

FSTAR-Collaboration Meeting February 2022 Hardware

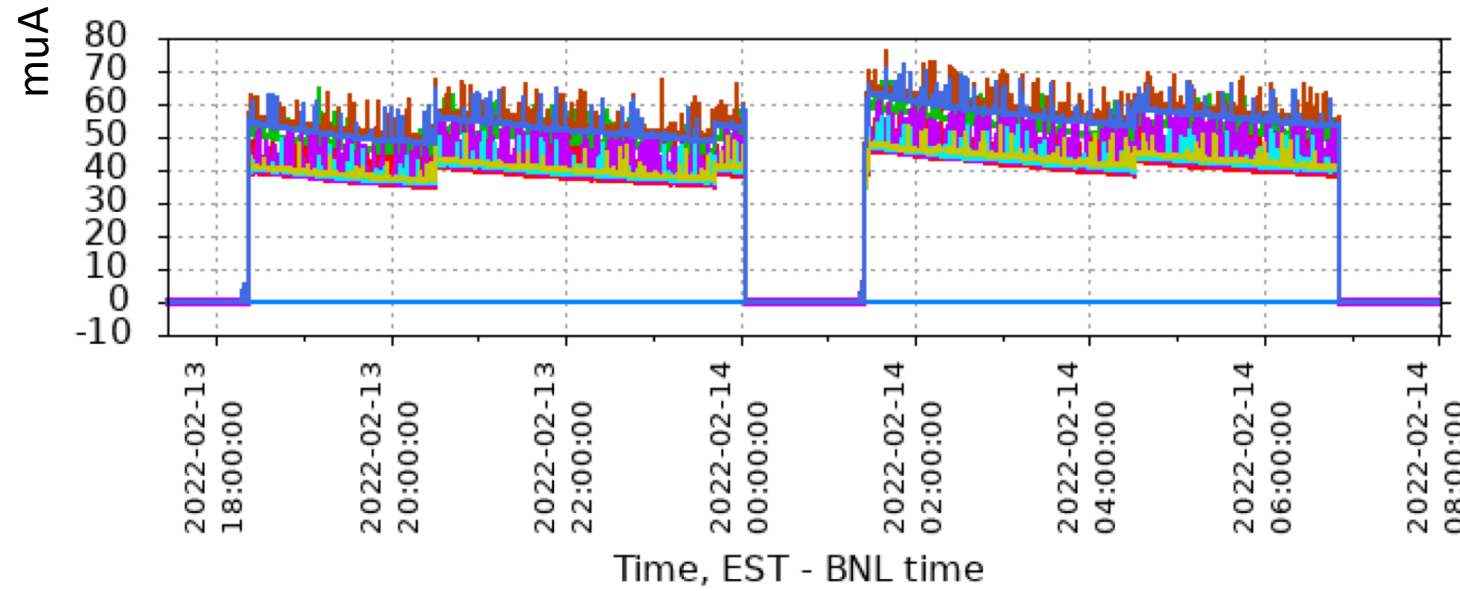
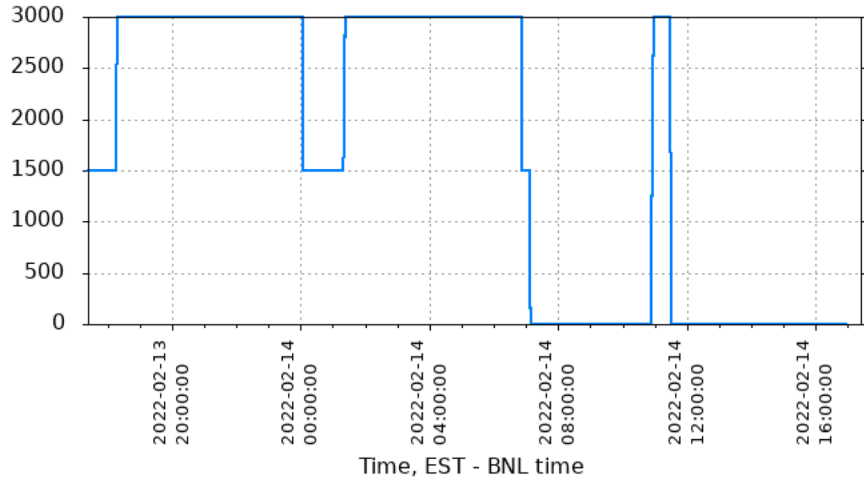
sTGC Status

S. Prashanth for the sTGC Group

Operational parameters of the detector

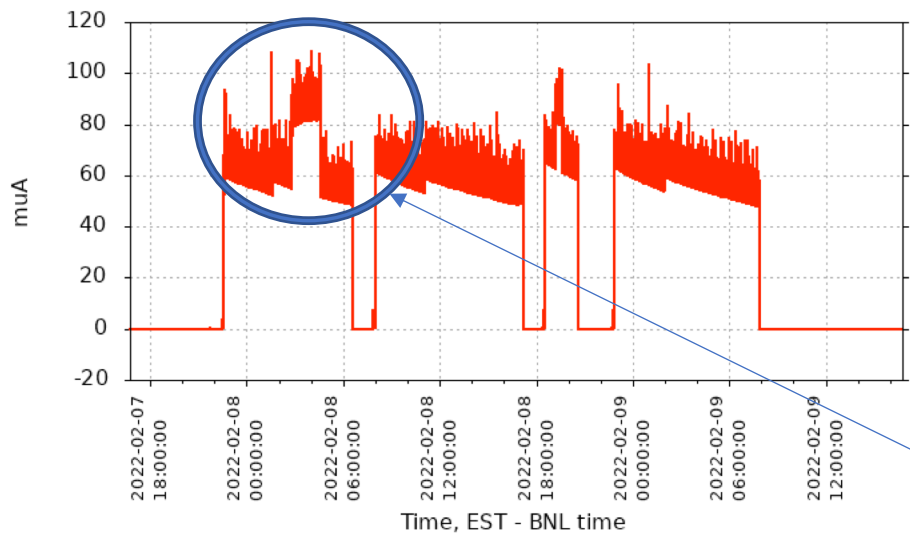
- Physics
 - HV: 3000 V
 - LV: turn ON
- Apex, beam studies, injection, and beam dump
 - HV: 1500 V
 - LV: turn OFF
- Gas system
 - Refill pentane every three weeks(depends)
 - Alarms when time to change
 - New CO2 cylinder every three months(depends)
 - Backup cylinder kick in if primary cylinder goes empty
- Issues
 - Not much HV trips observed on good channels
 - FOBs need to be power cycled if missing from the shift-crew QA plots
 - Gas parameters needs to be adjusted if out of range
 - LV loss of communication
 - HV loss of communication

HV



sTGC:HV:0:0:vmon ———
 sTGC:HV:1:0:vmon ———
 sTGC:HV:2:0:vmon ———

sTGC:HV:0:0:imon, muA ———
 sTGC:HV:0:1:imon, muA ———
 sTGC:HV:0:8:imon, muA ———
 sTGC:HV:0:9:imon, muA ———
 sTGC:HV:1:4:imon, muA ———
 sTGC:HV:1:5:imon, muA ———
 sTGC:HV:2:0:imon, muA ———
 sTGC:HV:2:1:imon, muA ———



sTGC:HV:2:2:imon, muA ———

- Trip limit is 340 muA
- Up to 350 muA is high resolution mode

Only this channel, why?

LV and DAQ

- Issues on connecting to Raspberry Pi on the LV power supply



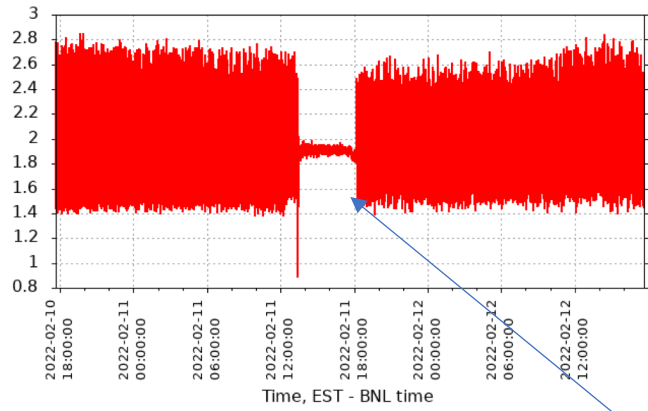
sTGC Chambers				DAQ & LV					
Plane	Station #	Quarderent	ROB#	FOB#					
				1	2	3	4	5	6
1	18	A	1	1	2	3	4	5	6
	28	B	2	7	8	9	10	11	12
	22	C	3	13	14	15	16	17	18
	21	D	4	19	20	21	22	23	24
2	27	A	5	25	26	27	28	29	30
	26	B	6	31	32	33	34	35	36
	20	C	7	37	38	39	40	41	42
	25	D	8	43	44	45	46	47	48
3	33	A	9	49	50	51	52	53	54
	29	B	10	55	56	57	58	59	60
	34	C	11	61	62	63	64	65	66
	35	D	12	67	68	69	70	71	72
4	30	A	13	73	74	75	76	77	78
	31	B	14	79	80	81	82	83	84
	23	C	15	85	86	87	88	89	90
	19	D	16	91	92	93	94	95	96

Simplified mapping for shift-crew

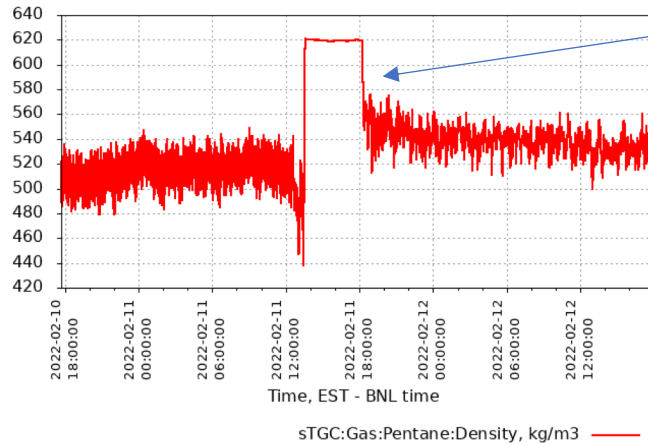
Cooling System

- Air cooling for the FEB
- Set to 72⁰ F
 - Blower can "only" operate between 70-72⁰ F
- Had issues with breaker for the compressor
 - Replaced it about a month ago
 - Looks good now, but at some point it need to be replaced again to avoid continues failing
- Have monitors/alarms for temperature, compressor

Gas System

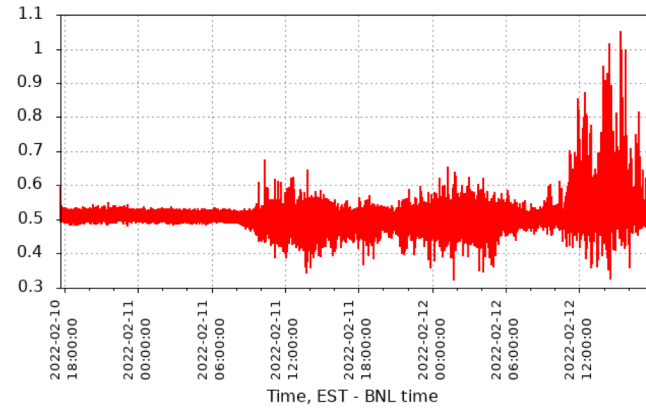


Input pressure

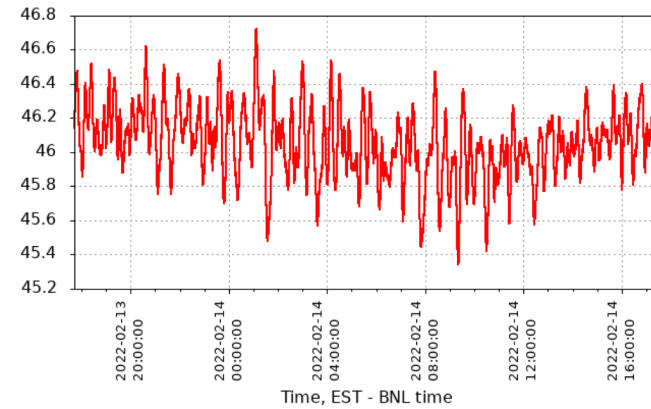


Pentane density in the mass flow meter

When new pentane is introduced, no carbonation yet

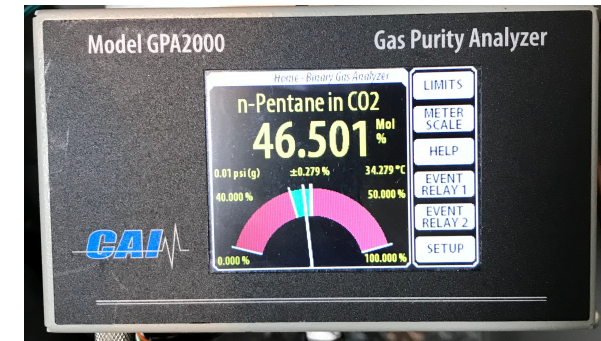


Vent pressure



Pentane % in mixed gas

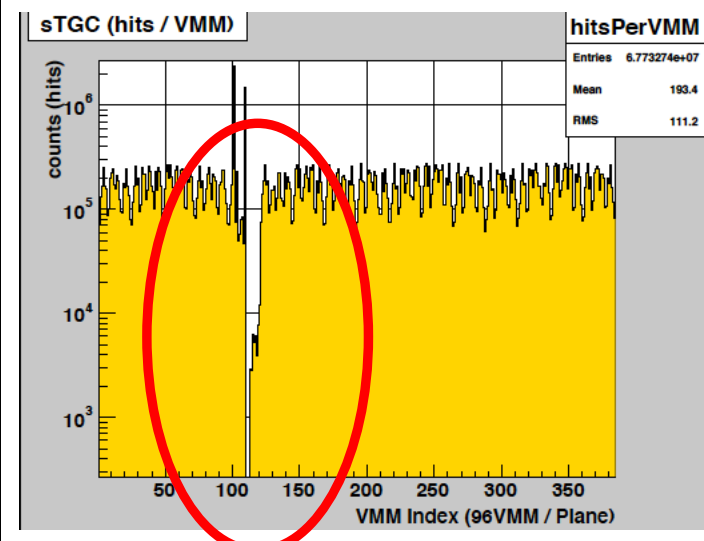
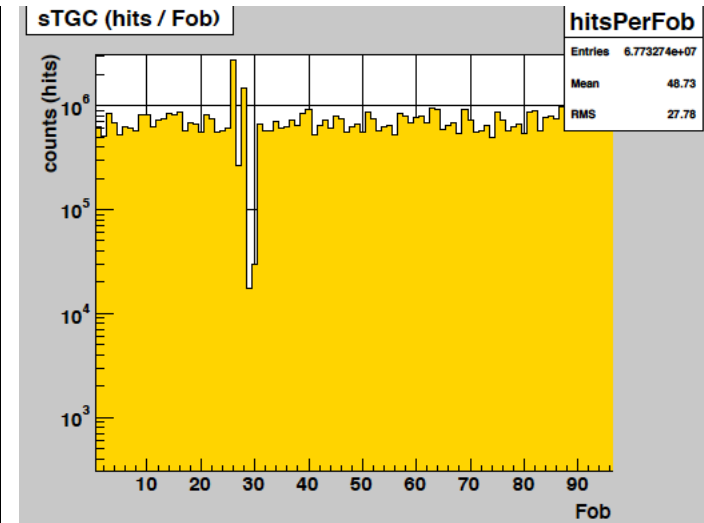
CO2 flow rate 130 cc/min
Pentane flow rate ~21.5 g/hr



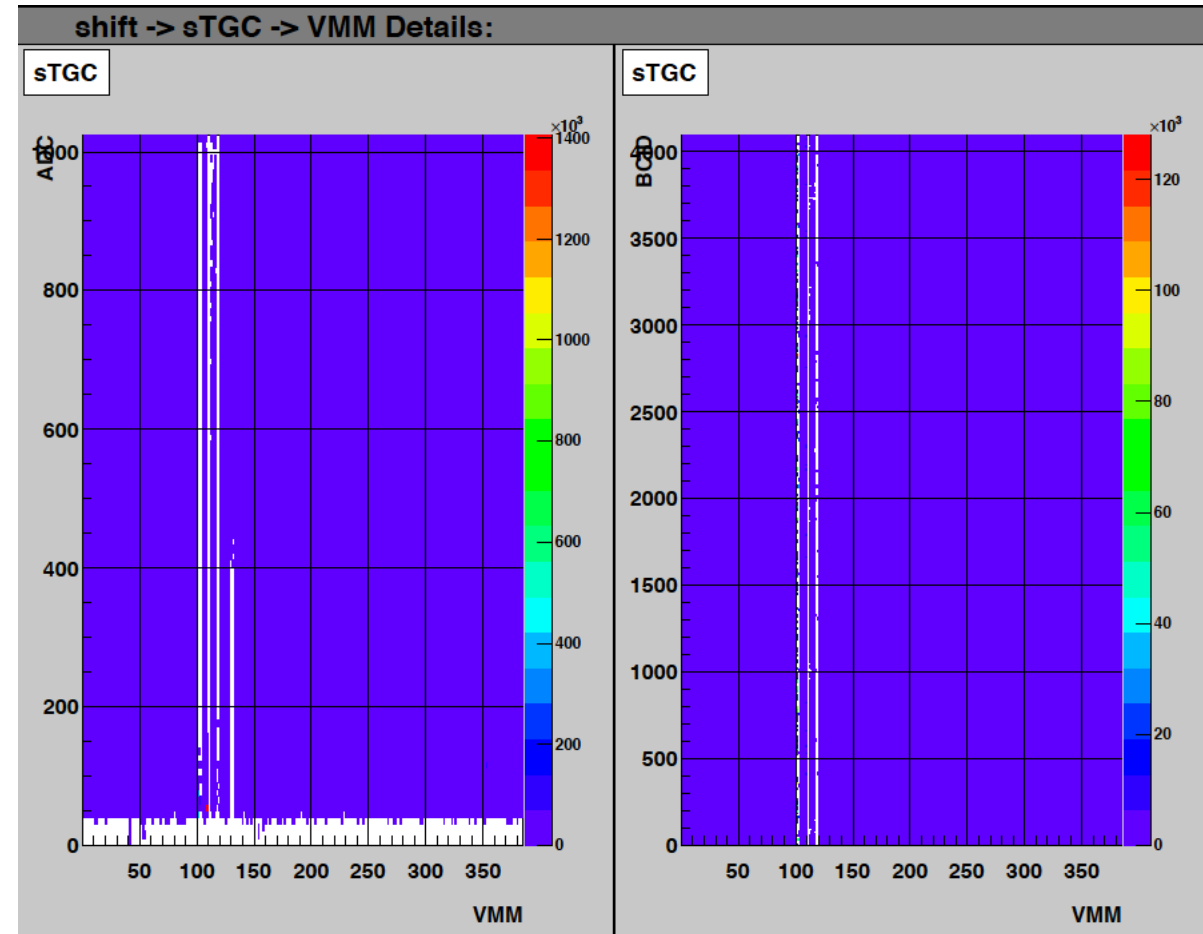
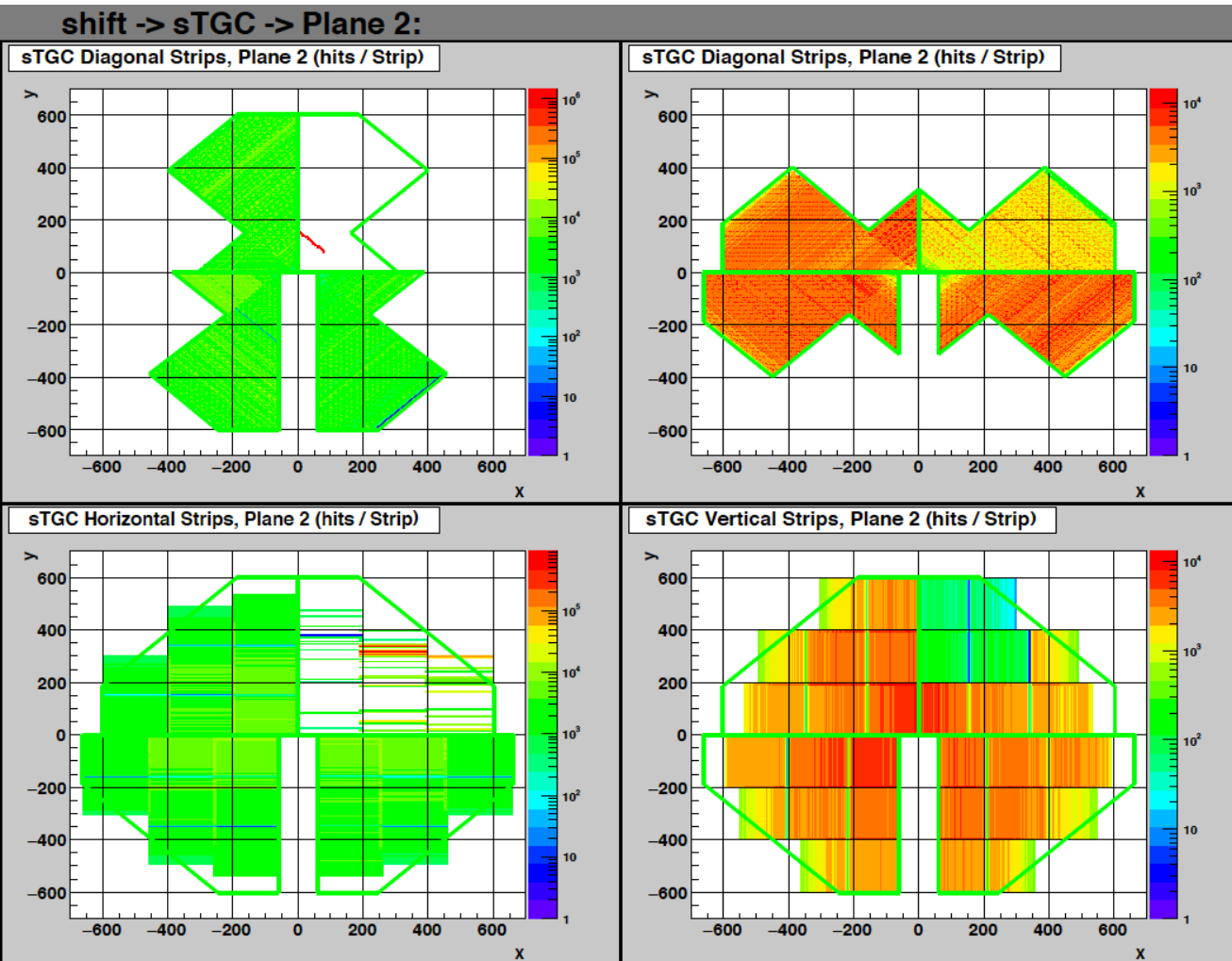
Online plots

Cable 9

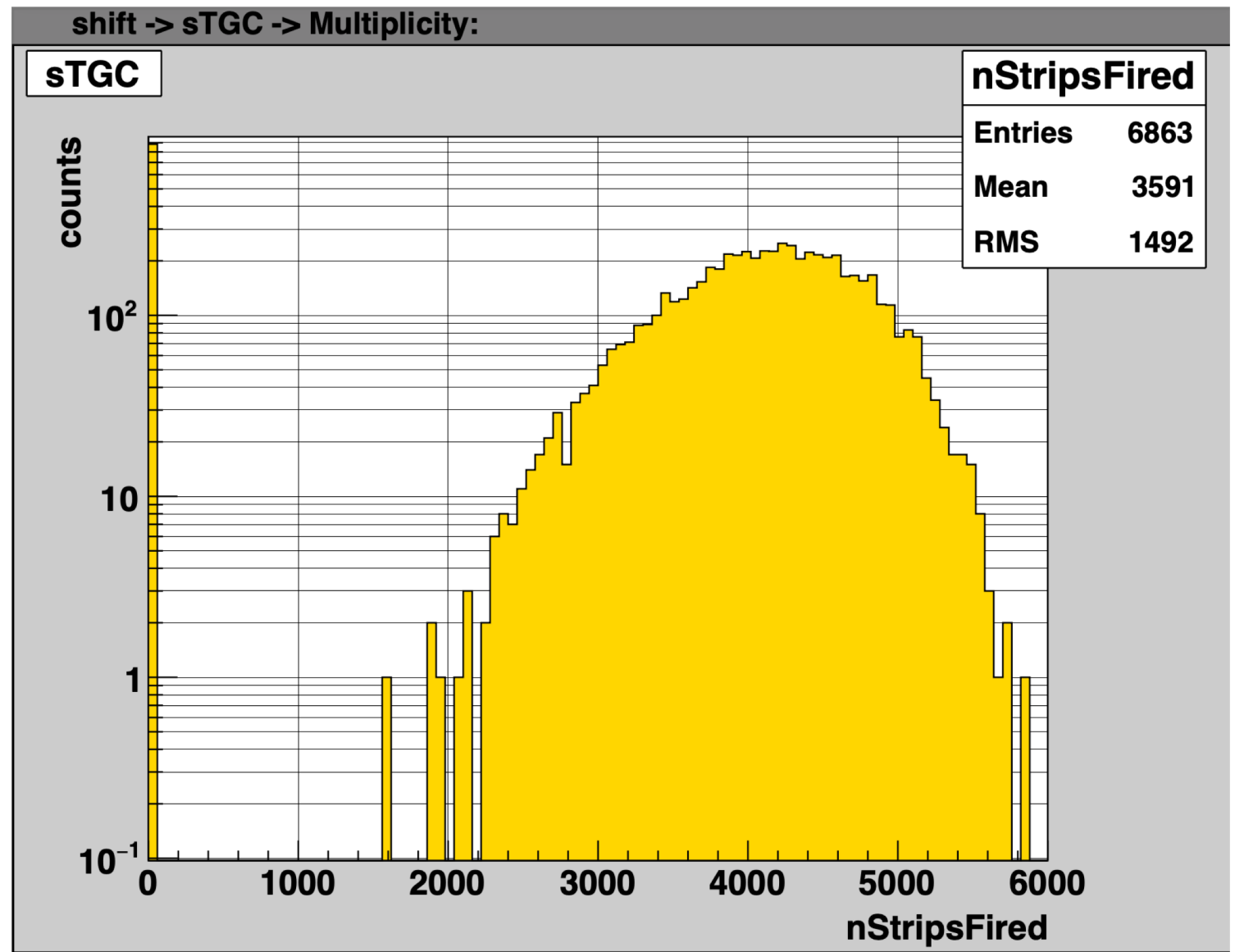
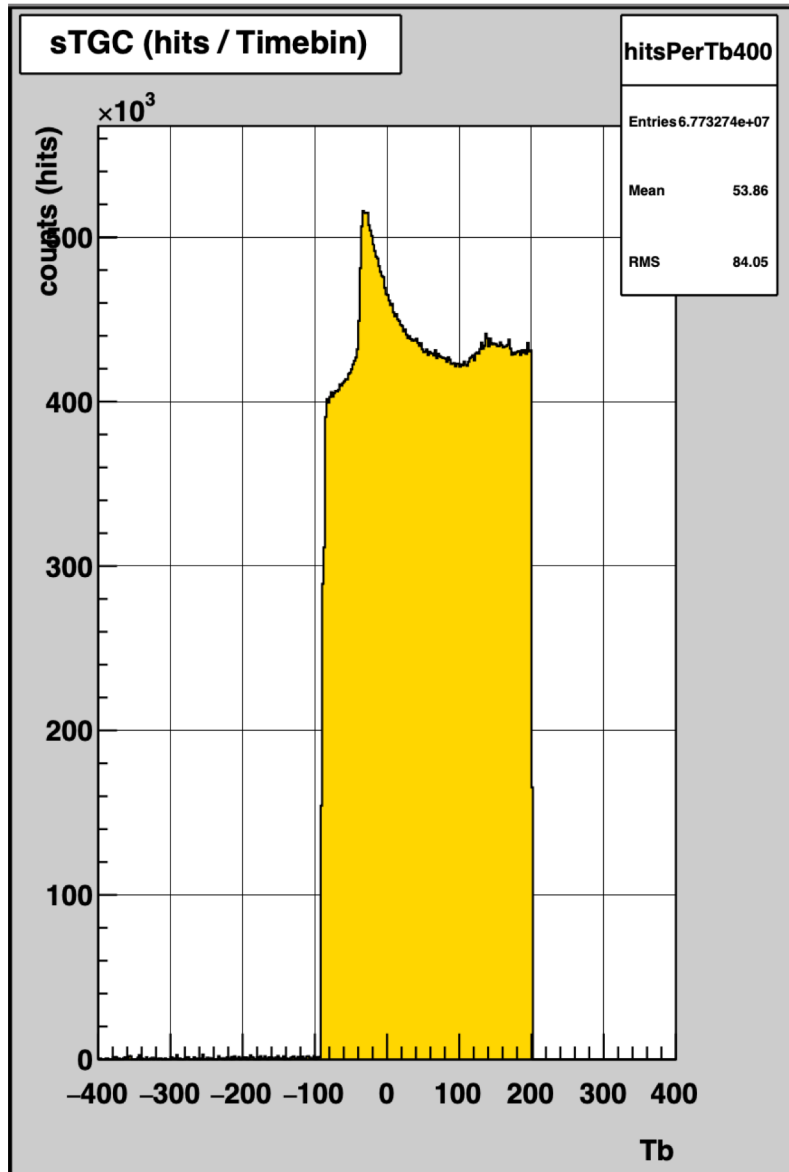
shift -> sTGC -> Charge Plane 2:



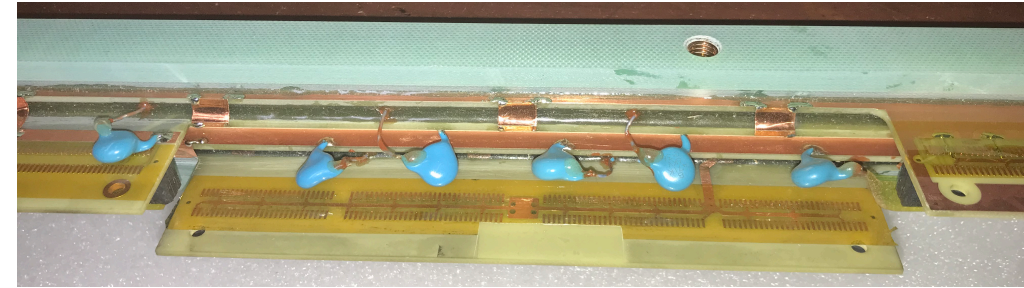
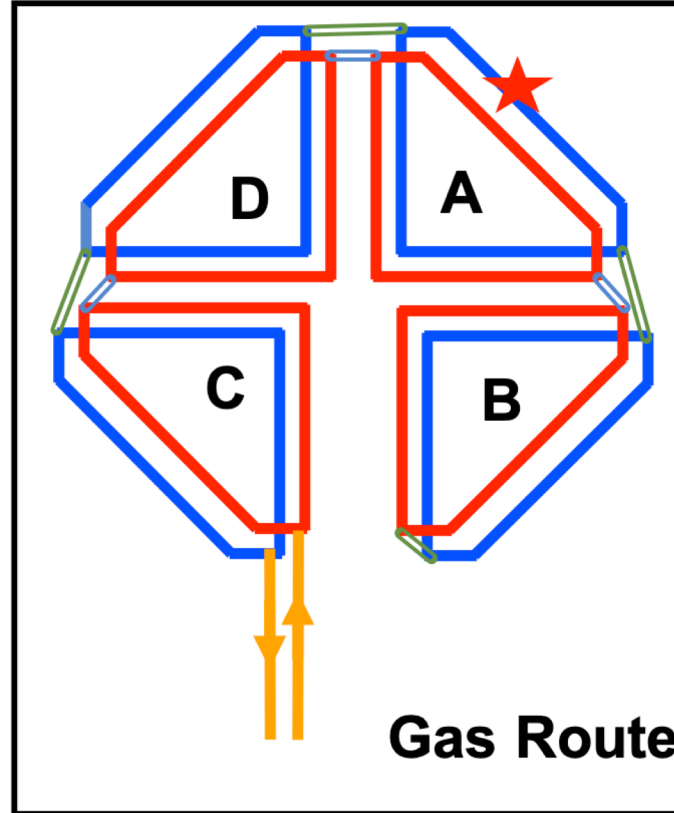
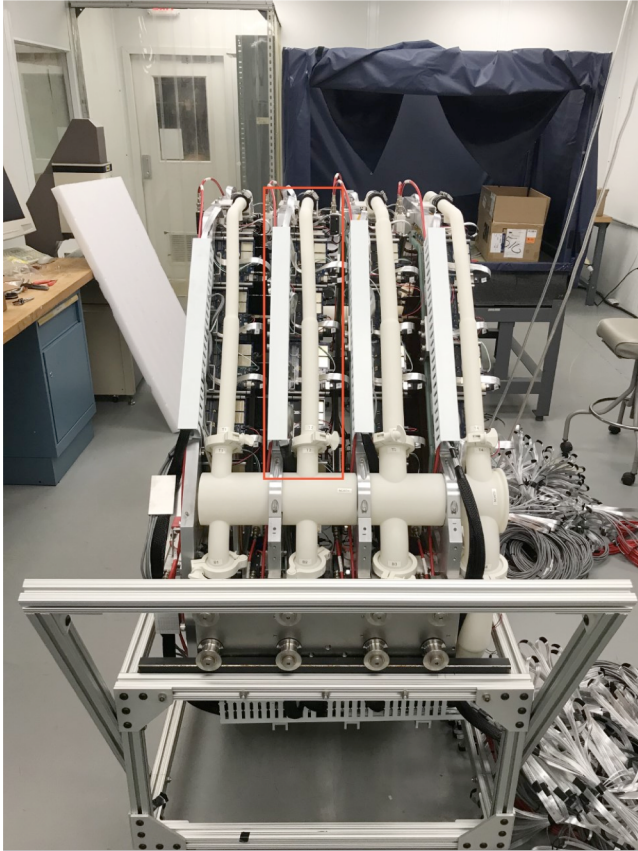
Online plots



Online plots



What can we do to bring channel 9 back



Channel Spike rate (from David)

9 ~500/h	11 ~350/h
27 ~220/h	23 ~170/h
3 ~150/h	12 ~100/h
24 ~ 90/h	15 ~ 80/h

Shutdown Activities

- Continue to flush with N₂
- Relocate gas distribution cabinet near the wall, better place
- Change clear tubes from gas distribution cabinet to the detector
 - Due to ageing
- Send gas mixing components to service
- Replace filters in the gas cabinet

- LV power supply maintenance
- CAEN power supply inspection?

- Replace bad chamber
 - May need more than a month, have enough time
 - But, don't want to introduce more problems