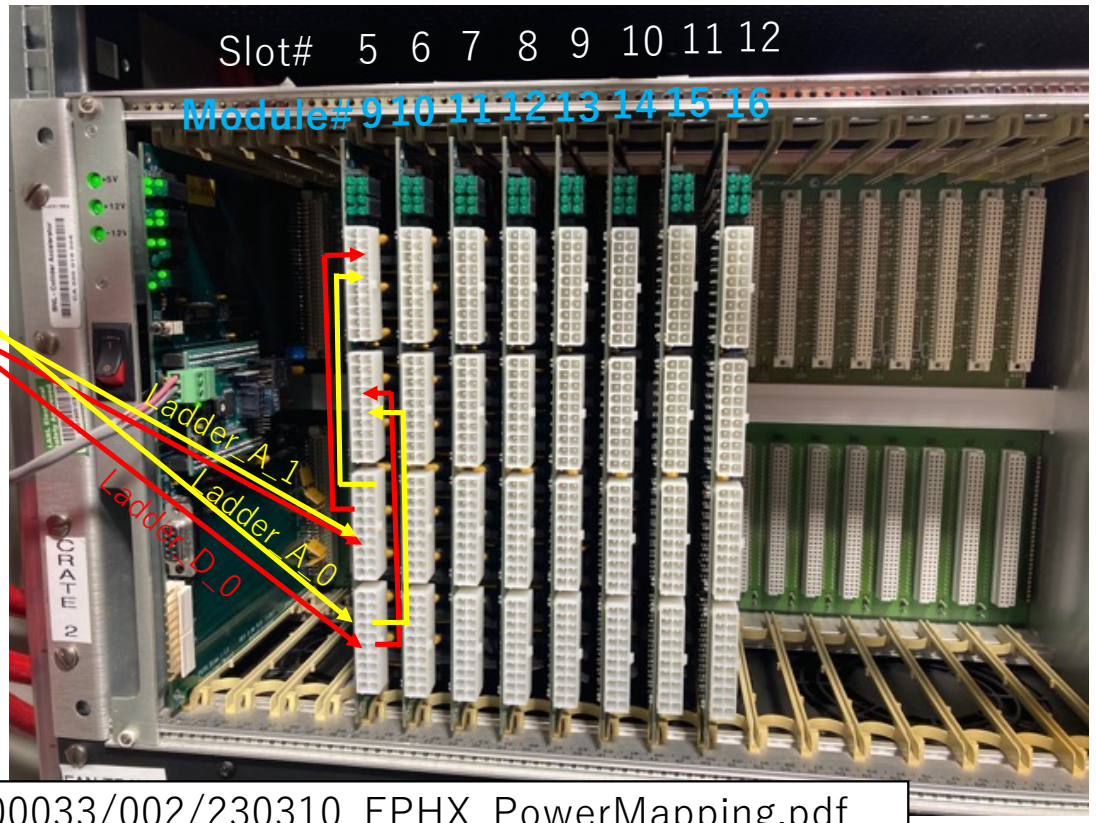
- It can be multiple causes like the ladders themselves, bad FPHX power cable contacts, etc, but I would start checking from the filter board.

Distribution Modules – Filtering Boards Mapping

Distribution Module

Filtering Boards

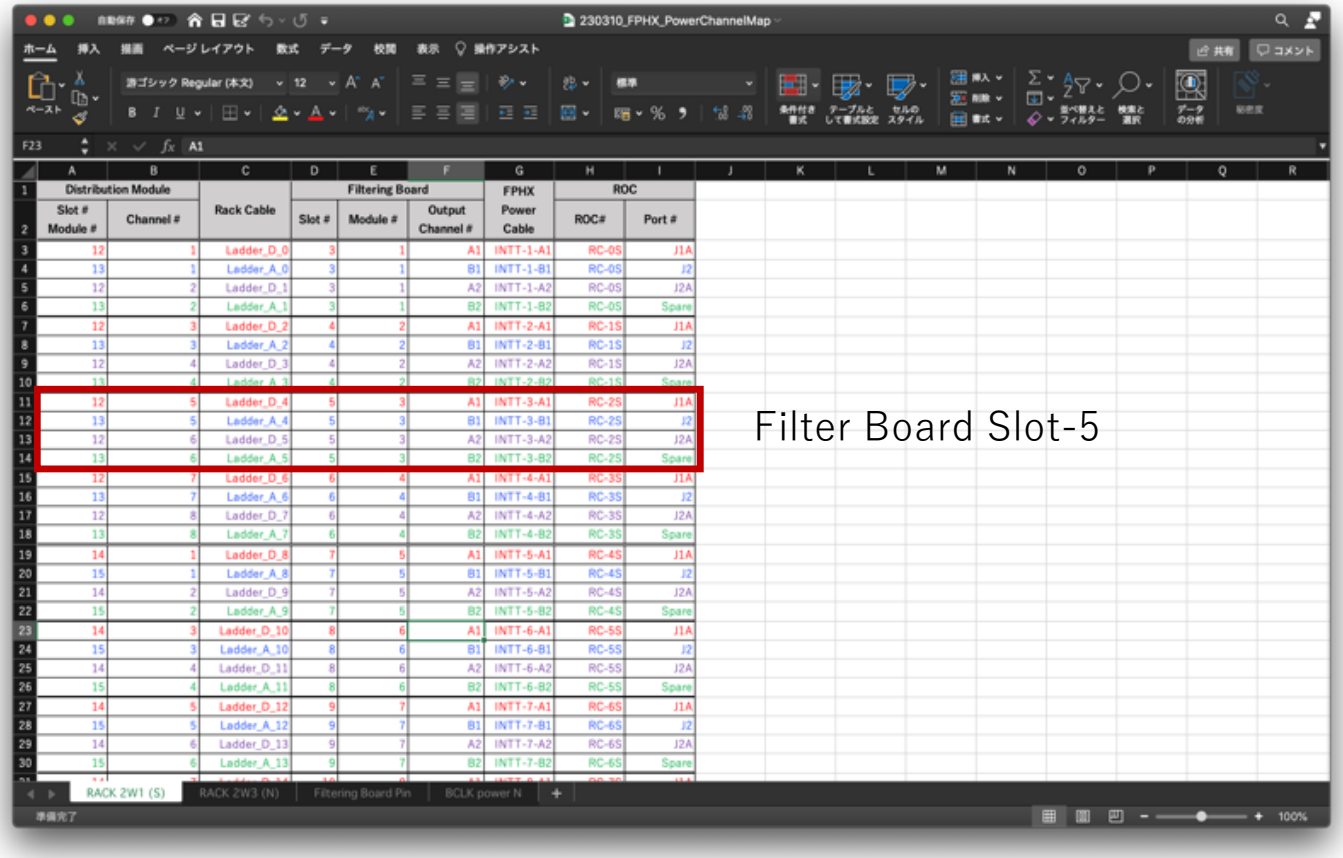




https://sphenixdocdb.sdcc.bnl.gov/0000/000033/002/230310_FPHX_PowerMapping.pdf

North

Filter Board for ROC-2S

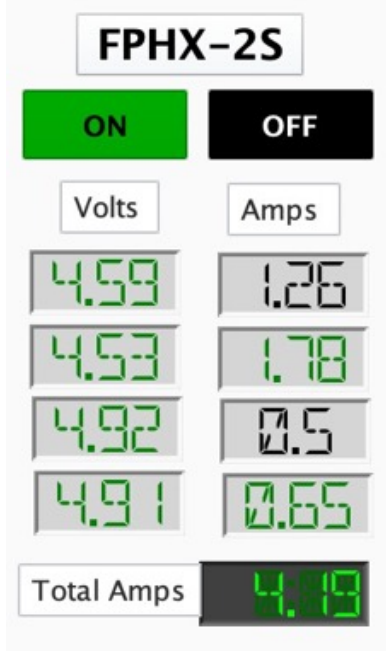


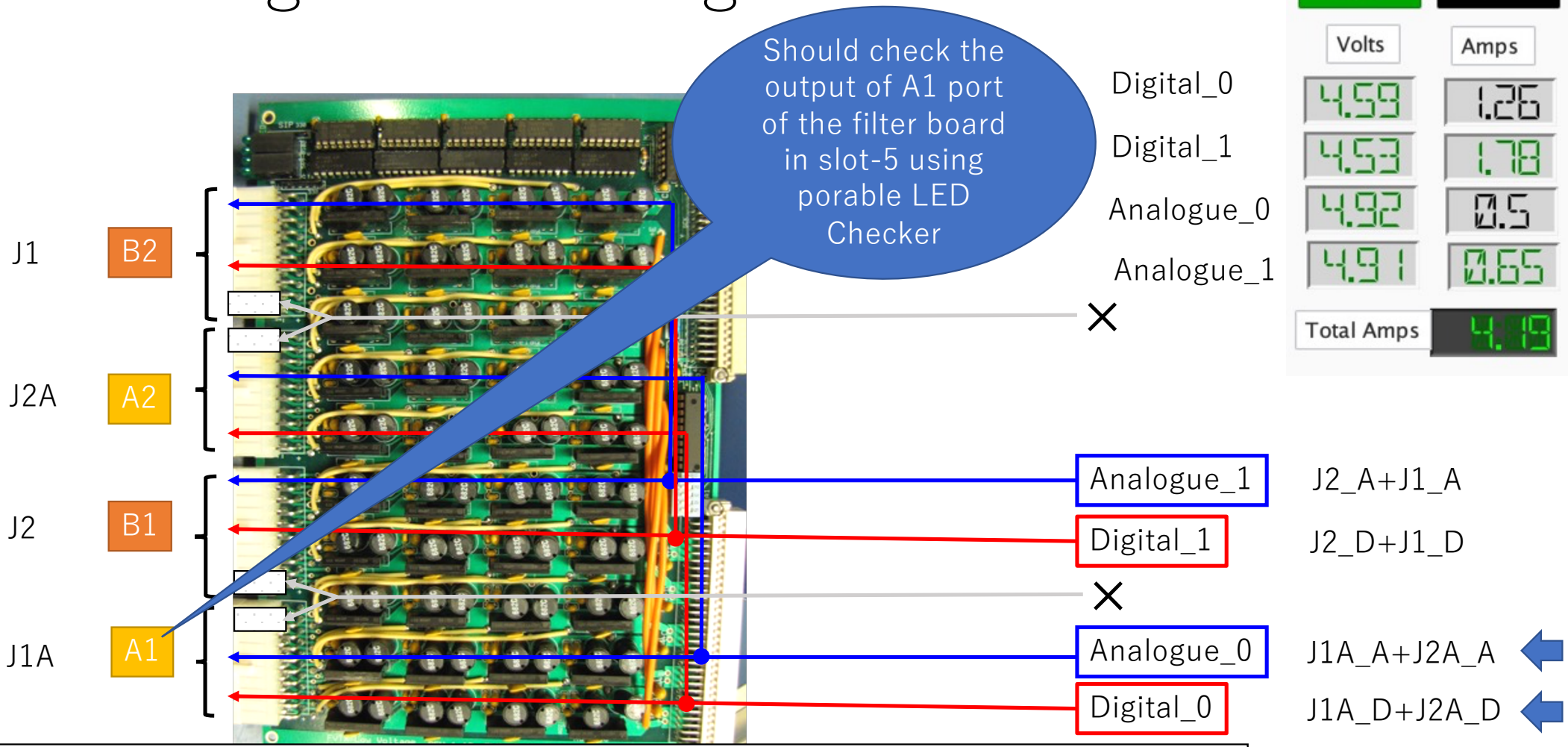
Distribution Module			Filtering Board			FPHX	ROC	
Slot # Module #	Channel #	Rack Cable	Slot #	Module #	Output Channel #	Power Cable	ROC#	Port #
12	1	Ladder_D_0	3	1	A1	INTT-1-A1	RC-0S	J1A
13	1	Ladder_A_0	3	1	B1	INTT-1-B1	RC-0S	J2
12	2	Ladder_D_1	3	1	A2	INTT-1-A2	RC-0S	J2A
13	2	Ladder_A_1	3	1	B2	INTT-1-B2	RC-0S	Spare
12	3	Ladder_D_2	4	2	A1	INTT-2-A1	RC-1S	J1A
13	3	Ladder_A_2	4	2	B1	INTT-2-B1	RC-1S	J2
12	4	Ladder_D_3	4	2	A2	INTT-2-A2	RC-1S	J2A
13	4	Ladder_A_3	4	2	B2	INTT-2-B2	RC-1S	Spare
12	5	Ladder_D_4	5	3	A1	INTT-3-A1	RC-2S	J1A
13	5	Ladder_A_4	5	3	B1	INTT-3-B1	RC-2S	J2
12	6	Ladder_D_5	5	3	A2	INTT-3-A2	RC-2S	J2A
13	6	Ladder_A_5	5	3	B2	INTT-3-B2	RC-2S	Spare
12	7	Ladder_D_6	6	4	A1	INTT-4-A1	RC-3S	J1A
13	7	Ladder_A_6	6	4	B1	INTT-4-B1	RC-3S	J2
12	8	Ladder_D_7	6	4	A2	INTT-4-A2	RC-3S	J2A
13	8	Ladder_A_7	6	4	B2	INTT-4-B2	RC-3S	Spare
14	1	Ladder_D_8	7	5	A1	INTT-5-A1	RC-4S	J1A
15	1	Ladder_A_8	7	5	B1	INTT-5-B1	RC-4S	J2
14	2	Ladder_D_9	7	5	A2	INTT-5-A2	RC-4S	J2A
15	2	Ladder_A_9	7	5	B2	INTT-5-B2	RC-4S	Spare
14	3	Ladder_D_10	8	6	A1	INTT-6-A1	RC-5S	J1A
15	3	Ladder_A_10	8	6	B1	INTT-6-B1	RC-5S	J2
14	4	Ladder_D_11	8	6	A2	INTT-6-A2	RC-5S	J2A
15	4	Ladder_A_11	8	6	B2	INTT-6-B2	RC-5S	Spare
14	5	Ladder_D_12	9	7	A1	INTT-7-A1	RC-6S	J1A
15	5	Ladder_A_12	9	7	B1	INTT-7-B1	RC-6S	J2
14	6	Ladder_D_13	9	7	A2	INTT-7-A2	RC-6S	J2A
15	6	Ladder_A_13	9	7	B2	INTT-7-B2	RC-6S	Spare

Filter Board Slot-5

https://wiki.sphenix.bnl.gov/index.php/Mapping_Database

Filtering Board Configuration

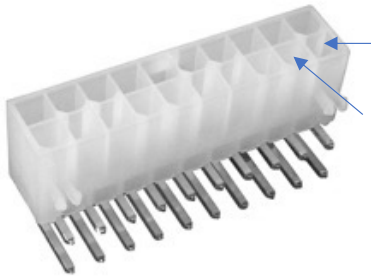


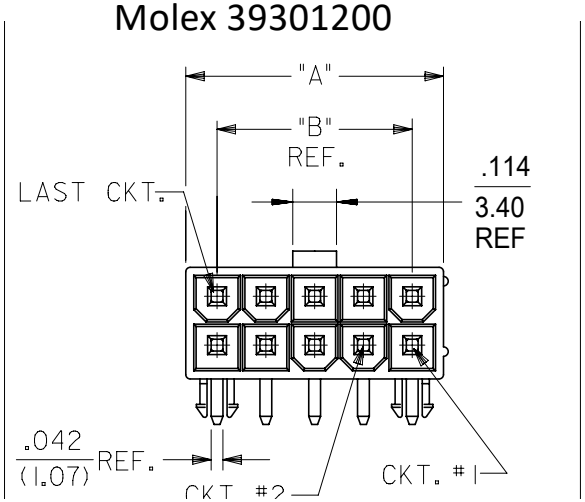


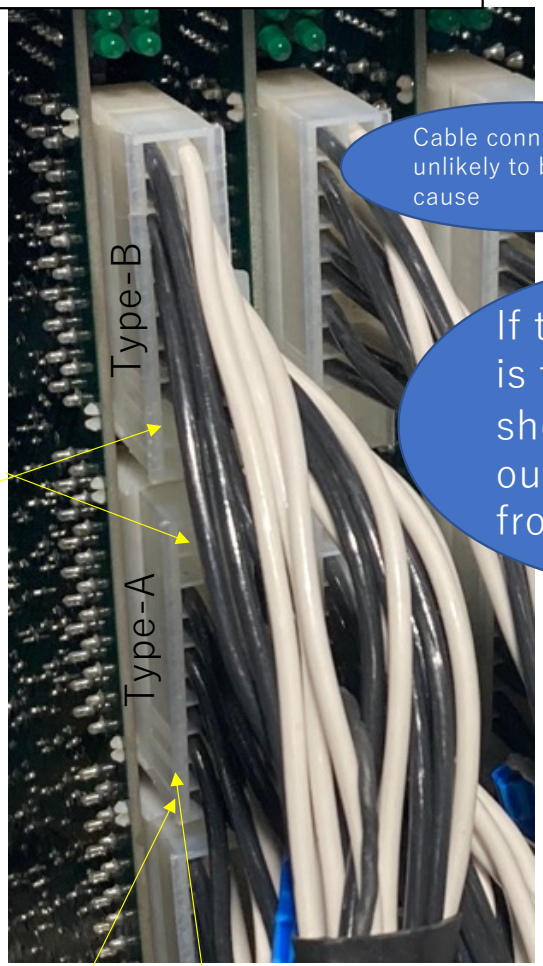
https://sphenixdocdb.sdcc.bnl.gov/0000/000033/002/230310_FPHX_PowerMapping.pdf

Filter Board Connector Mapping

https://sphenixdocdb.sdcc.bnl.gov/0000/000033/002/230310_FPHX_PowerMapping.pdf







Cable connection is unlikely to be the cause

If the filter board is the cause, you should see no output voltage from Ch#2 and #6.

	Filter Board		ROC	
Type-B	10	20	Column-D	Analogue
	9	19	Column-C	Analogue
	8	18	Column-B	Analogue
	7	17	Column-A	Analogue
	6	16	Column-D	Digital
	5	15	Column-C	Digital
	4	14	Column-B	Digital
	3	13	Column-A	Digital
	2	12	Not in use	

		oard Ch#	DF	
	1	10	Not in use	
Type-A	8	18	Column-D	Analogue
	7	17	Column-C	Analogue
	6	16	Column-B	Analogue
	5	15	Column-A	Analogue
	4	14	Column-D	Digital
	3	13	Column-C	Digital
	2	12	Column-B	Digital
	1	11	Column-A	Digital

FPHX Power Cable Channel Map

Type-A

Filter Board		DF11-Pin	DF11-Pin	DF18	
10	20				
8	18	GND	8	Column-D	Analogue
7	17	GND	6	Column-C	Analogue
6	16	GND	4	Column-B	Analogue
5	15	GND	2	Column-A	Analogue
4	14	GND	7	Column-D	Digital
3	13	GND	5	Column-C	Digital
2	12	GND	3	Column-B	Digital
1	11	GND	1	Column-A	Digital

Based on actual measurement on 5/1

https://sphenixdocdb.sdcc.bnl.gov/0000/000033/002/230310_FPHX_PowerMapping.pdf