

Outer Tracker Upgrade Group Meeting

8 April 2026

IP2I

Arnab Purohit

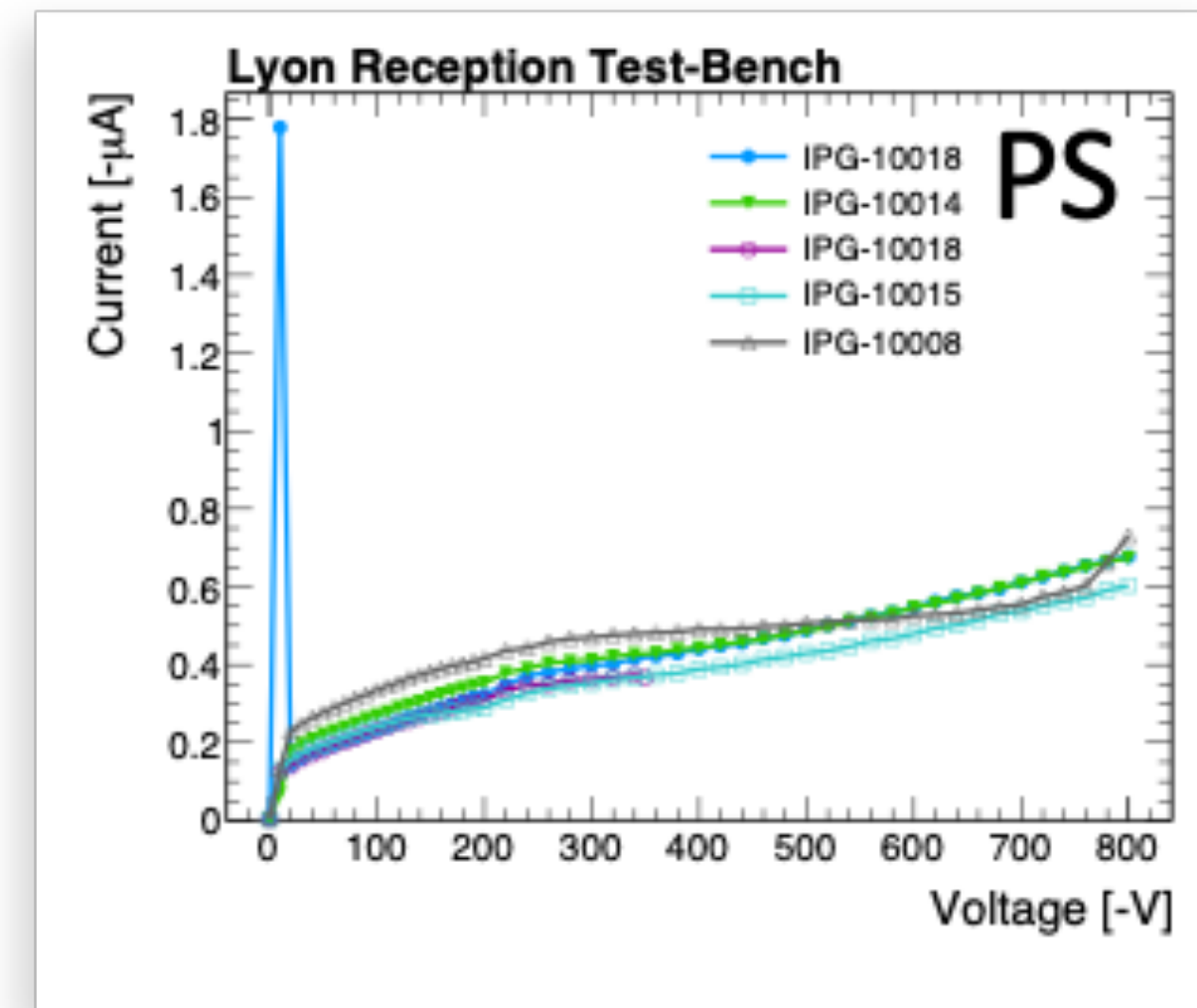
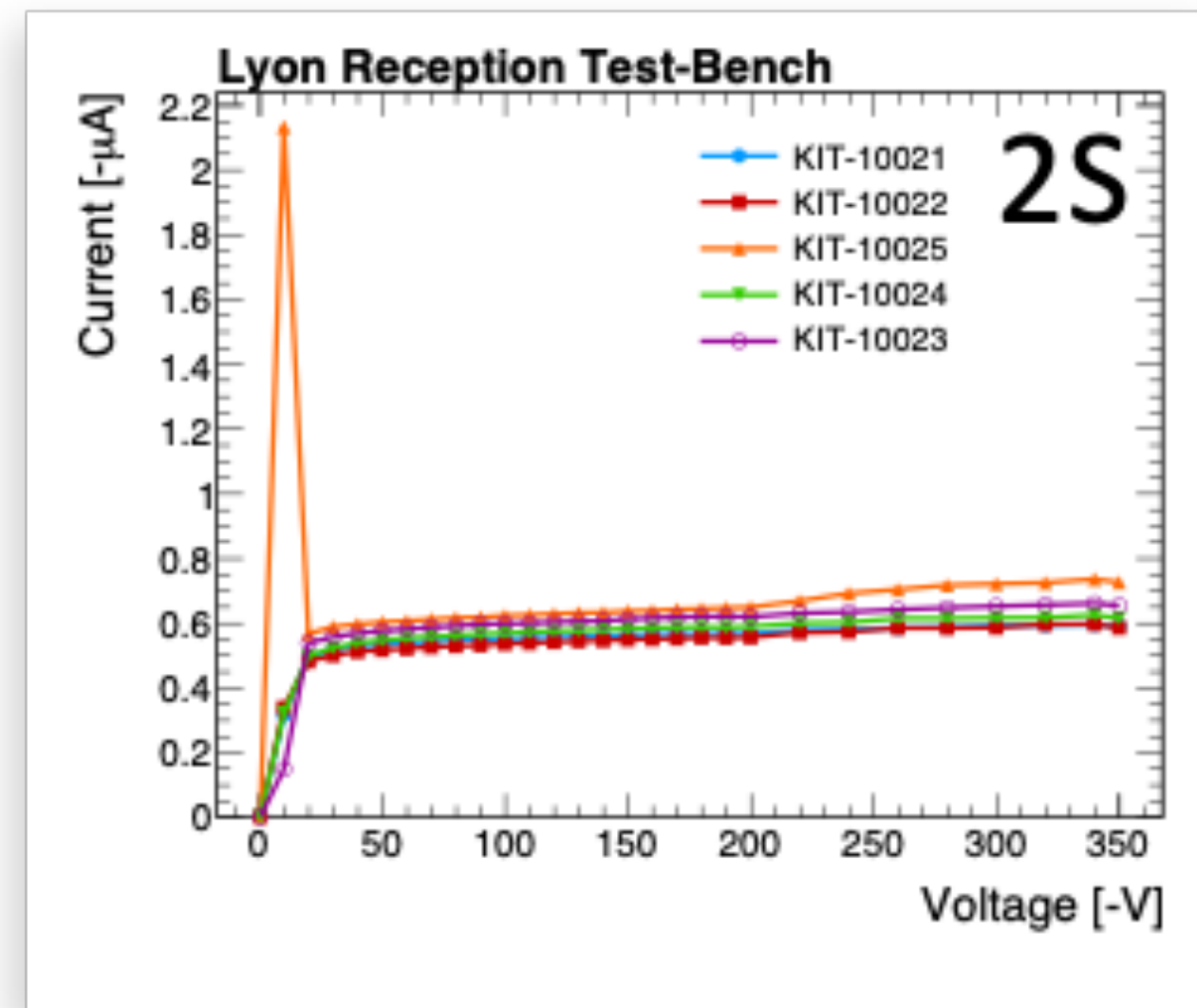
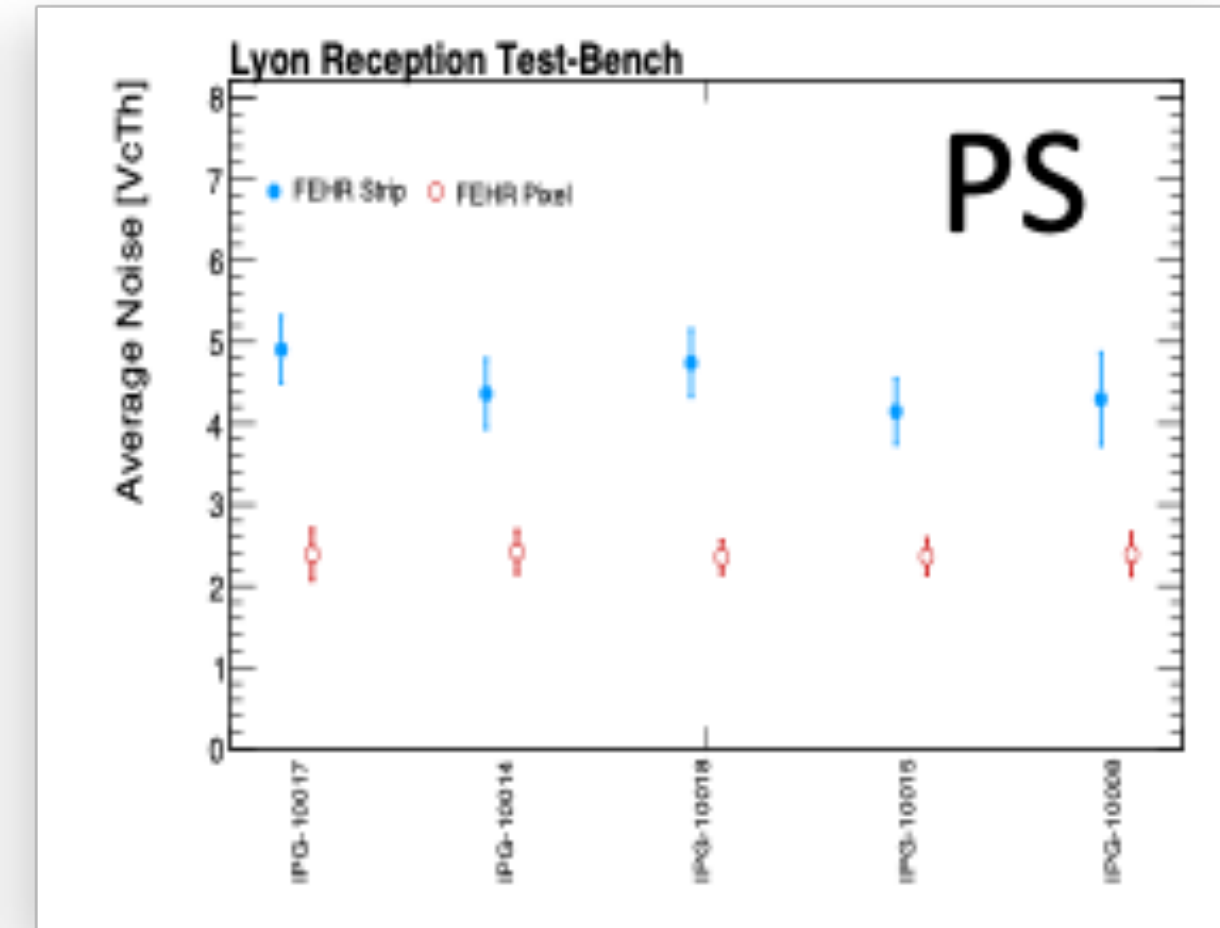
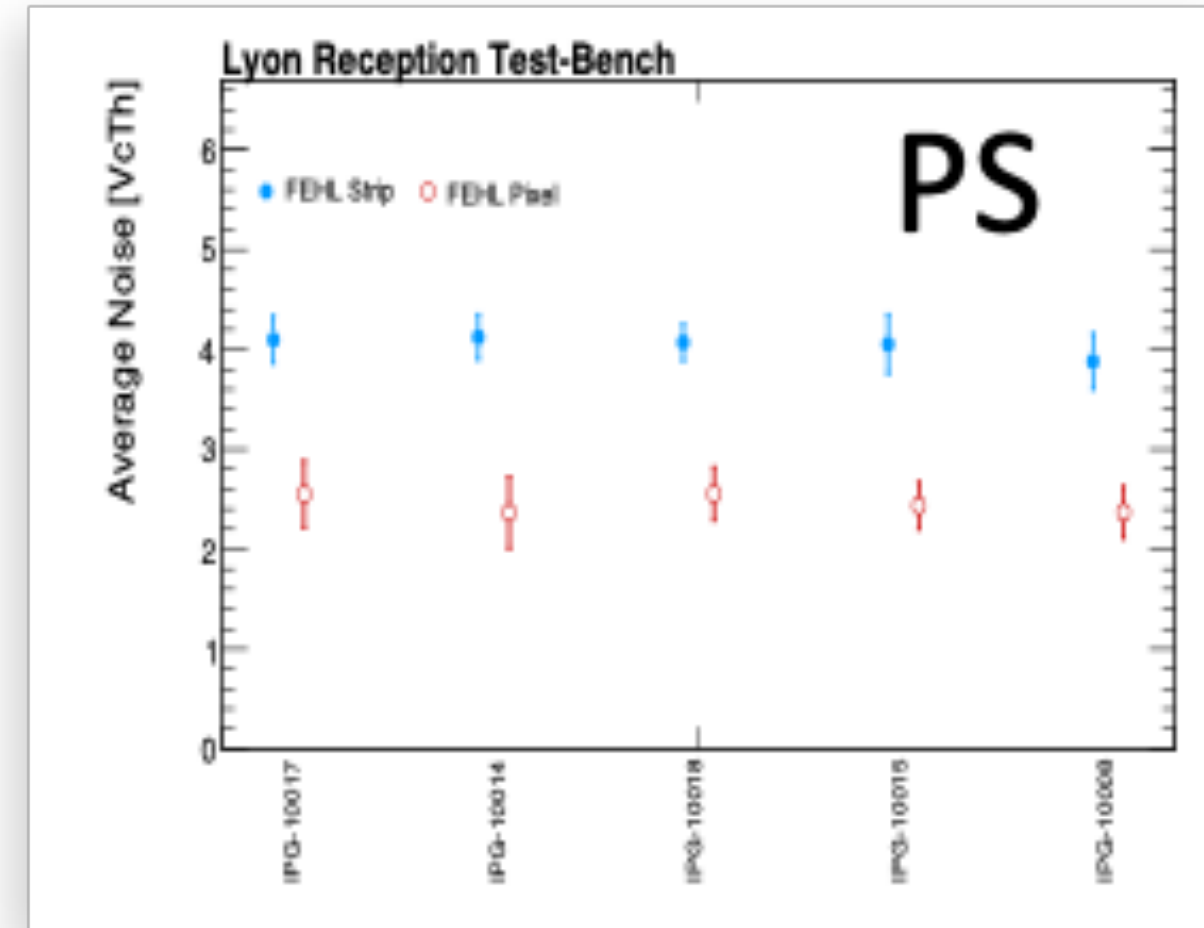
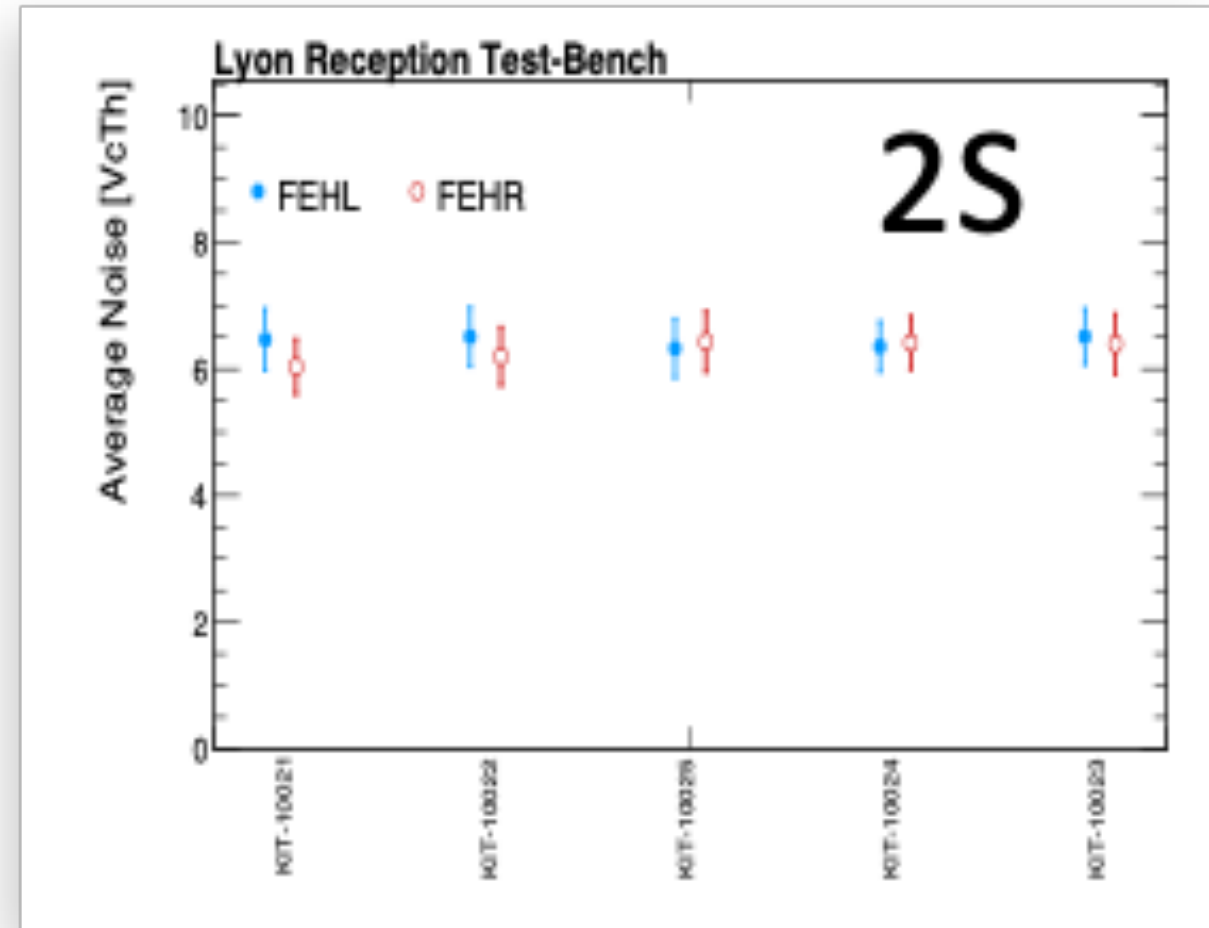
News

1. We performed tests of the 5+5 production 2S and PS.
2S Modules:
2S_40_6_KIT-10021, 2S_40_6_KIT-10022, 2S_40_6_KIT-10023,
2S_40_6_KIT-10024, 2S_40_6_KIT-10025
(PS_40_IPG-10008, PS_40_IPG-10014, PS_40_IPG-10015,
PS_40_IPG-10017, PS_40_IPG-10018
2. The 2S modules are produced in KIT, and none of them have SEH glued.
 1. SEHs are removed from already finished modules because of the bPOL problem.
3. The PS modules are produced at Perugia. ROH is glued for all of them.

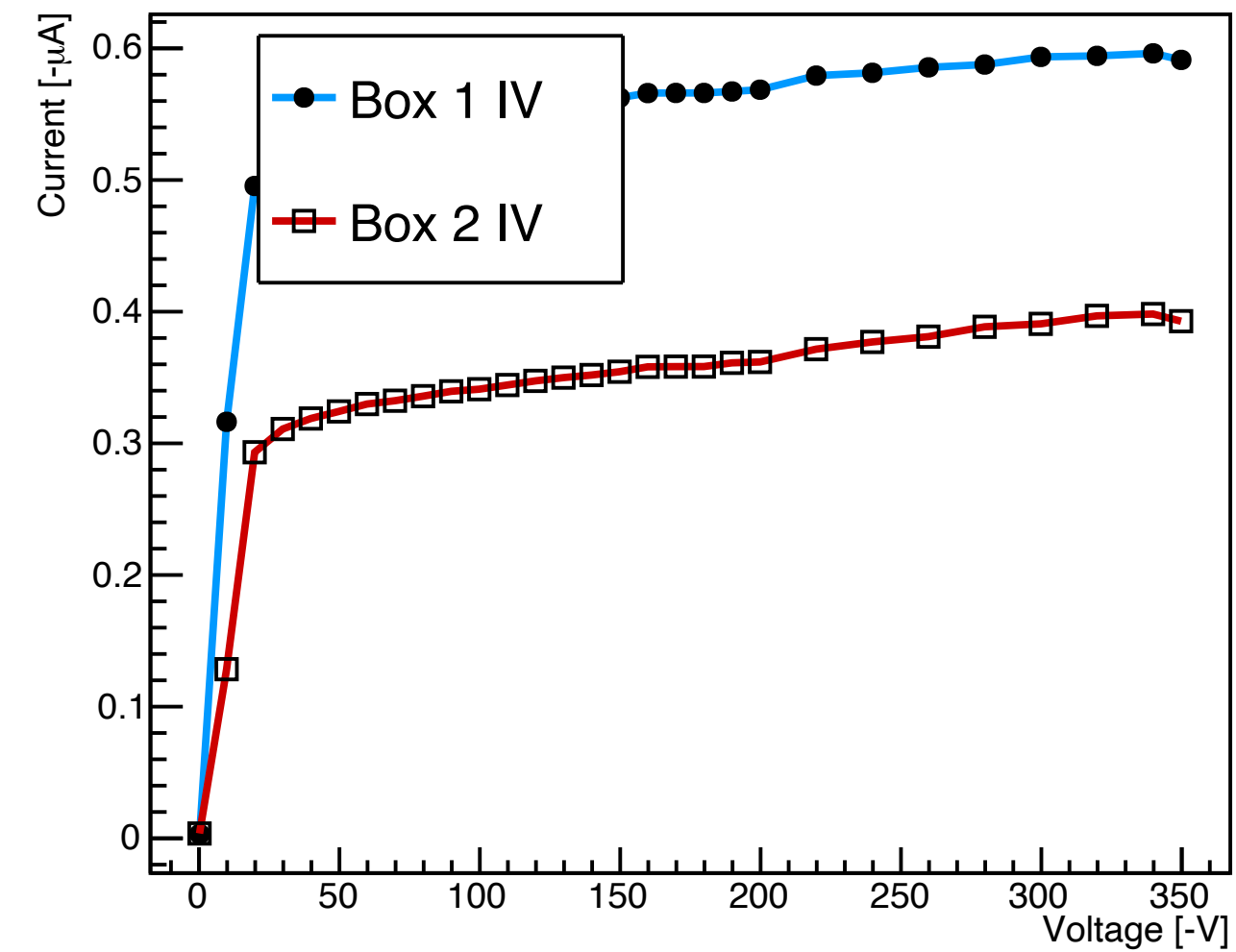
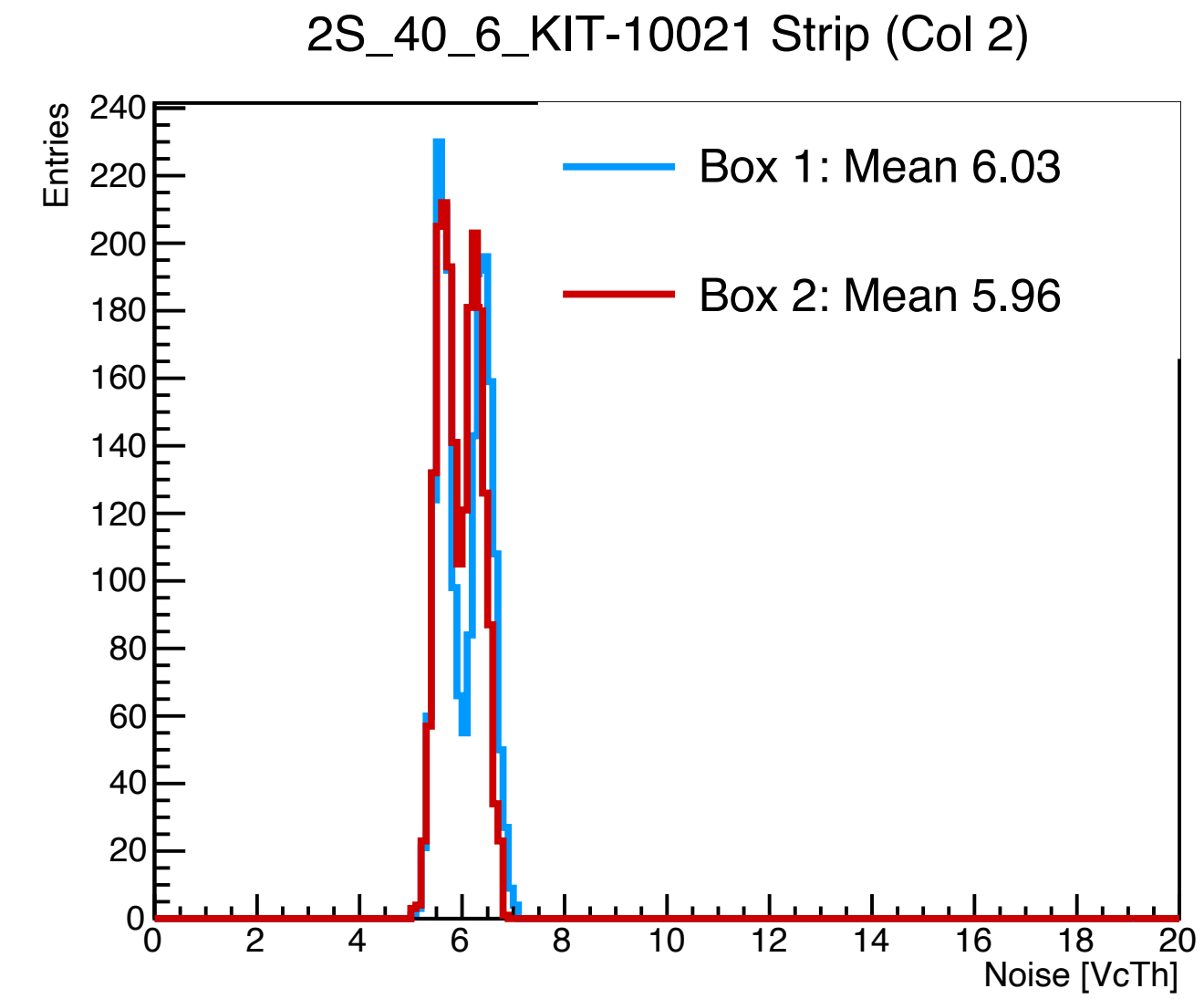
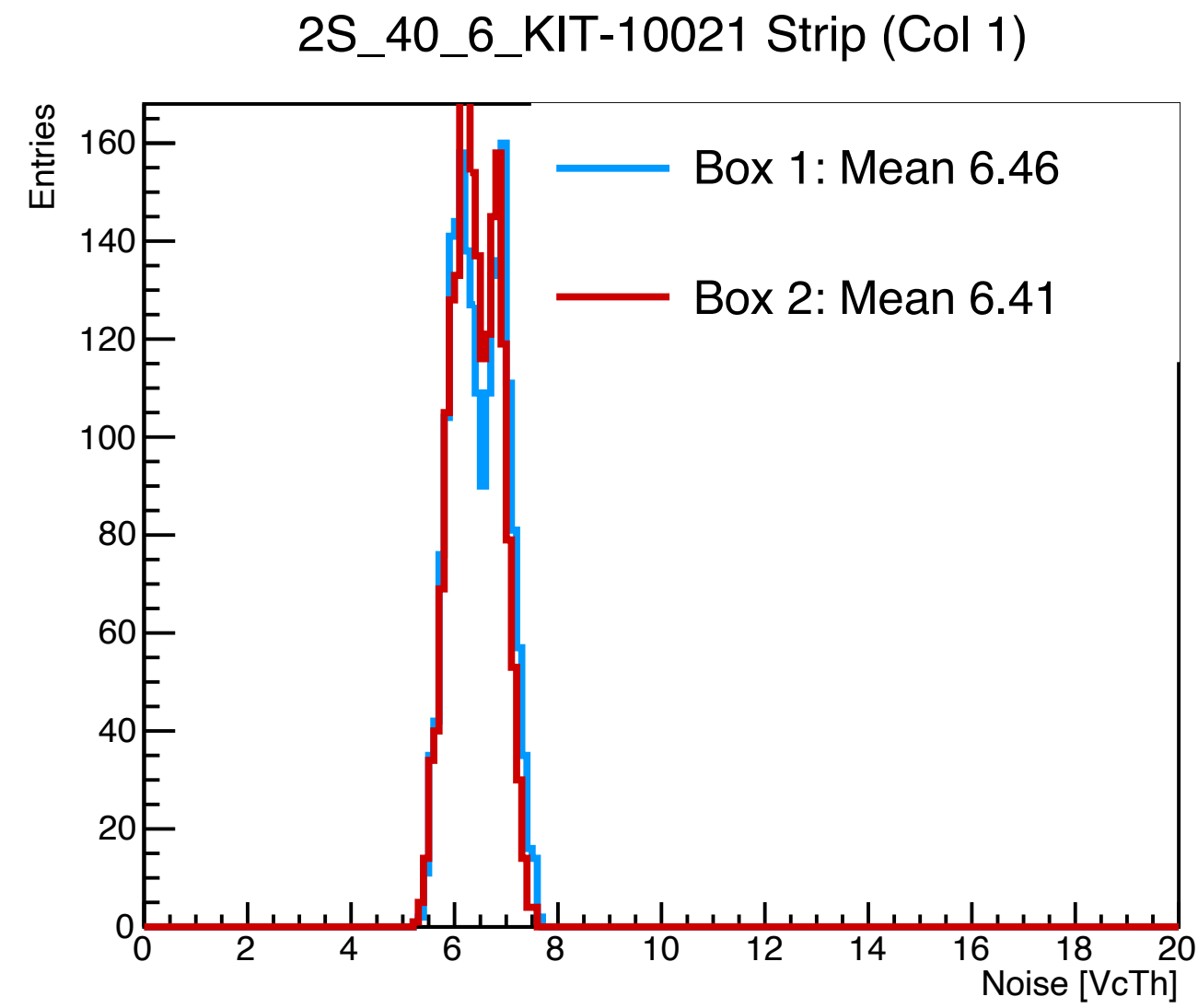
Tests done so far

	Module	ID		Test Type		Date		Temp	
	2S_40_6	KIT-10021		quickTest		2026-03-11		+24C	
				fullTest		2026-03-04		+22C	
	2S_40_6	KIT-10022		quickTest		2026-03-11		+24C	
				fullTest		2026-02-23		0C	
				fullTest		2026-02-23		+20C	
				quickTest		2026-02-23		+20C	
	2S_40_6	KIT-10023		fullTest		2026-03-25		+23C	
				quickTest		2026-03-25		+24C	
				fullTest		2026-03-25		+24C	
				quickTest		2026-03-10		+23C	
	2S_40_6	KIT-10024		quickTest		2026-03-10		+24C	
	2S_40_6	_KIT-10025		quickTest		2026-03-10		+24C	
	PS_40	IPG-10008		fullTest		2026-04-02		+22C	
				quickTest		2026-03-11		+24C	
	PS_40	IPG-10014		quickTest		2026-03-11		+23C	
	PS_40	IPG-10015		quickTest		2026-03-11		+23C	
				fullTest		2026-03-11		+23C	
	PS_40	IPG-10017		fullTest		2026-03-06		+22C	
				fullTest		2026-03-04		+25C	
				quickTest		2026-03-03		+24C	
				quickTest		2026-03-03		+0C	
	PS_40	IPG-10018		quickTest		2026-03-10		+23C	
				quickTest		2026-03-10		+23C	

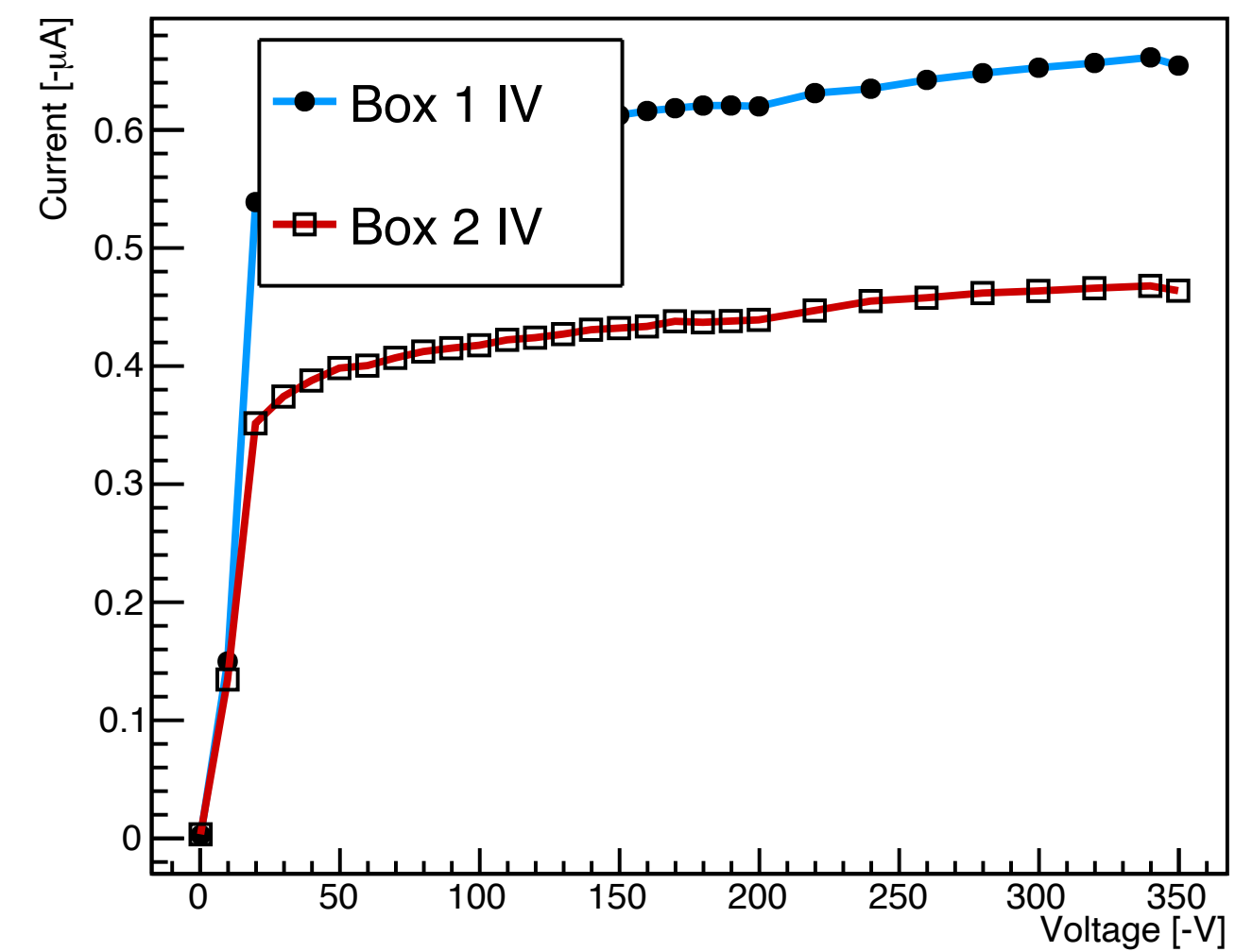
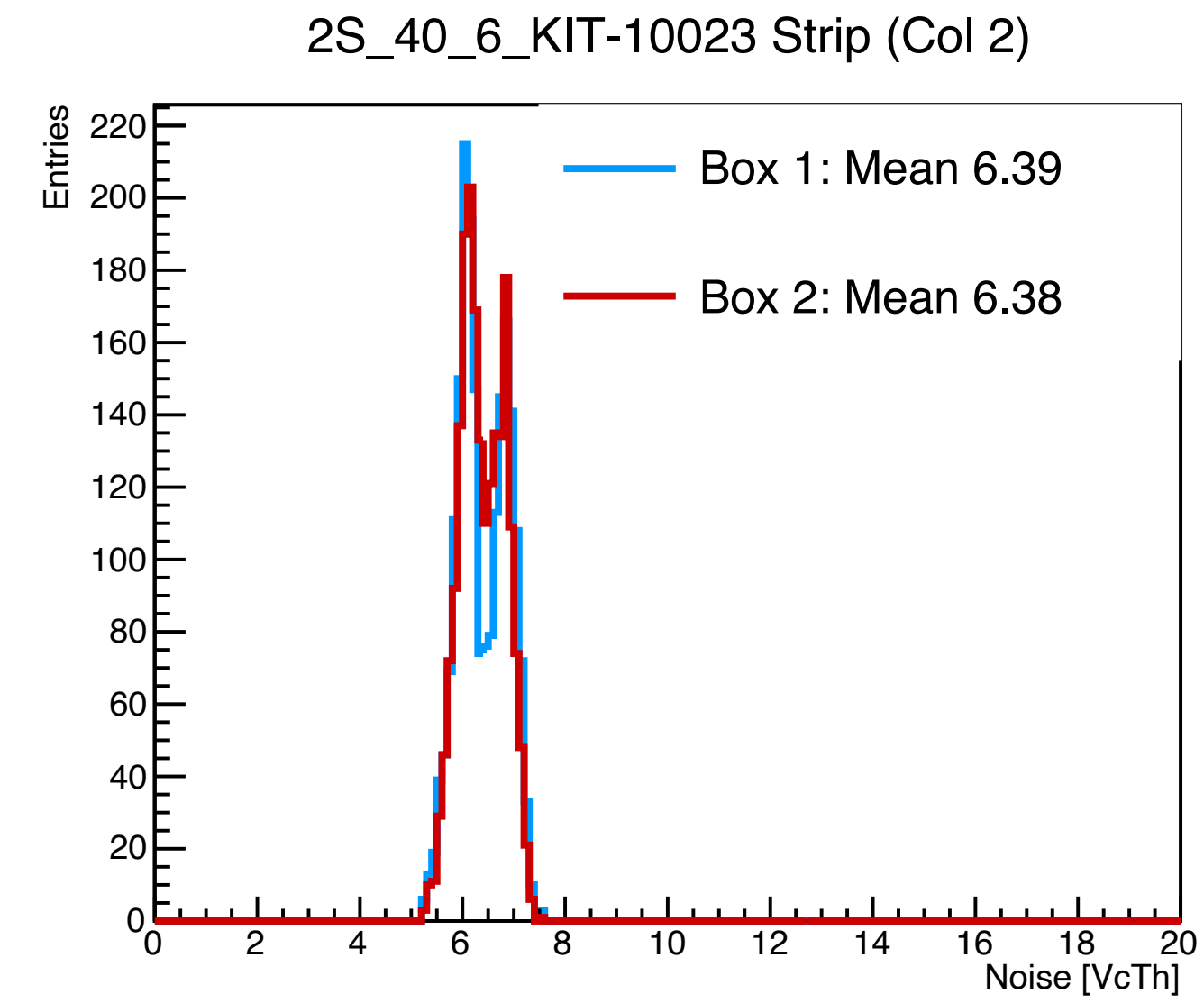
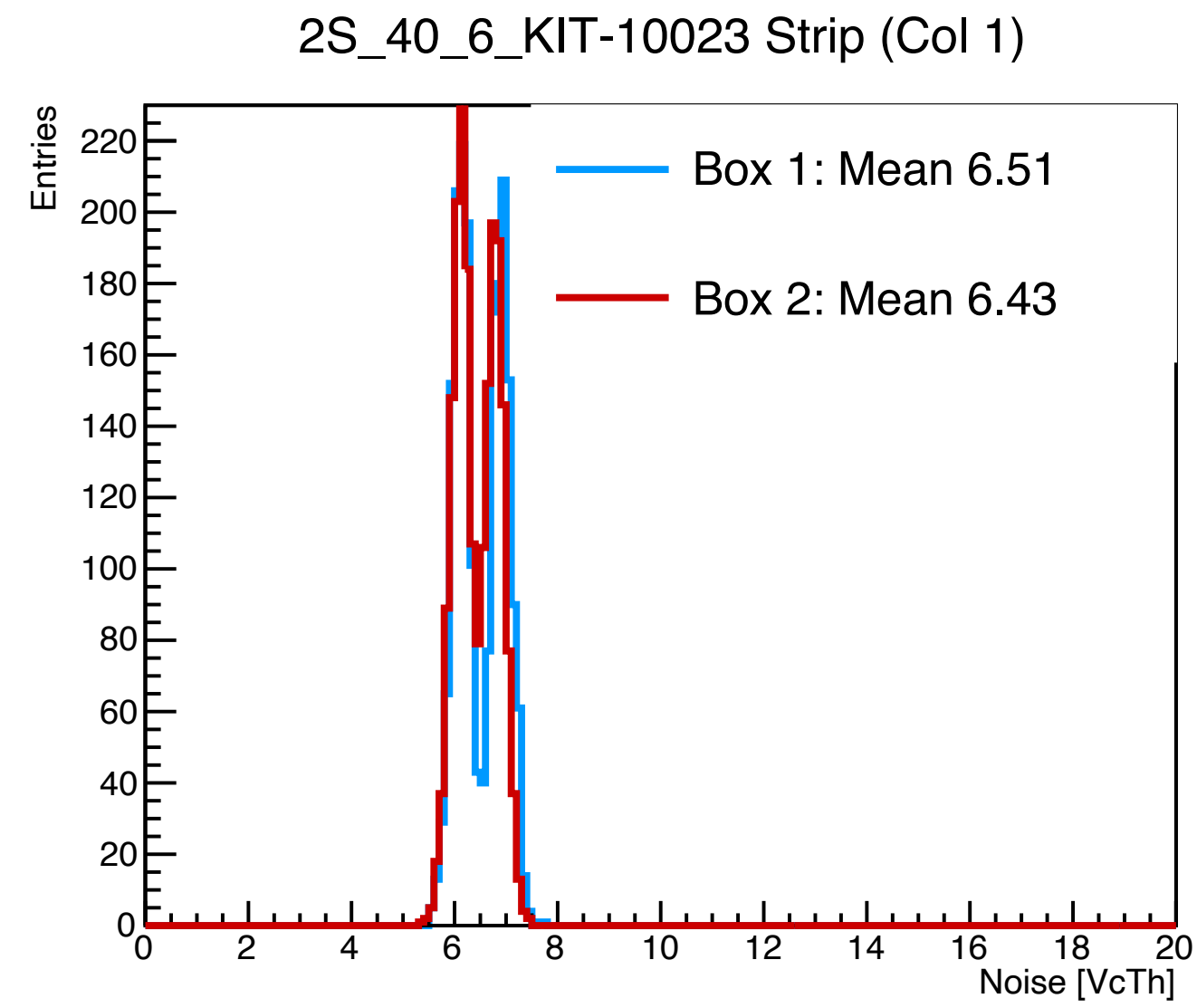
Summary of results



Comparison between the two test benches

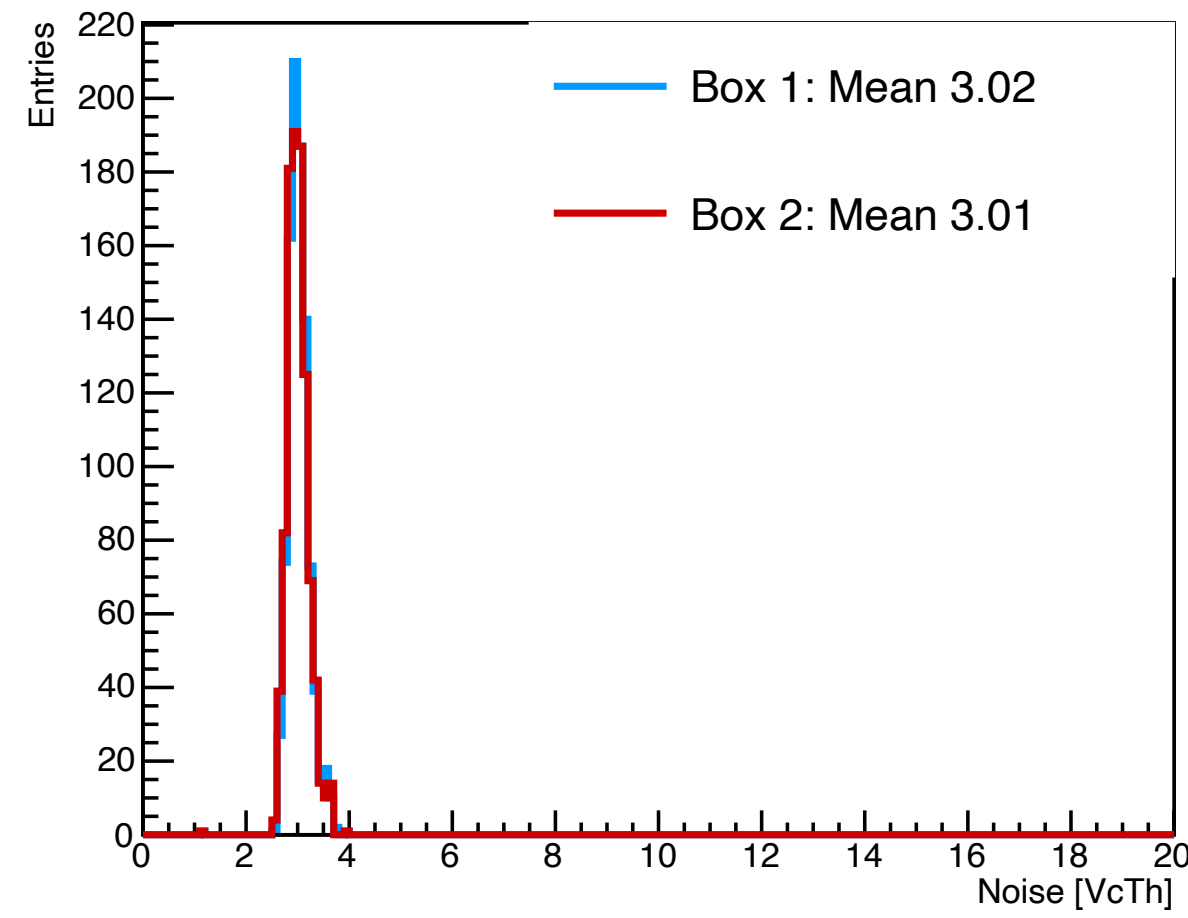


Comparison between the two test benches

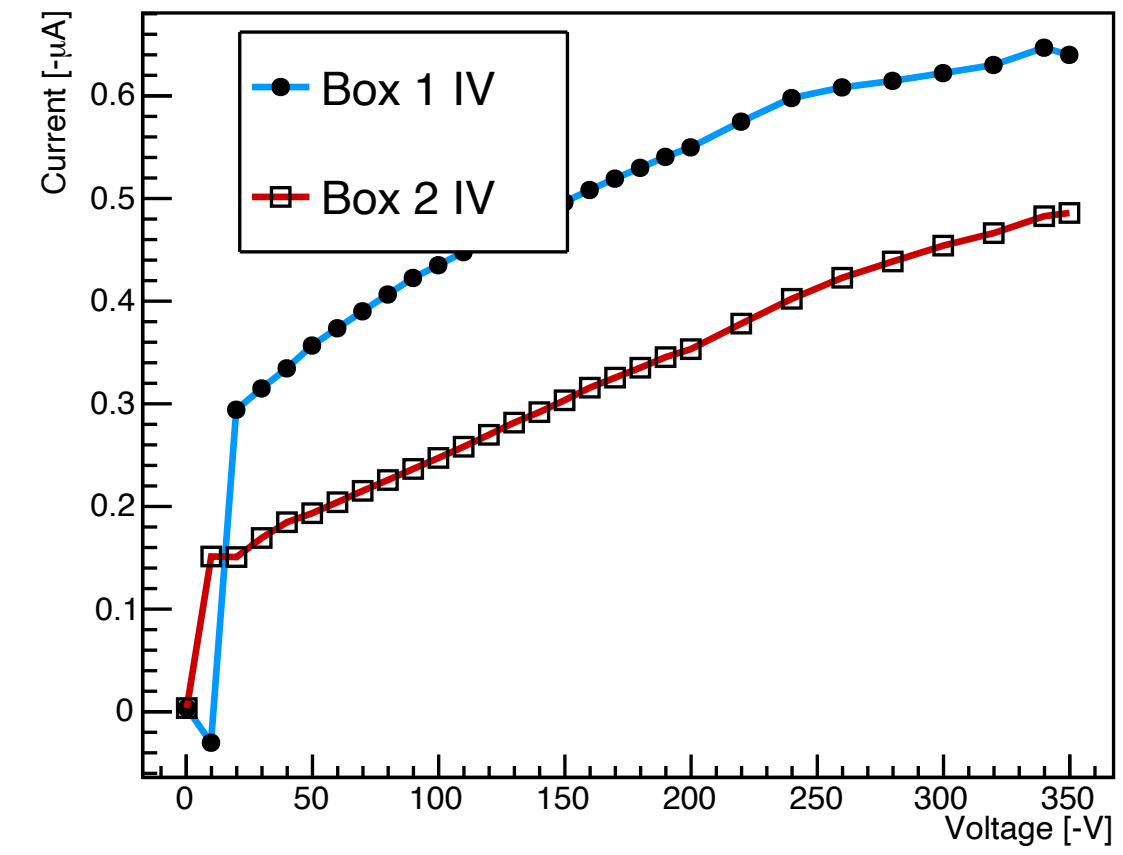
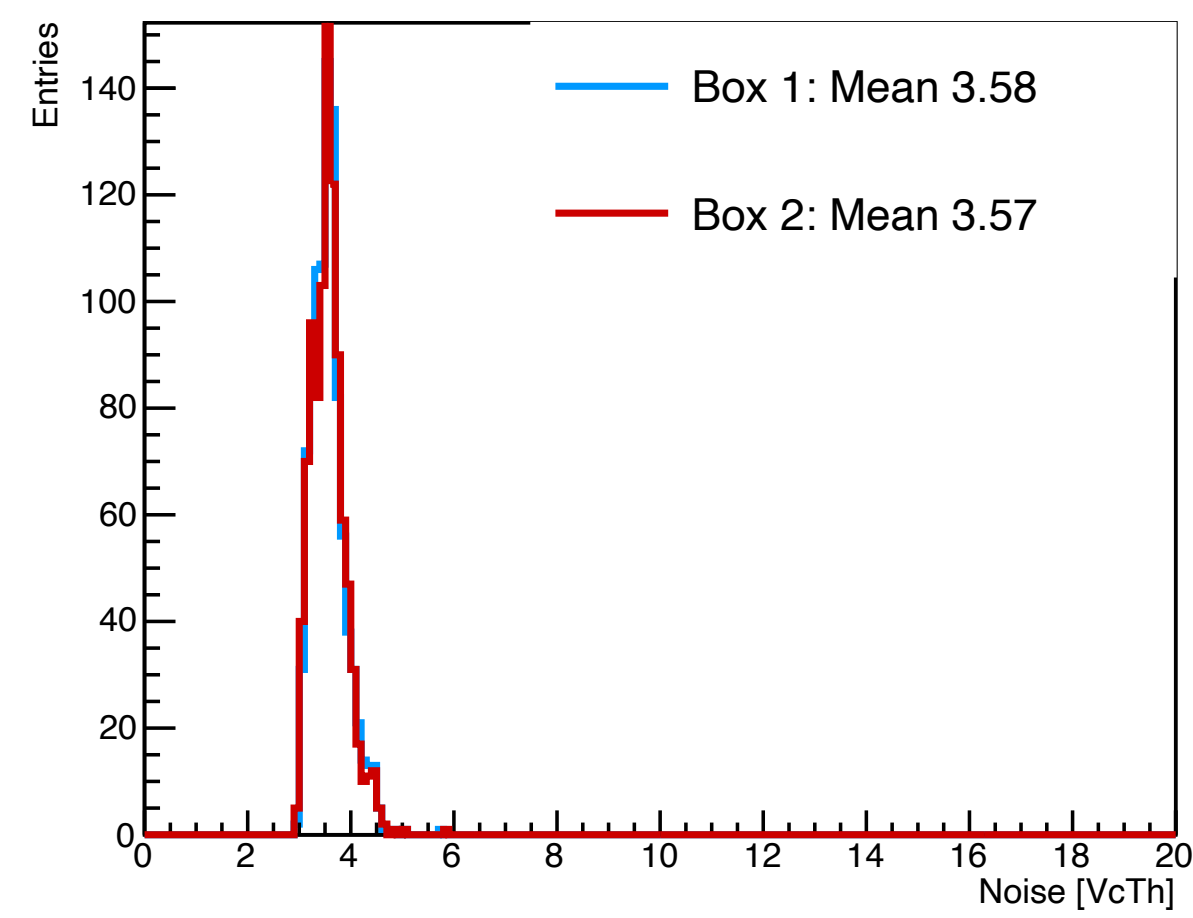


Comparison between the two test benches

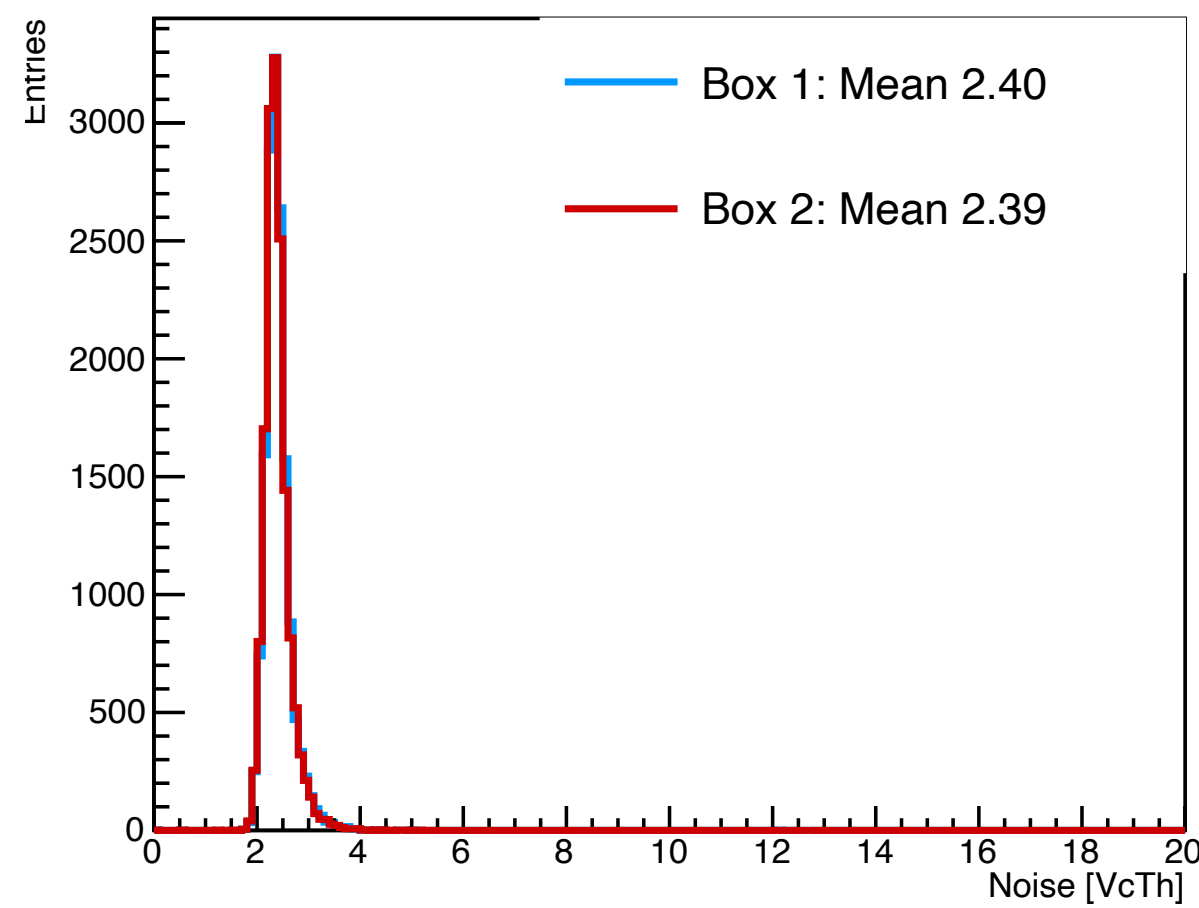
PS_40_IPG-10017 Strip (Col 1)



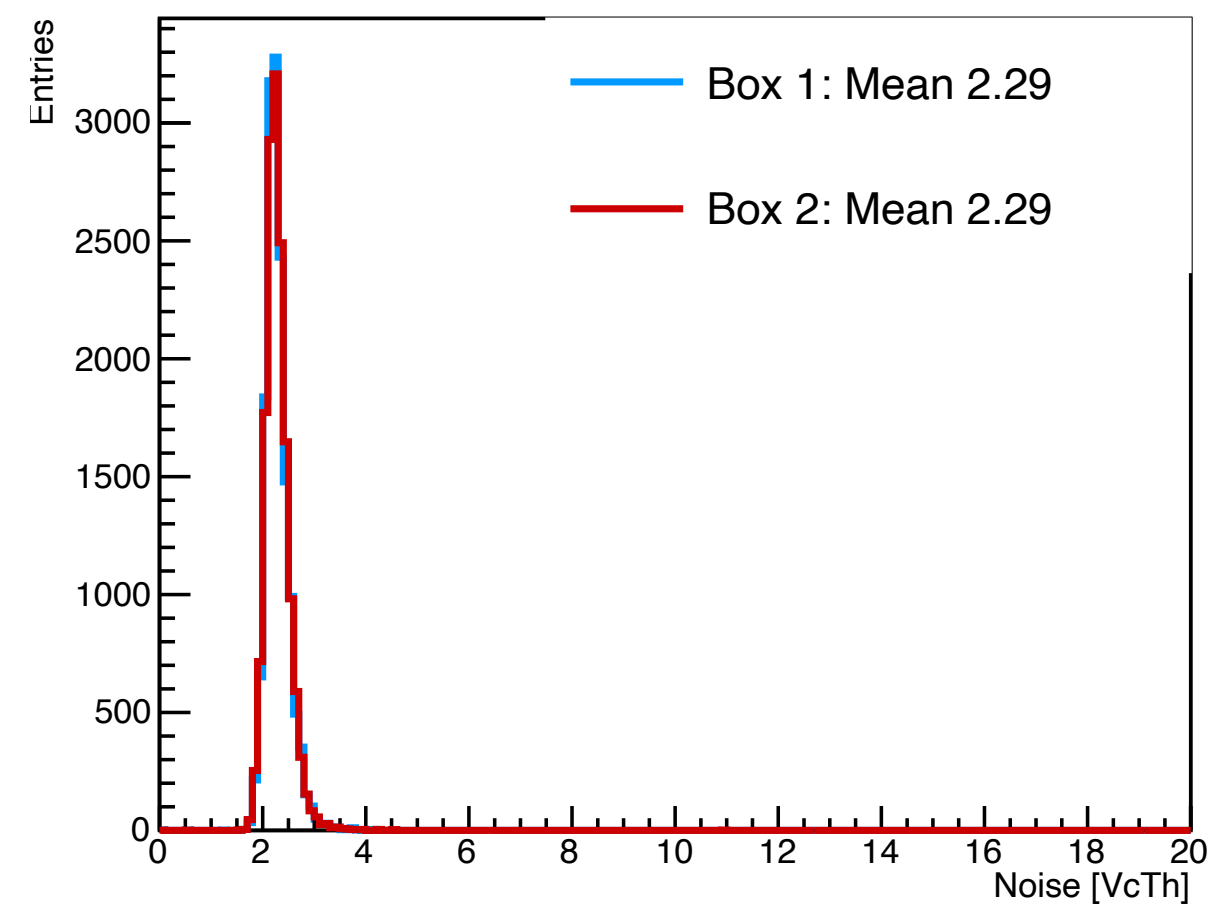
PS_40_IPG-10017 Strip (Col 2)



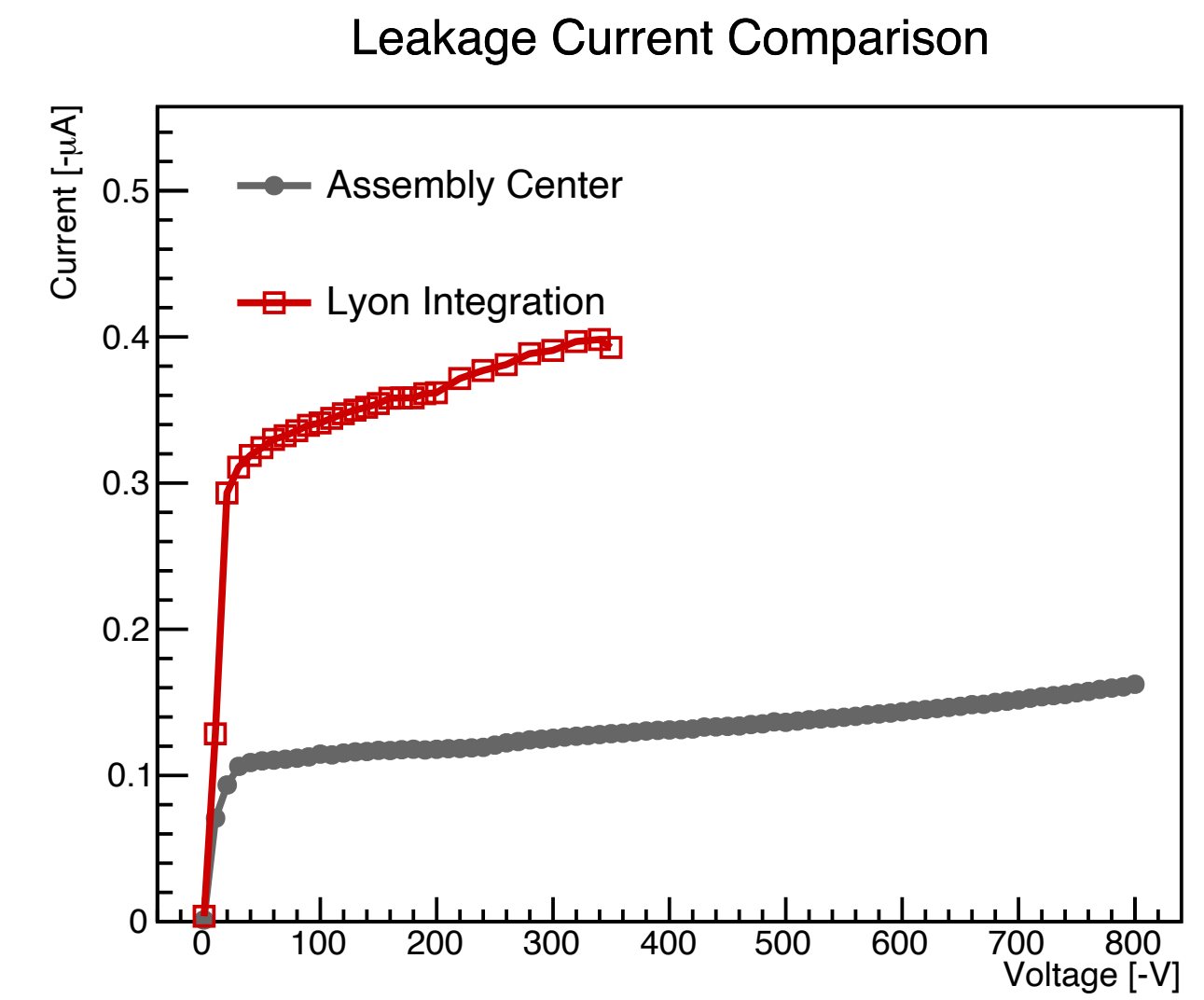
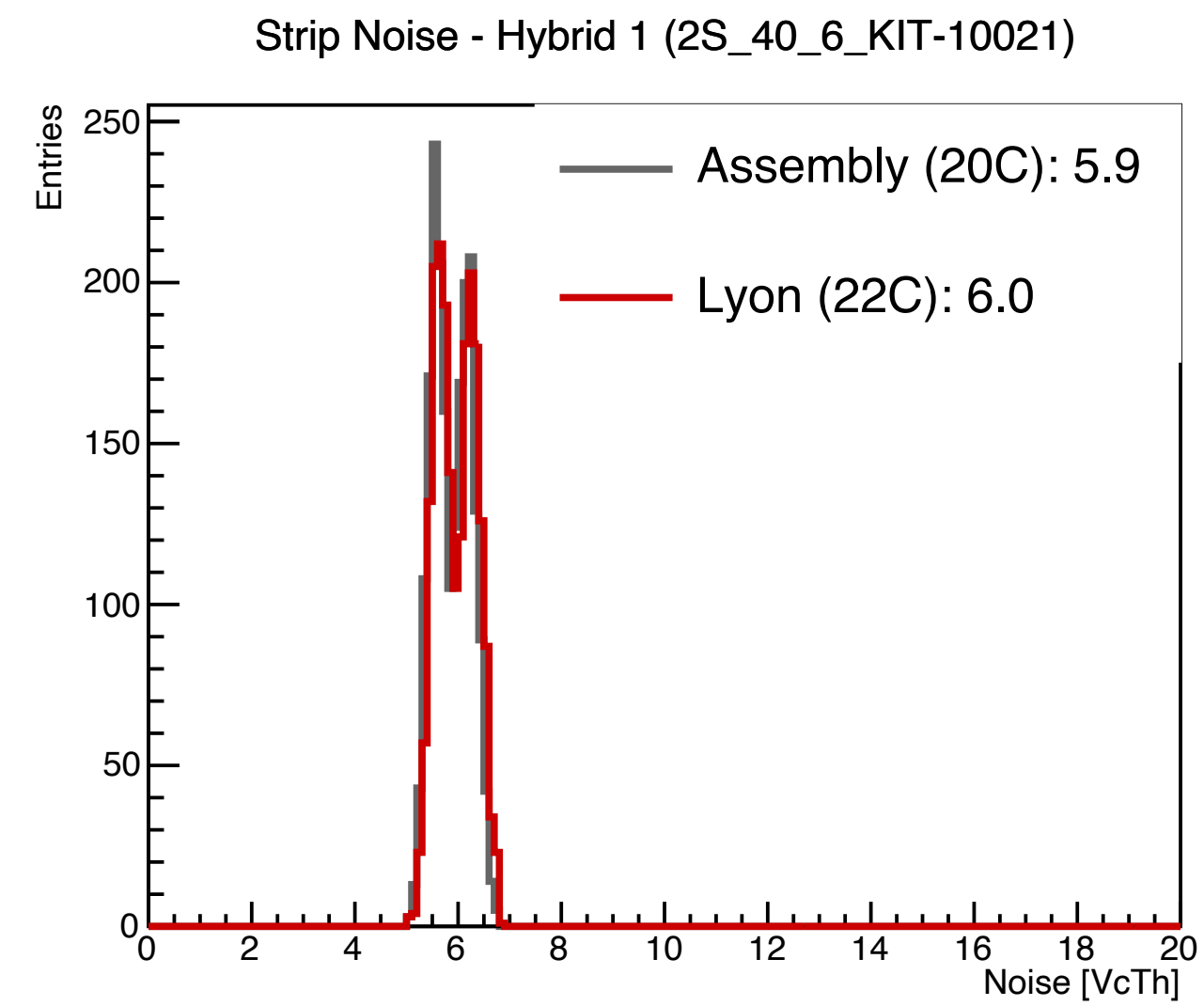
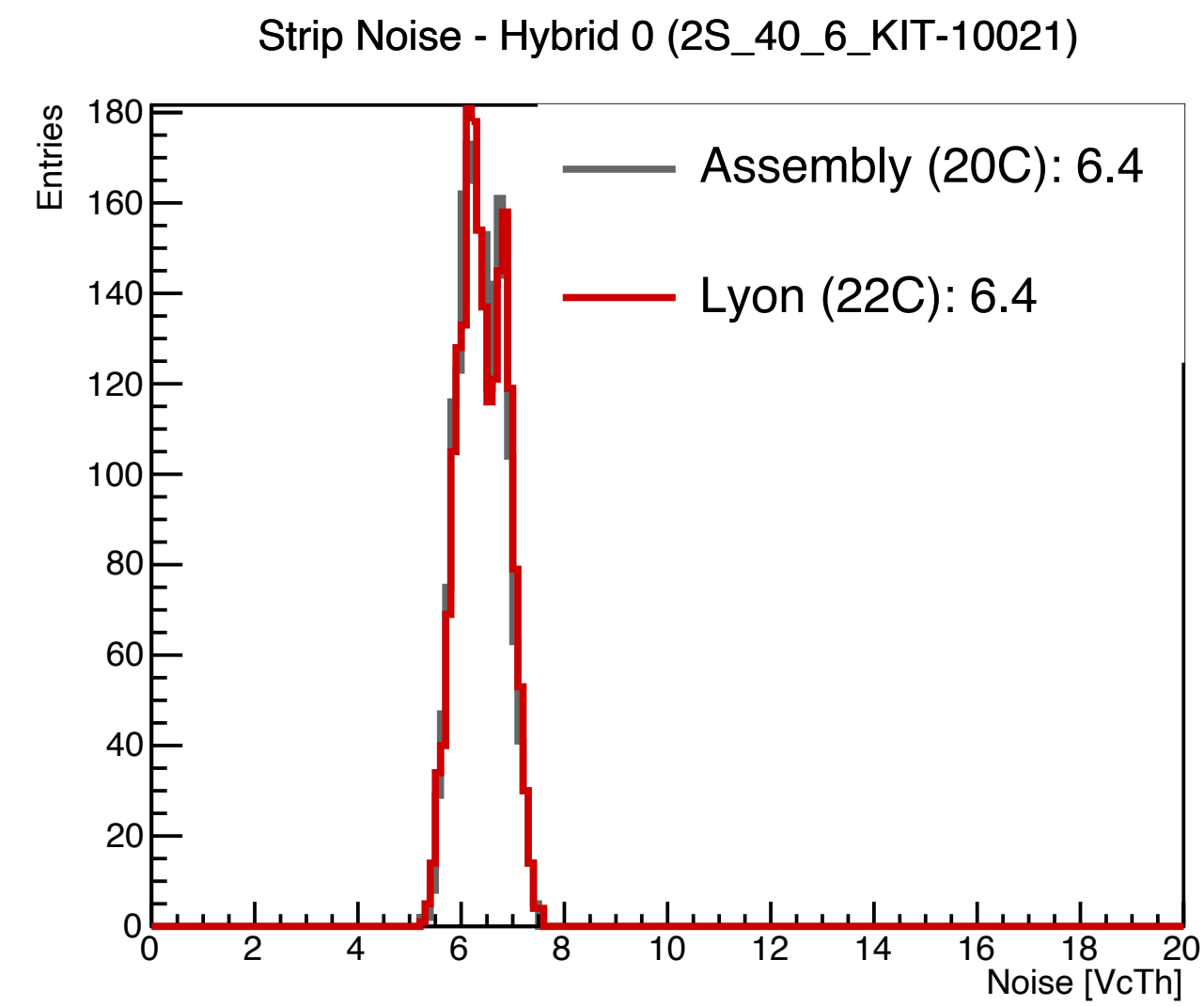
PS_40_IPG-10017 Pixel (Col 1)



PS_40_IPG-10017 Pixel (Col 2)

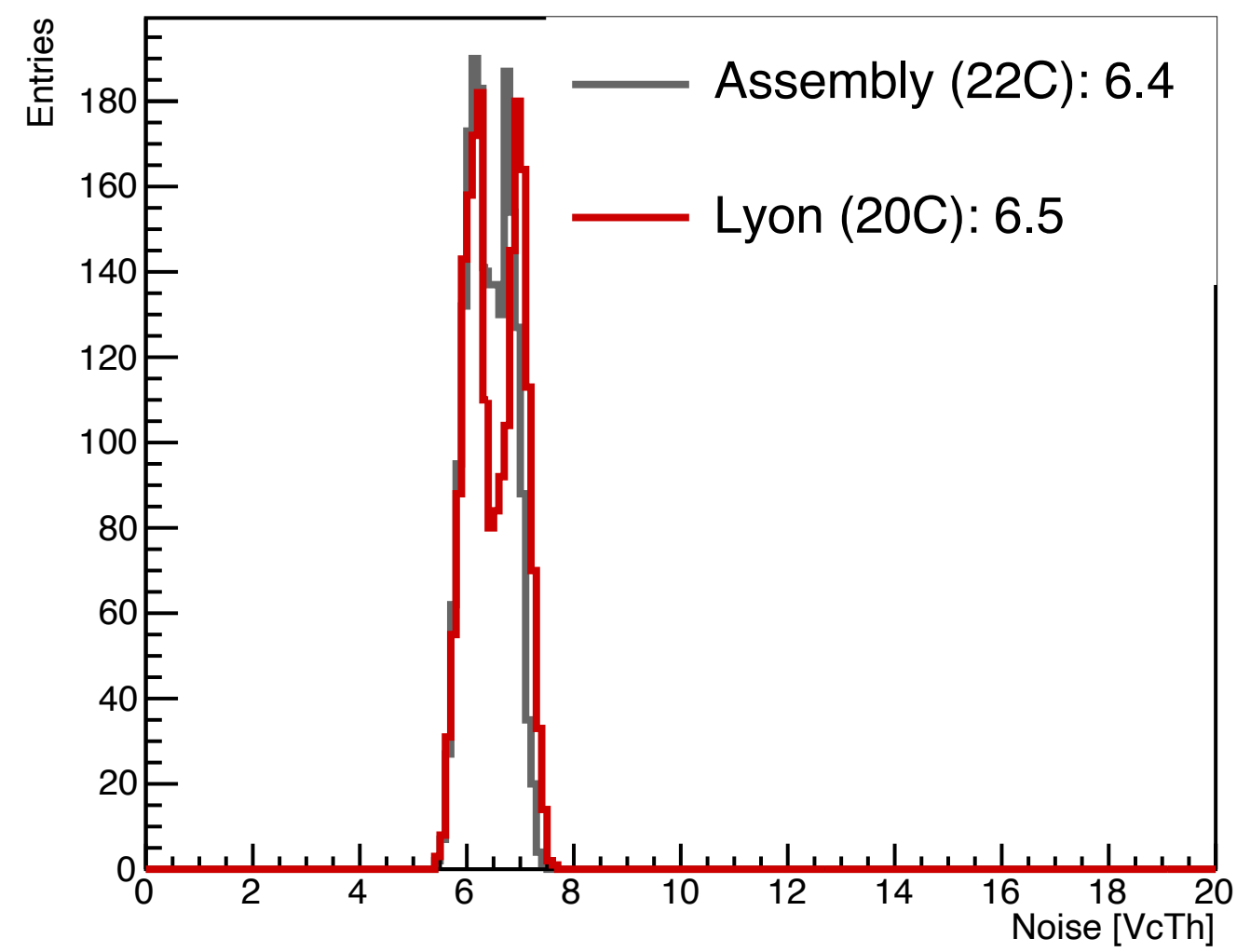


Comparison between Assembly and Integration site

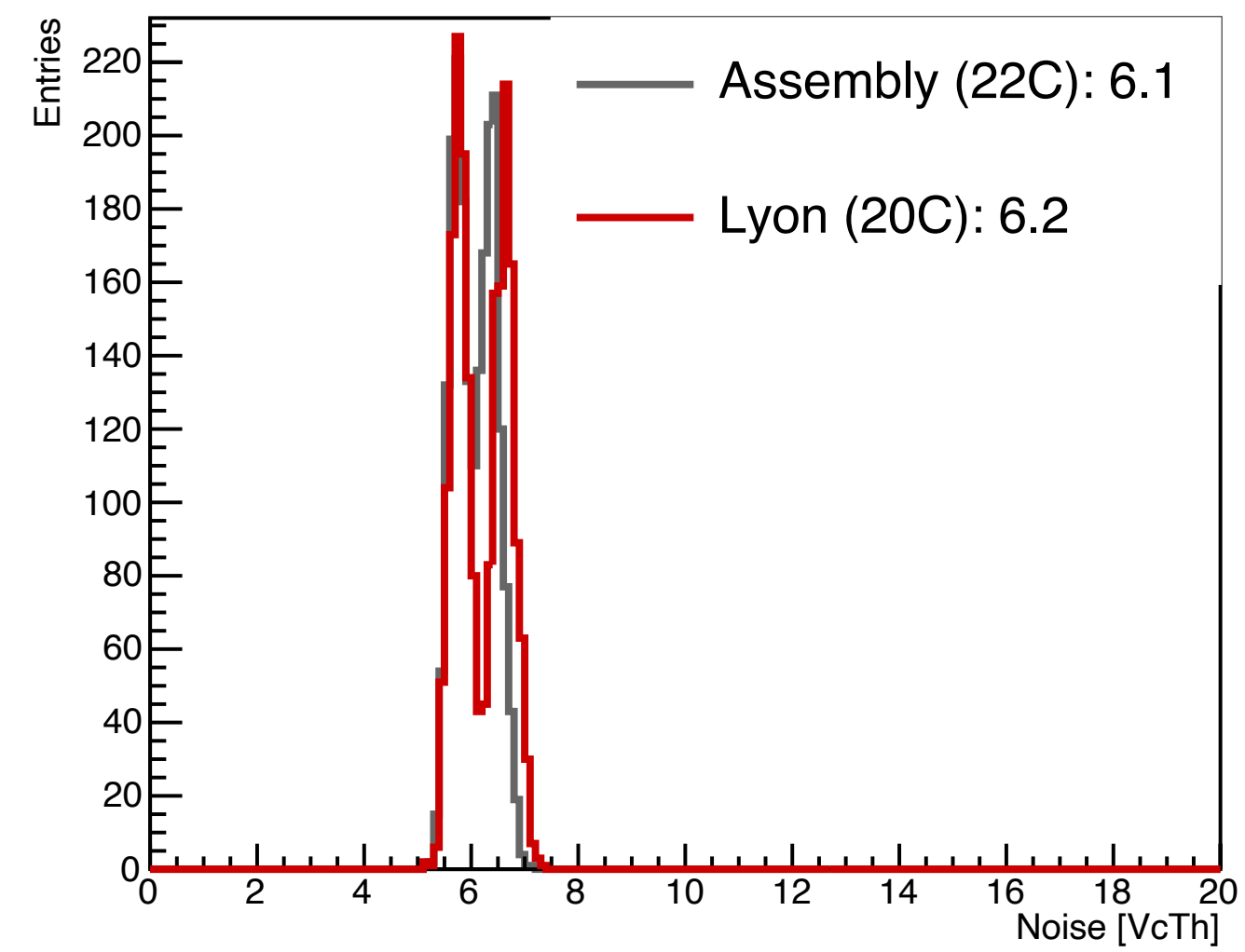


Comparison between Assembly and Integration site

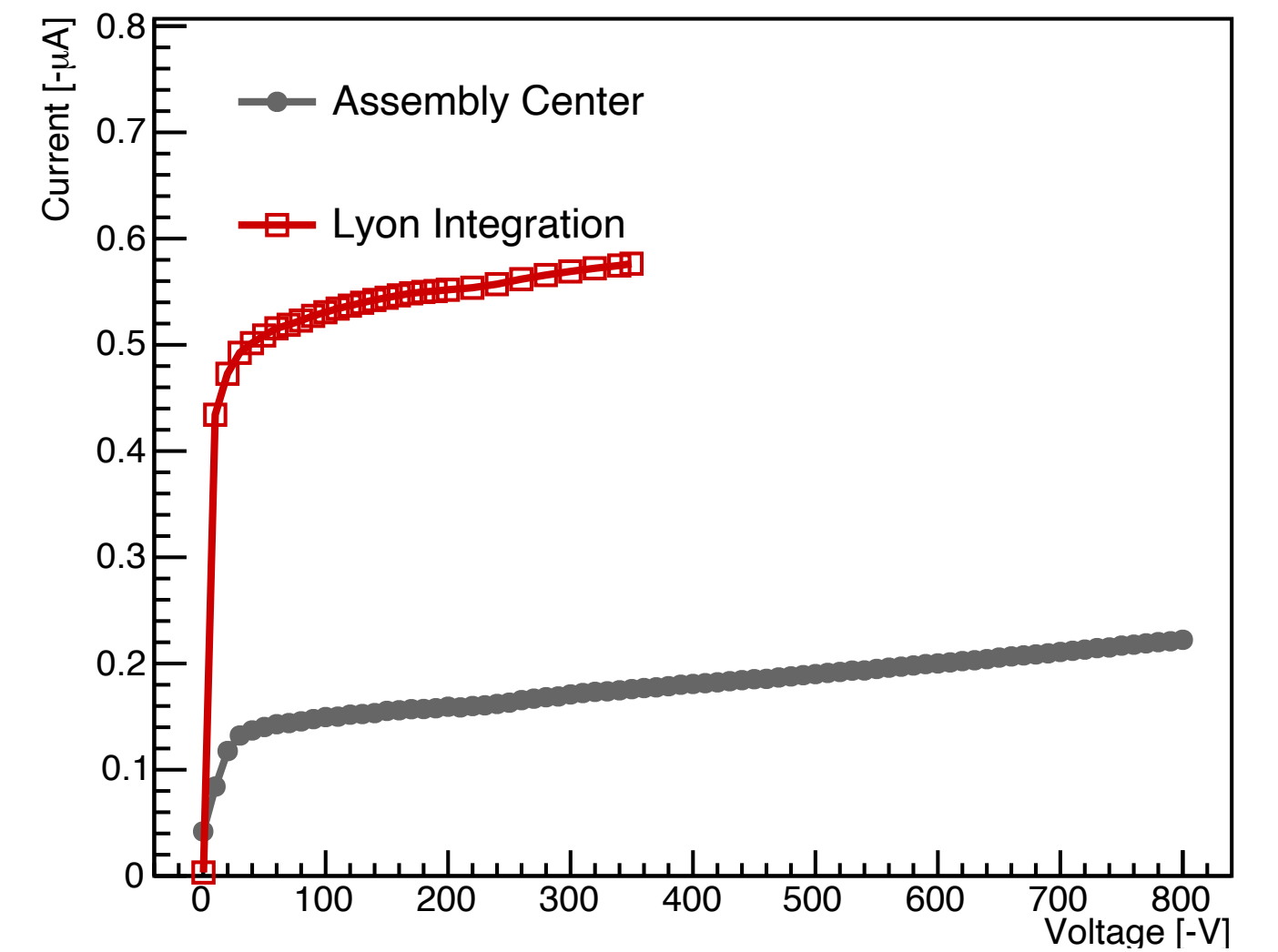
Strip Noise - Hybrid 0 (2S_40_6_KIT-10022)



Strip Noise - Hybrid 1 (2S_40_6_KIT-10022)

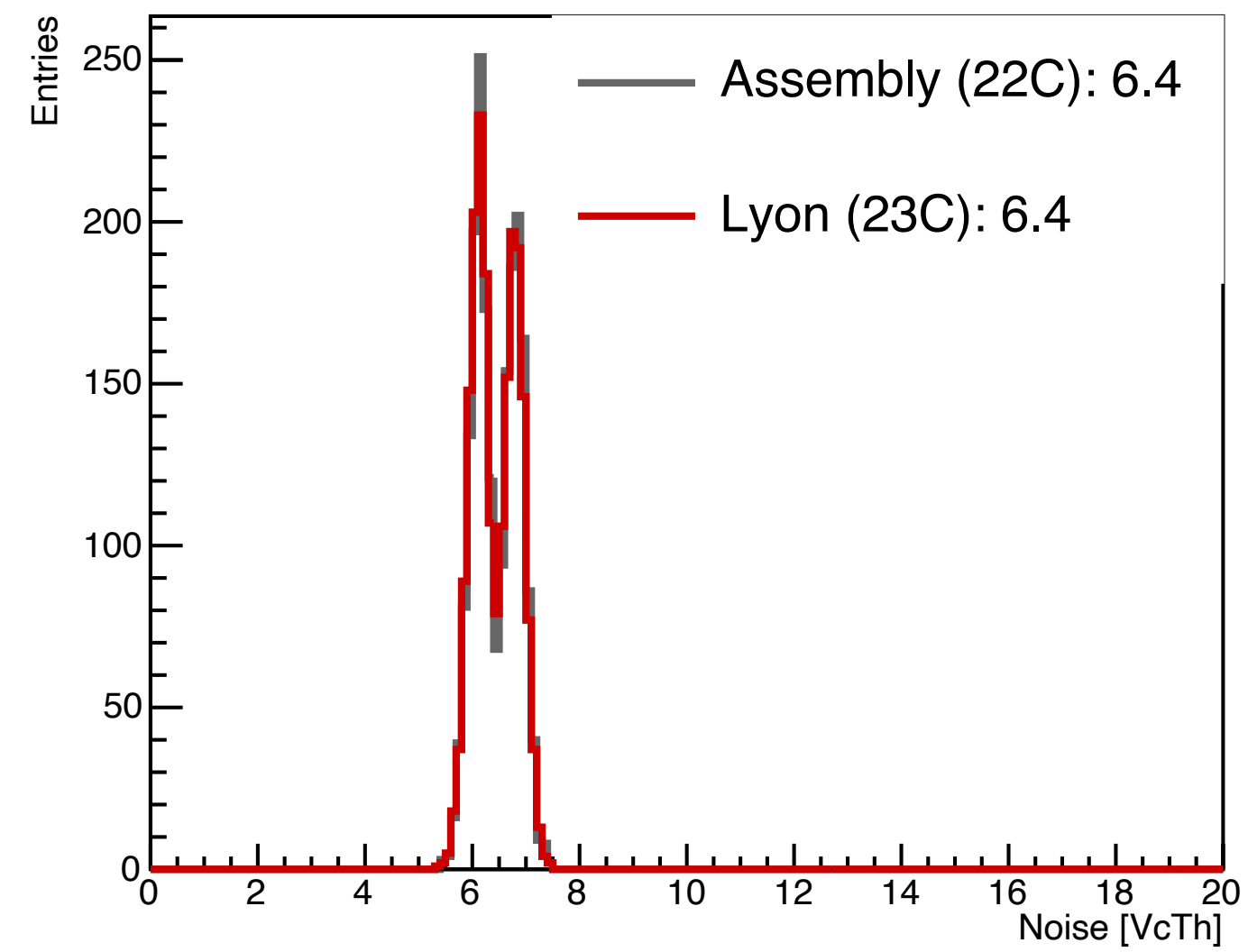


Leakage Current Comparison

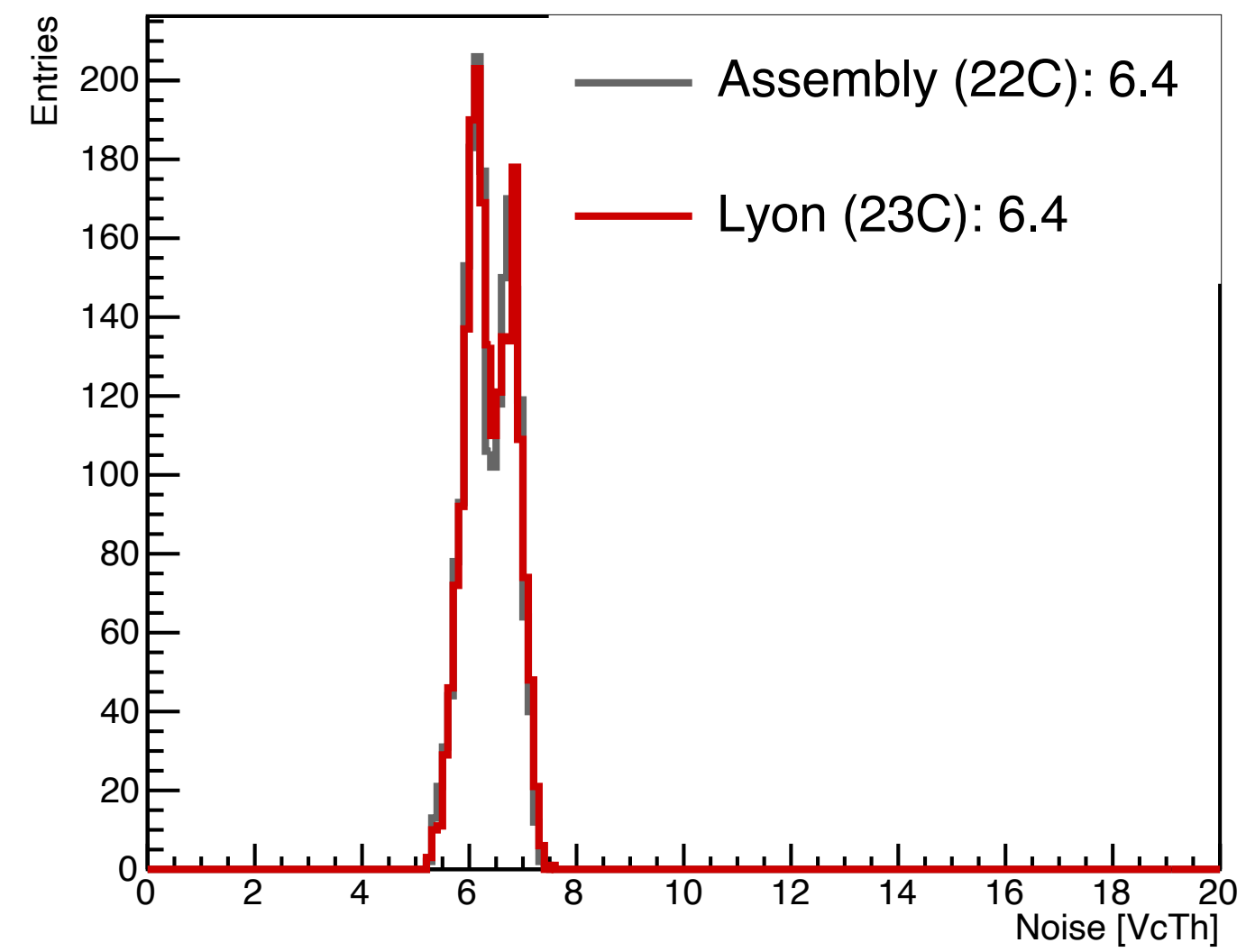


Comparison between Assembly and Integration site

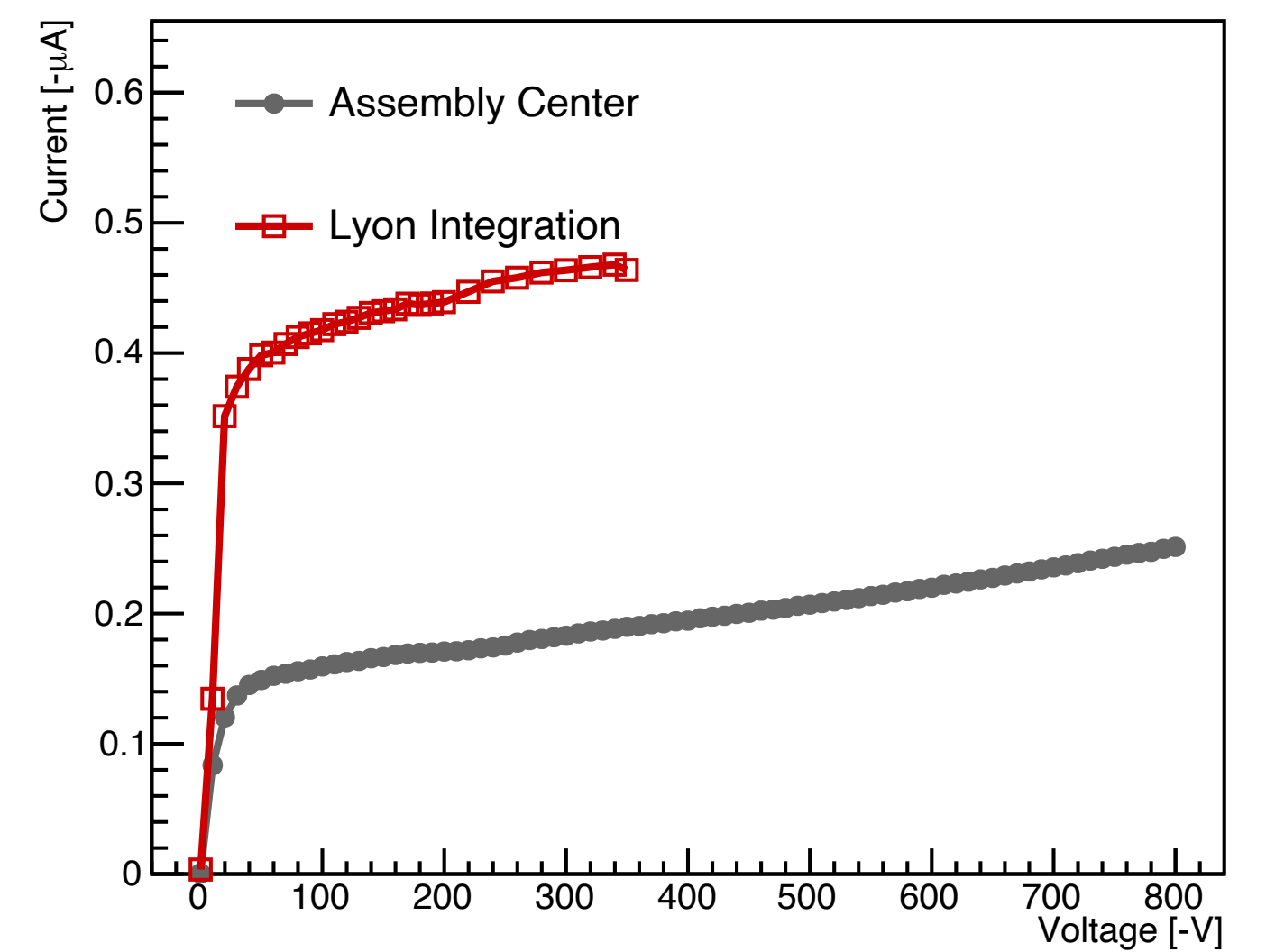
Strip Noise - Hybrid 0 (2S_40_6_KIT-10023)



Strip Noise - Hybrid 1 (2S_40_6_KIT-10023)

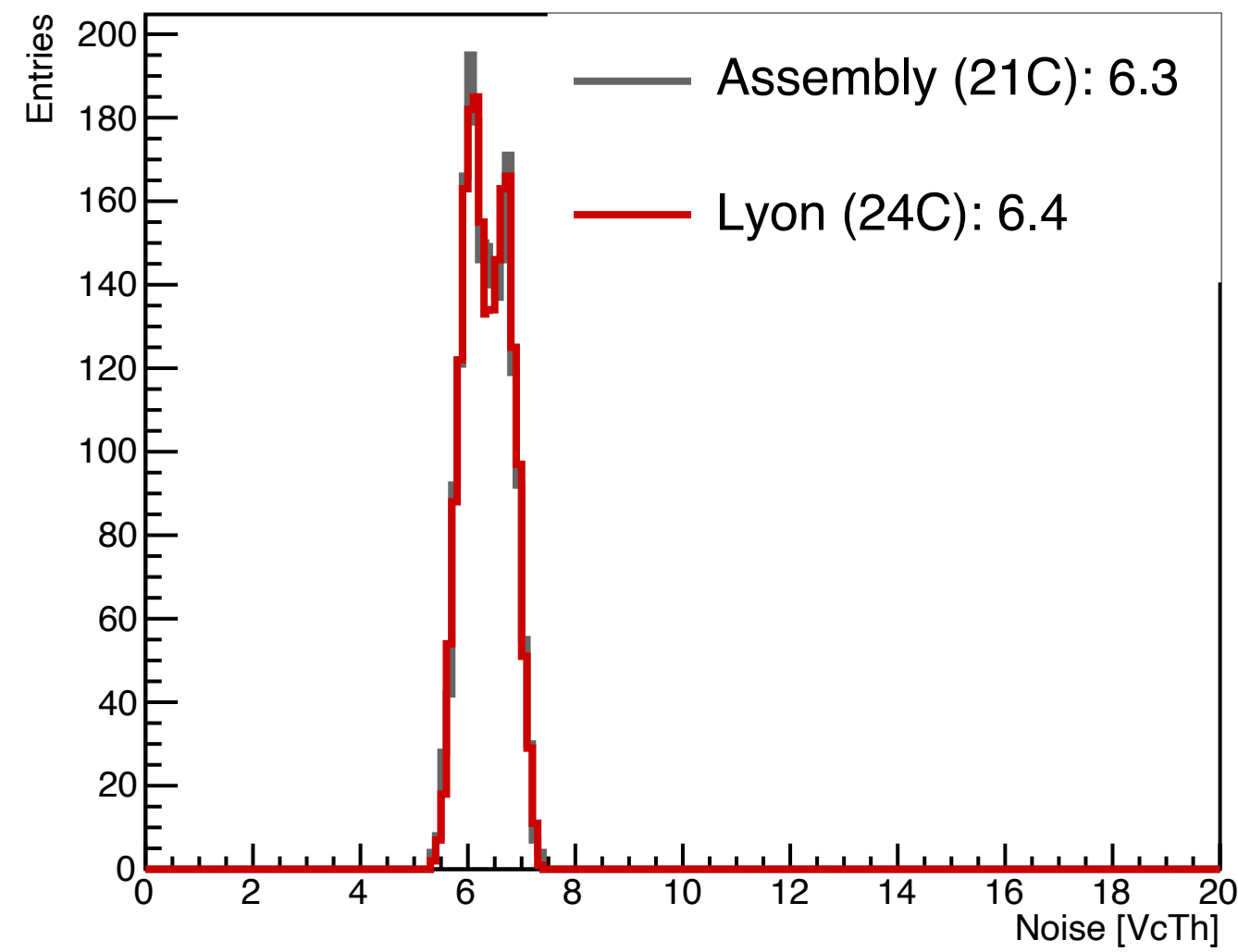


Leakage Current Comparison

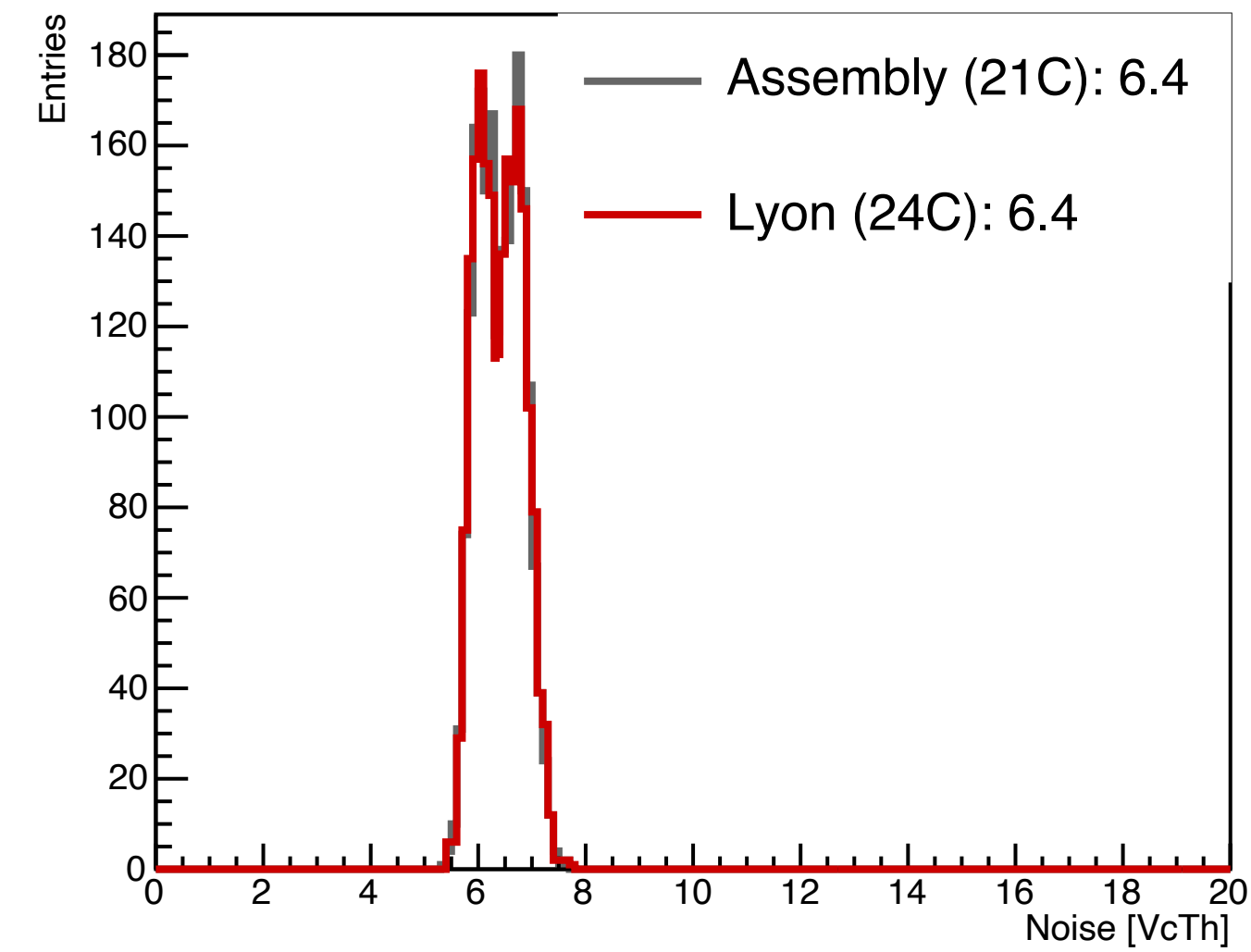


Comparison between Assembly and Integration site

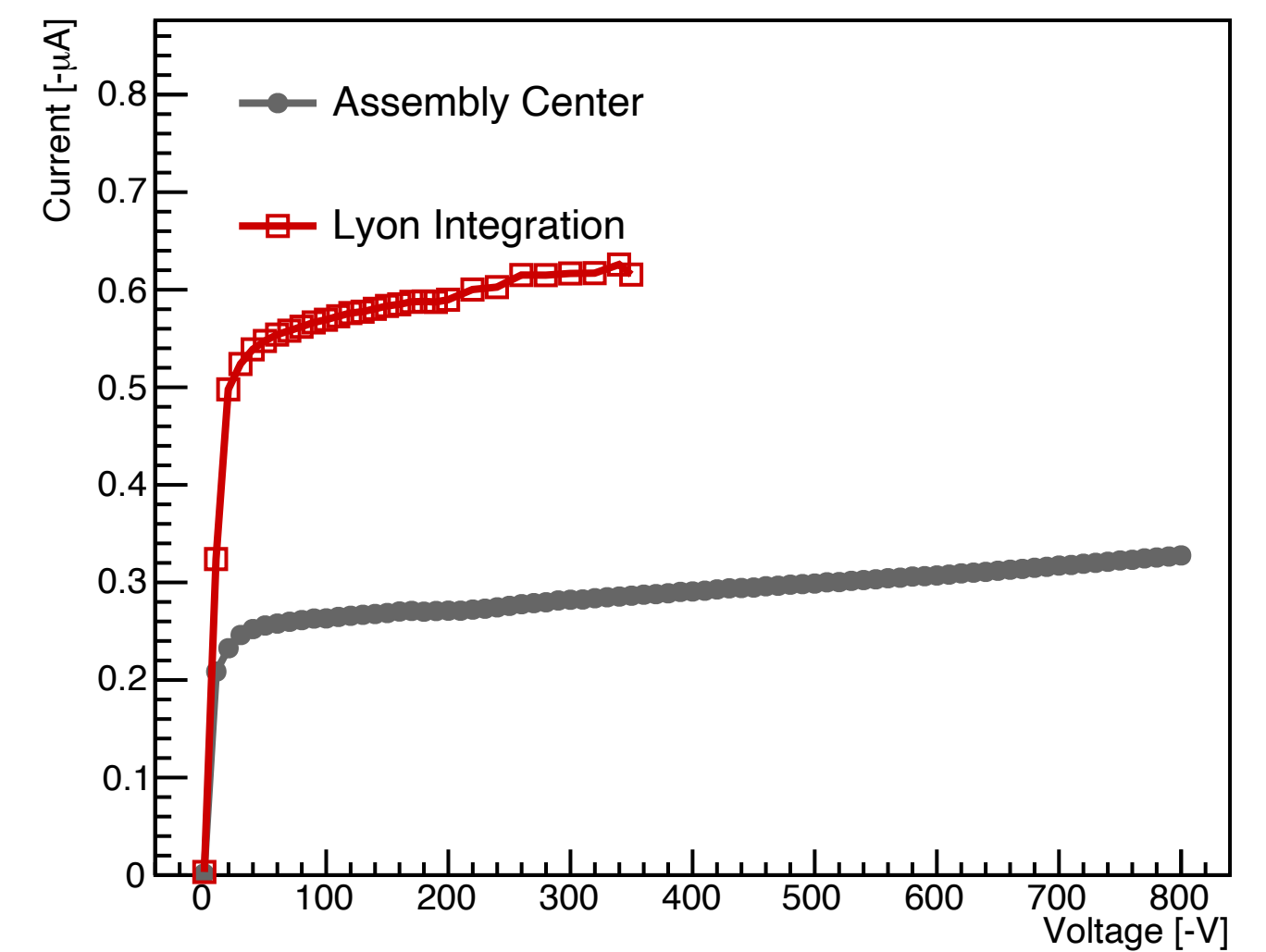
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Strip Noise - Hybrid 1 (2S_40_6_KIT-10024)

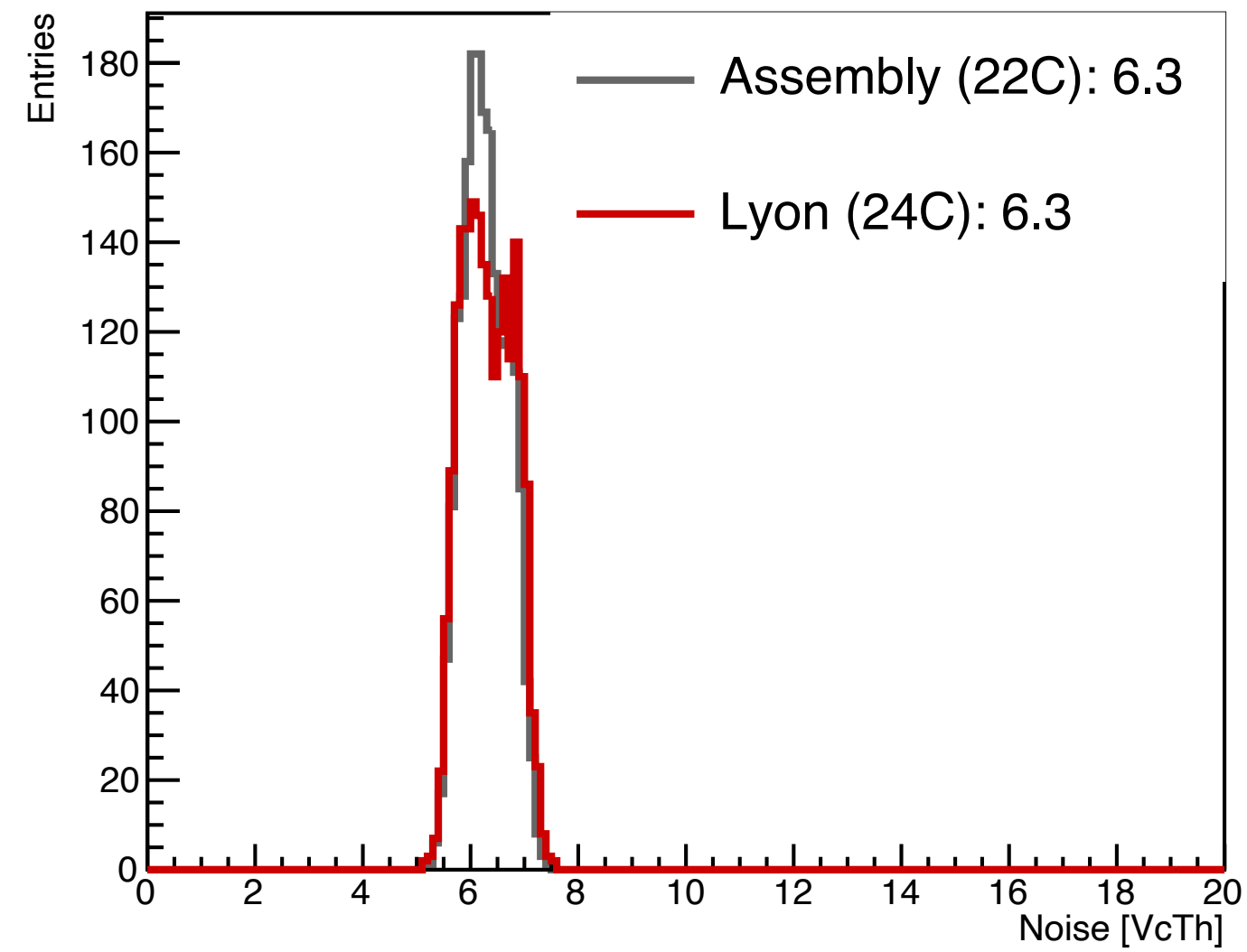


Leakage Current Comparison

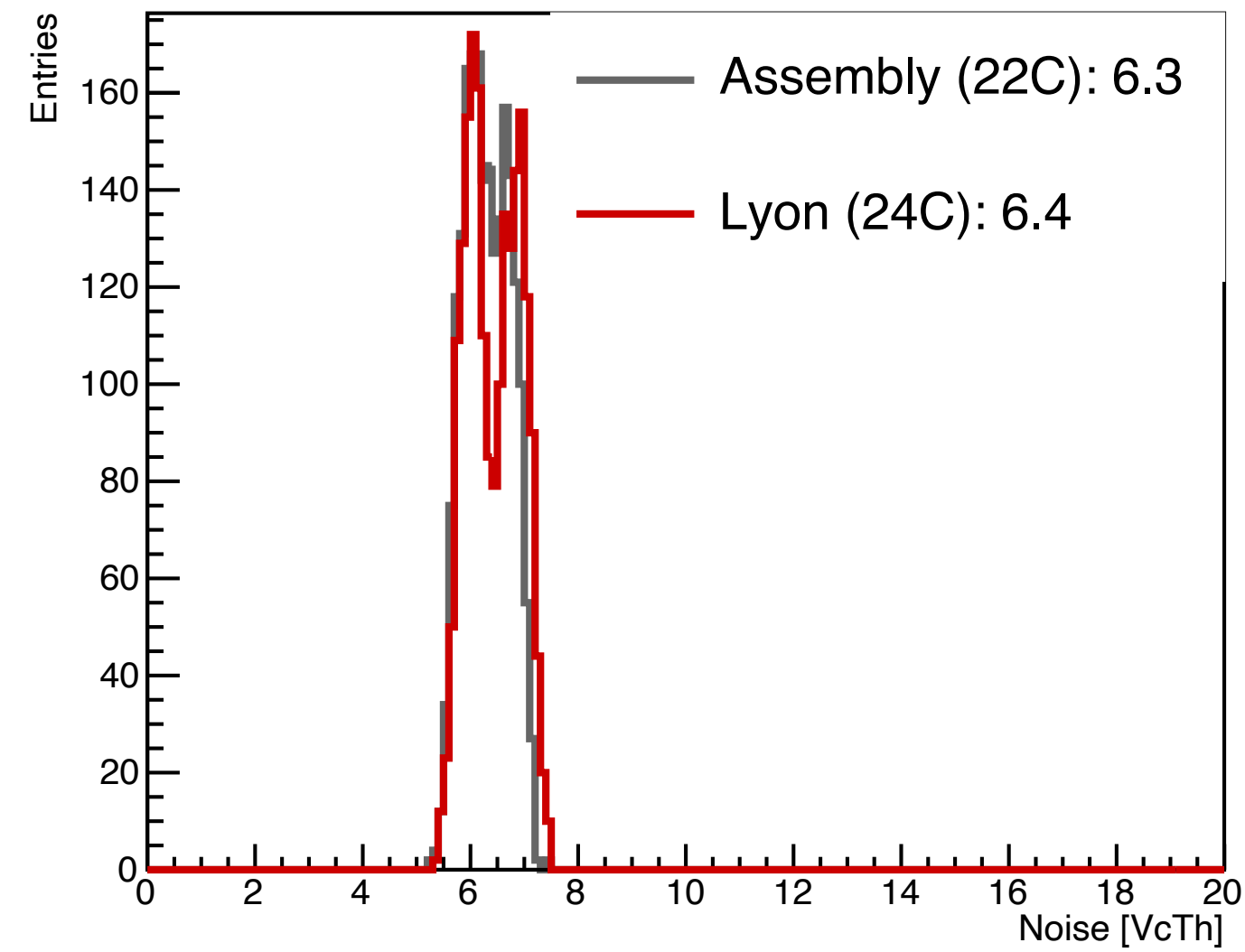


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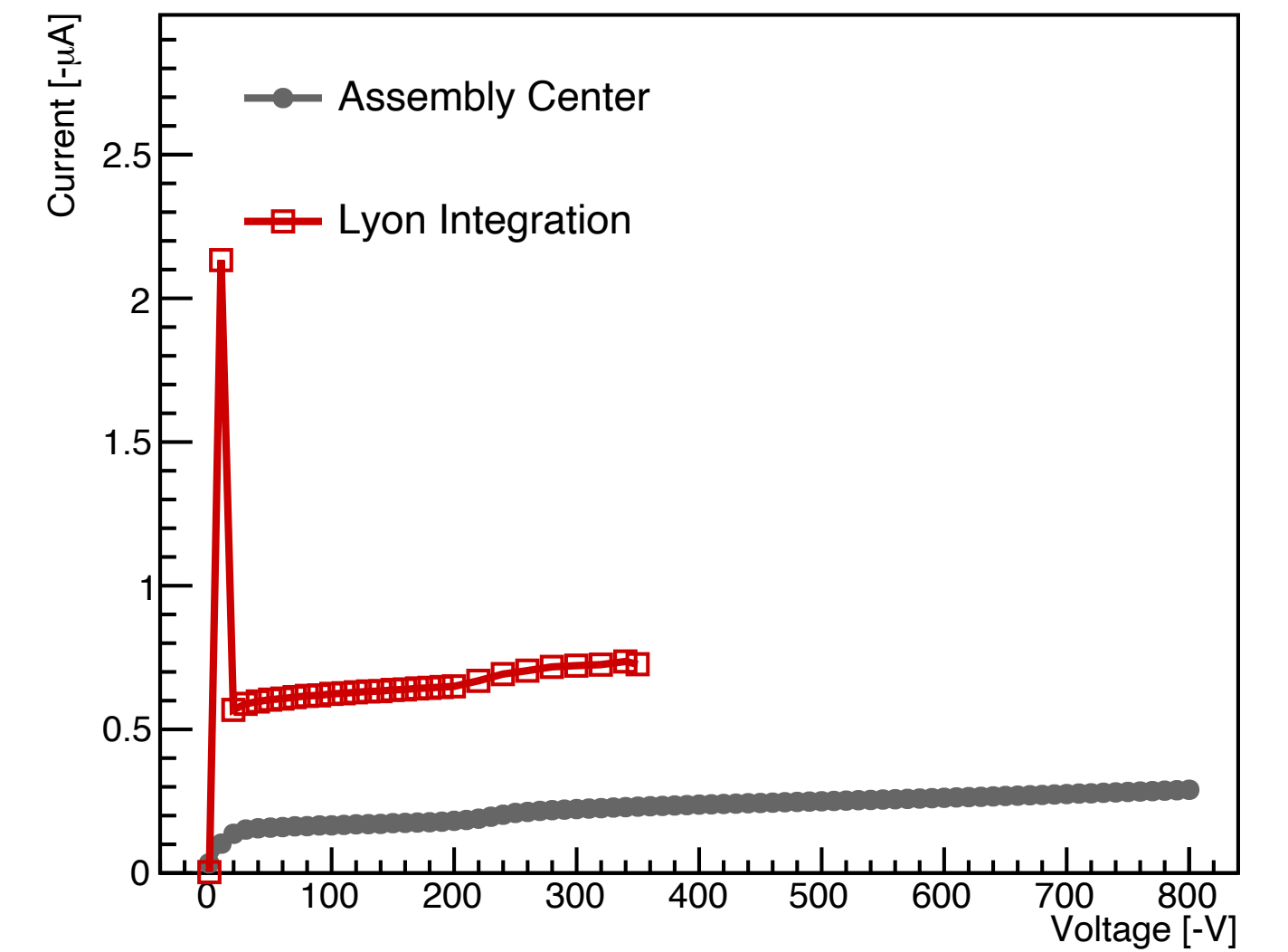
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Strip Noise - Hybrid 1 (2S_40_6_KIT-10025)

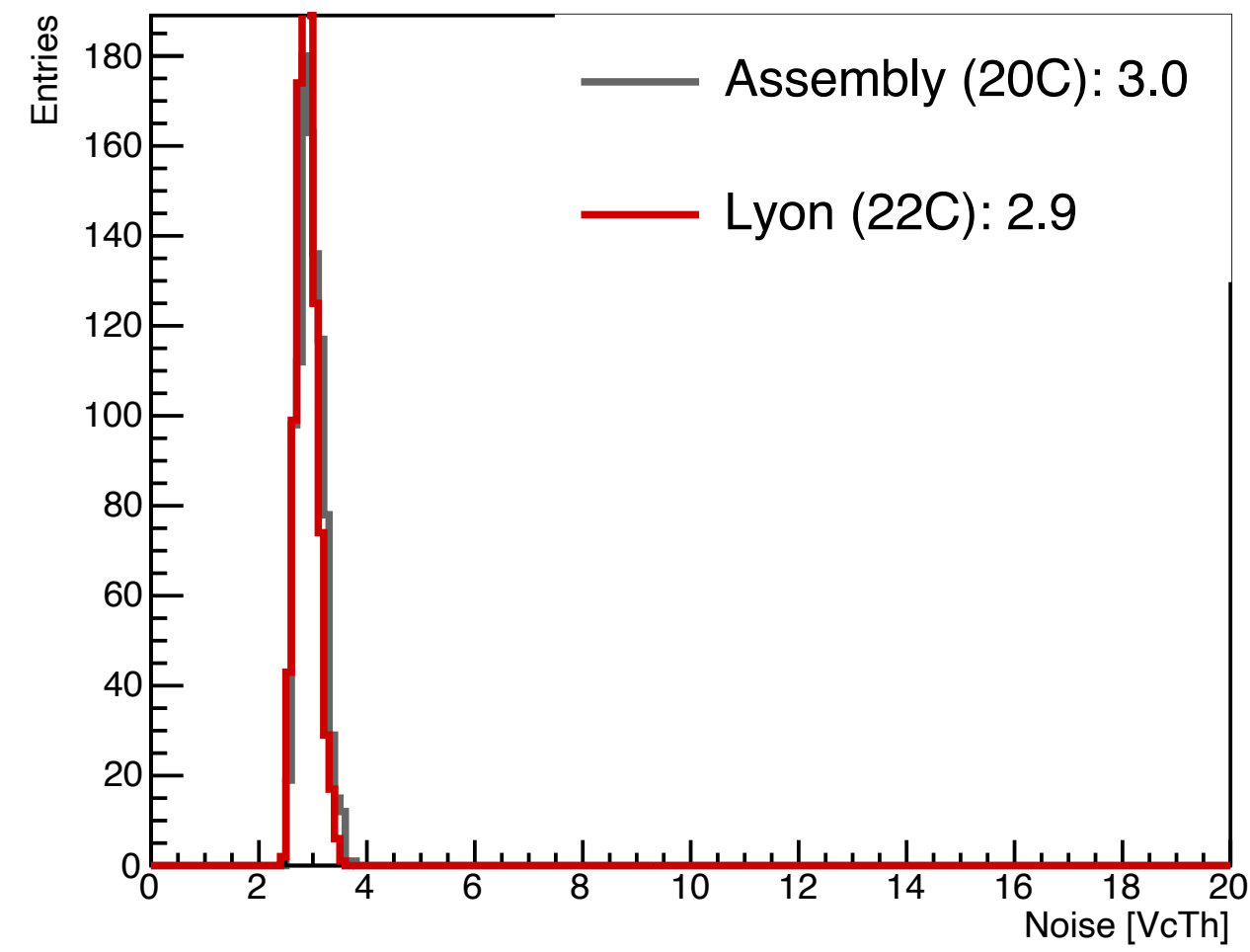


Leakage Current Comparison

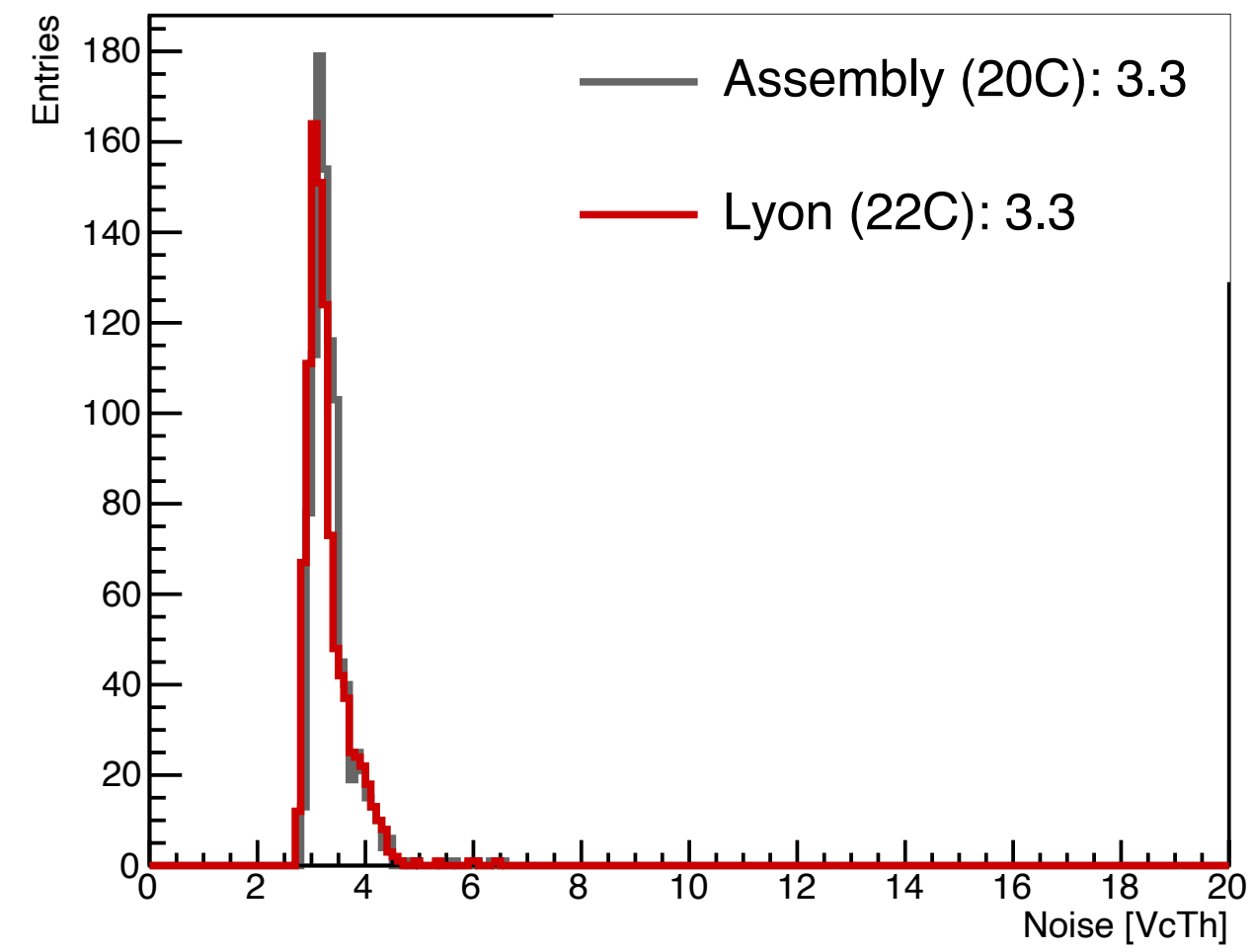


Comparison between Assembly and Integration site

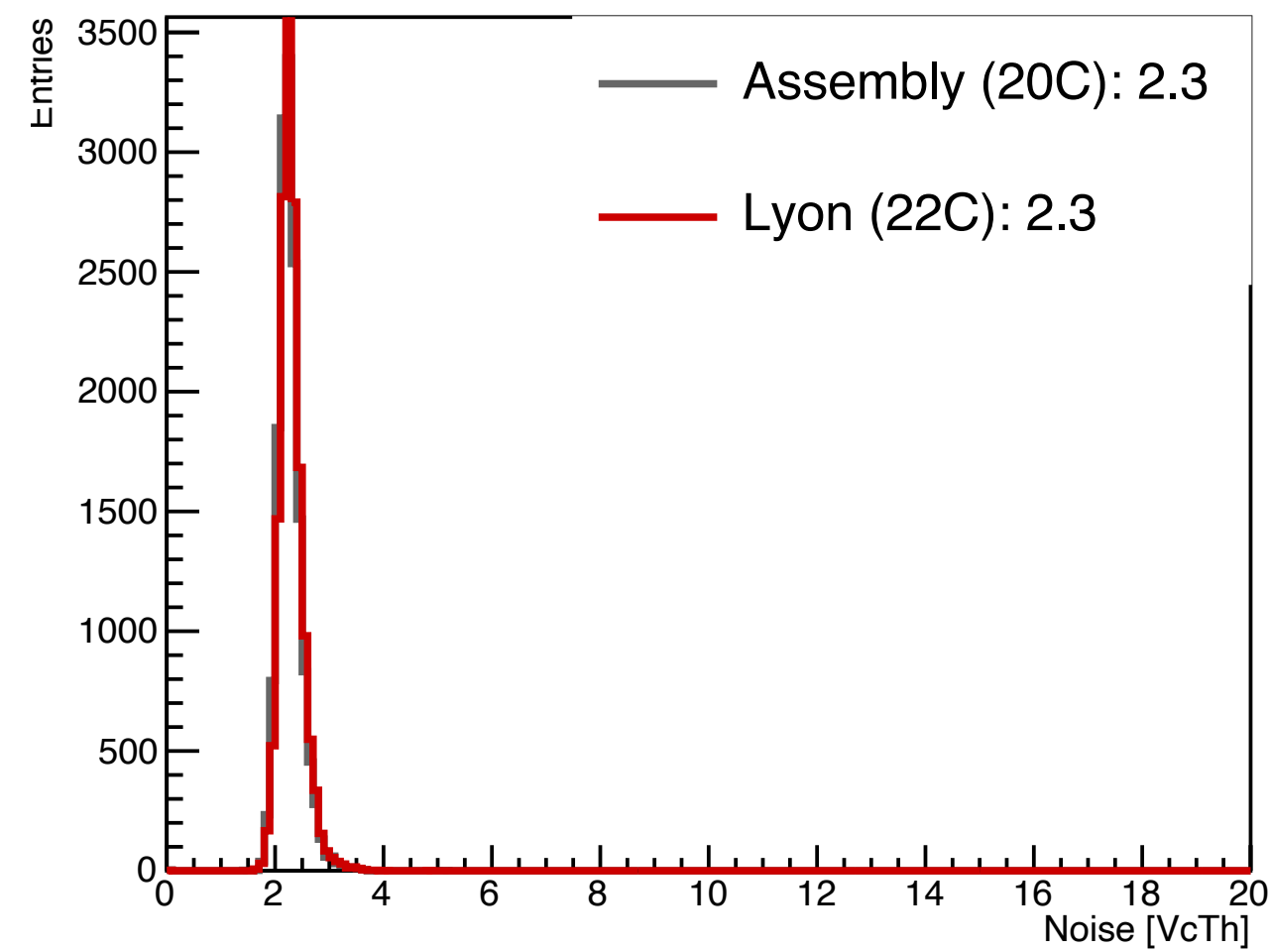
Strip Noise - Hybrid 0 (PS_40_IPG-10008)



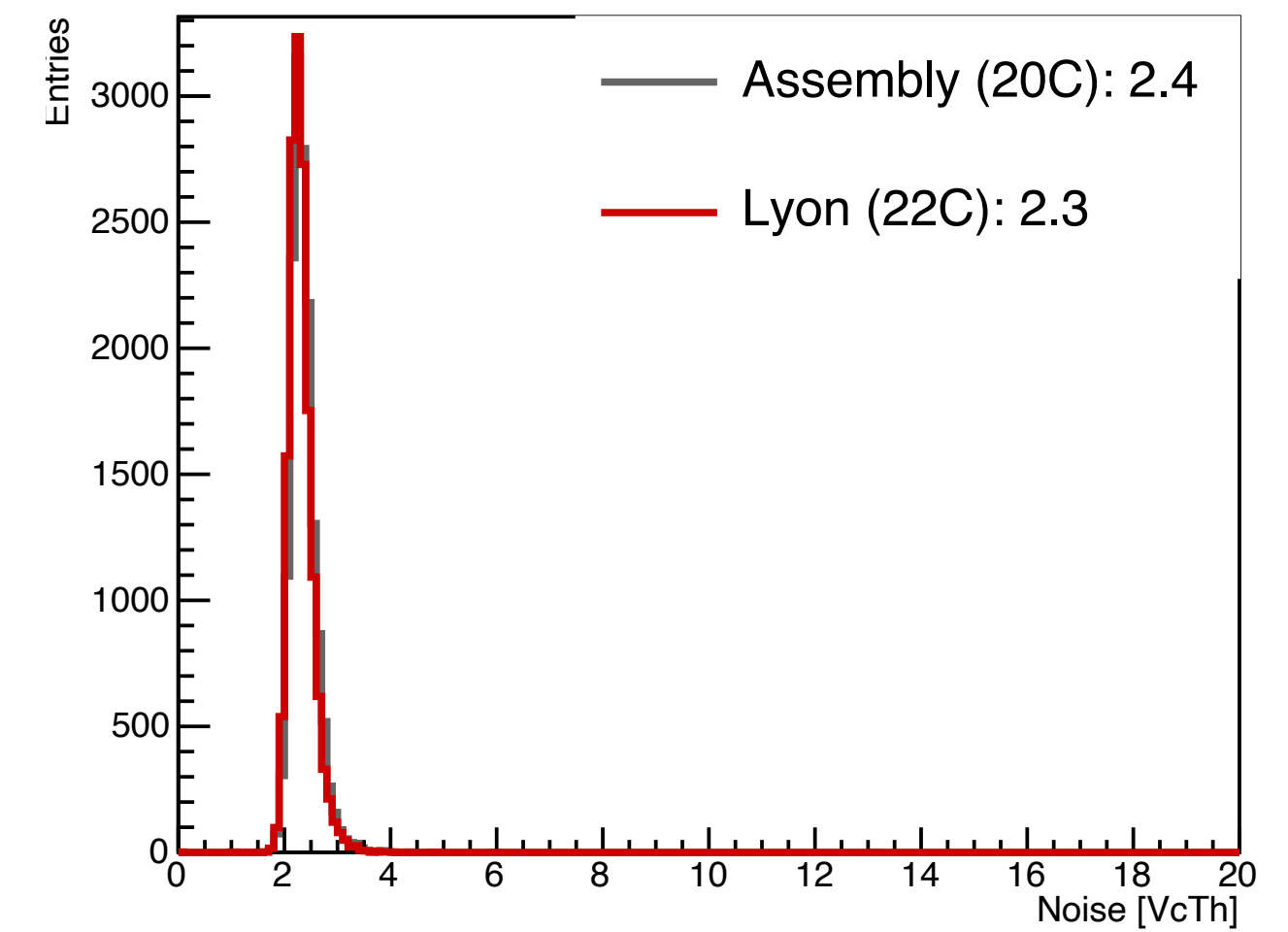
Strip Noise - Hybrid 1 (PS_40_IPG-10008)



Pixel Noise - Hybrid 0 (PS_40_IPG-10008)

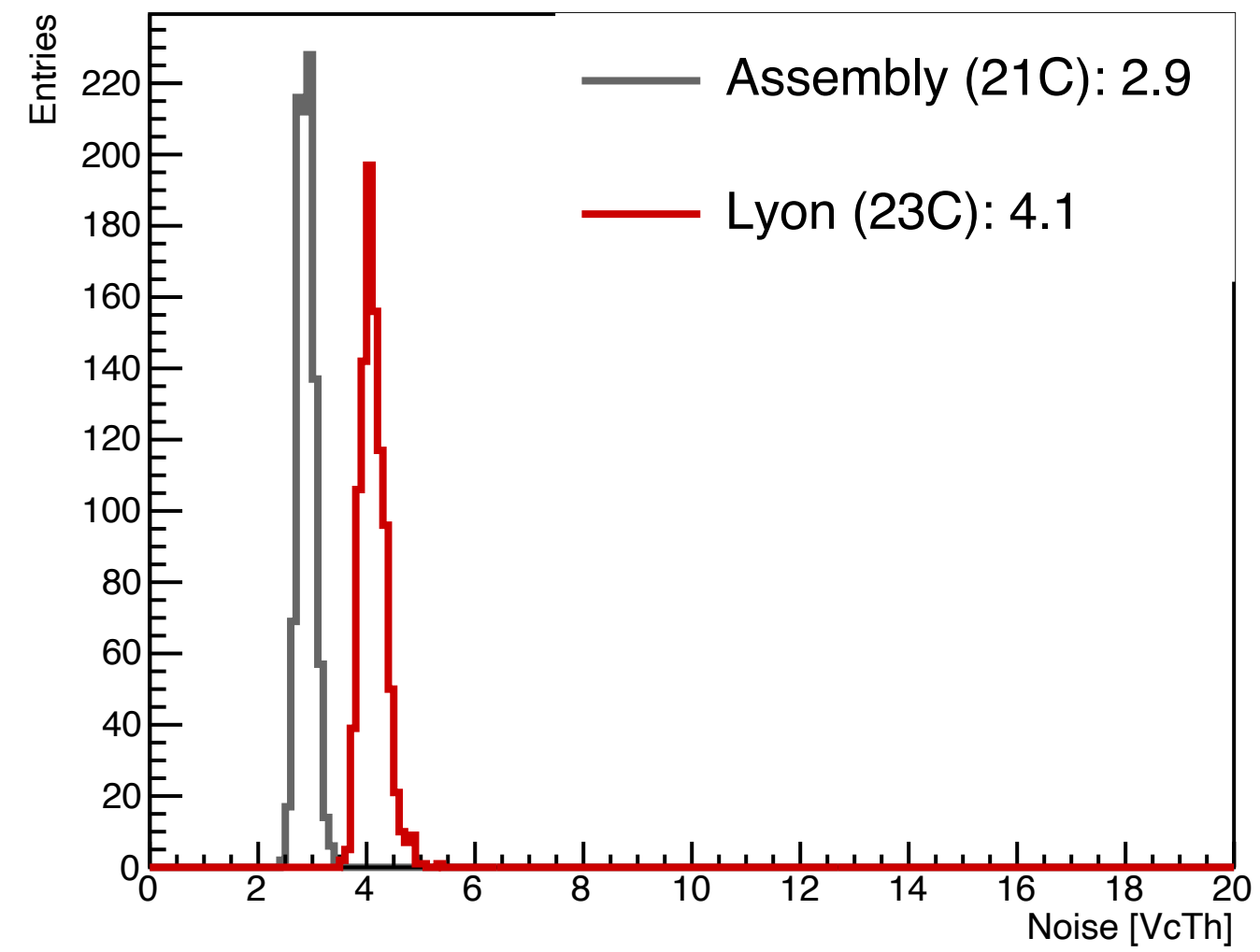


Pixel Noise - Hybrid 1 (PS_40_IPG-10008)

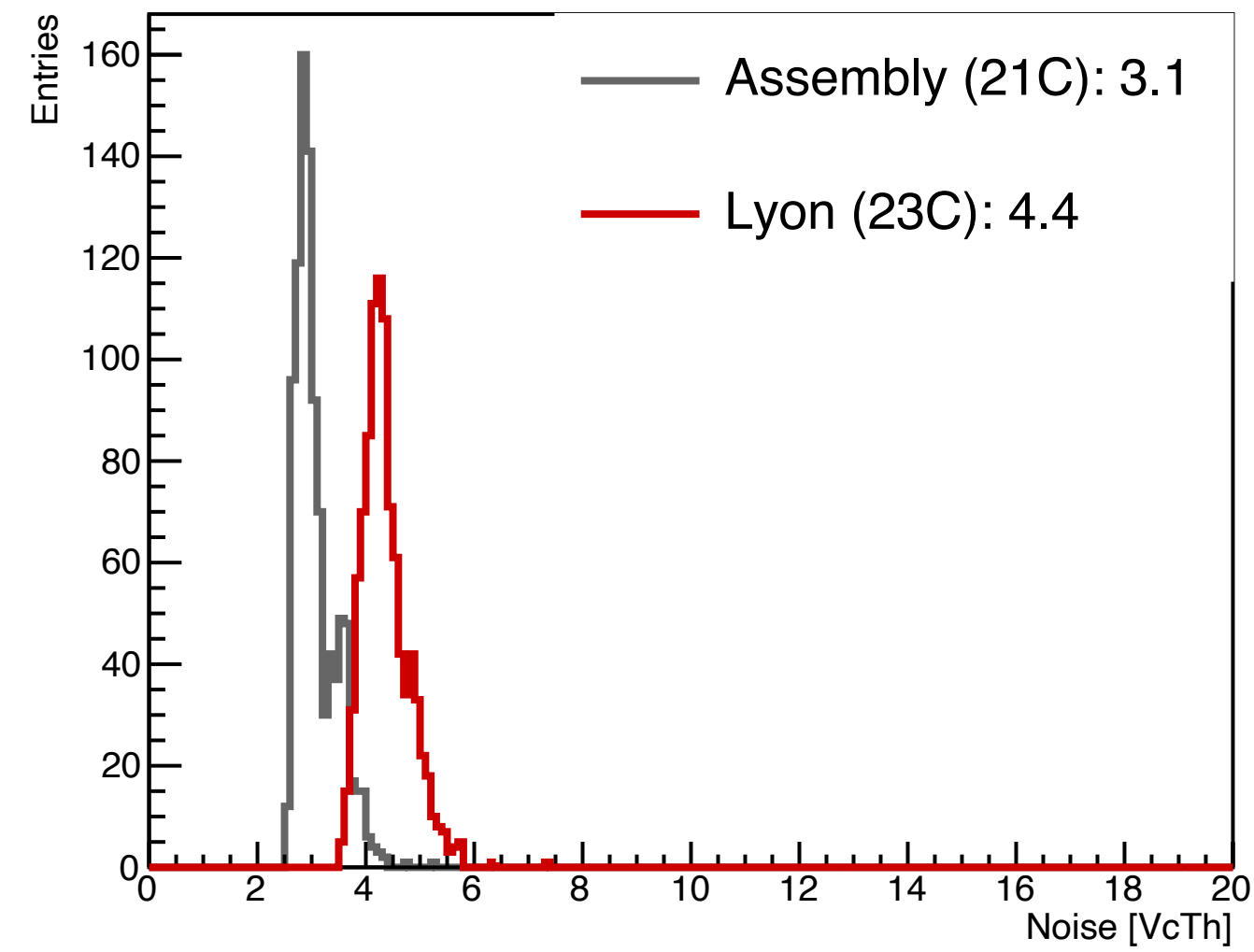


Comparison between Assembly and Integration site

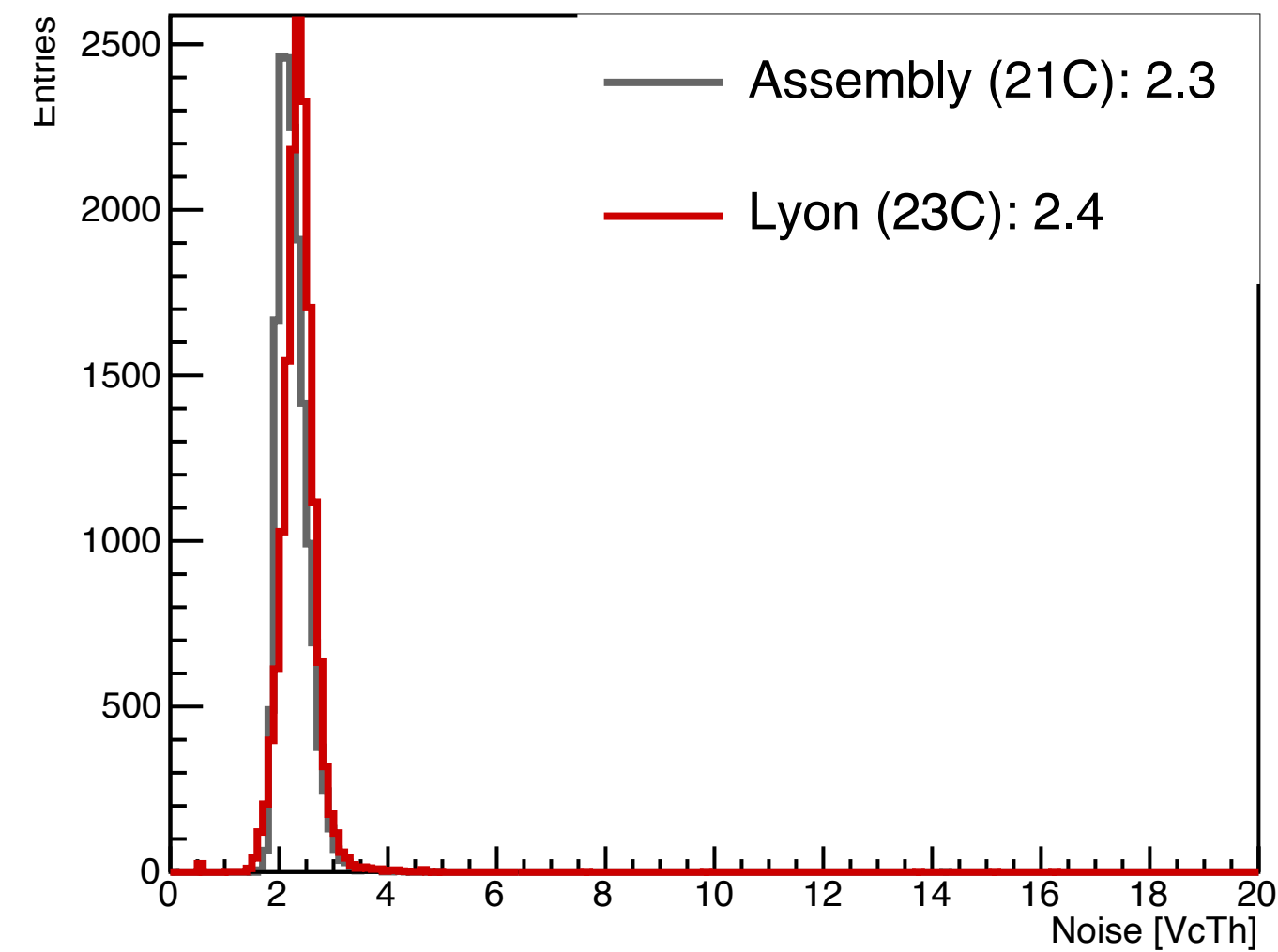
Strip Noise - Hybrid 0 (PS_40_IPG-10014)



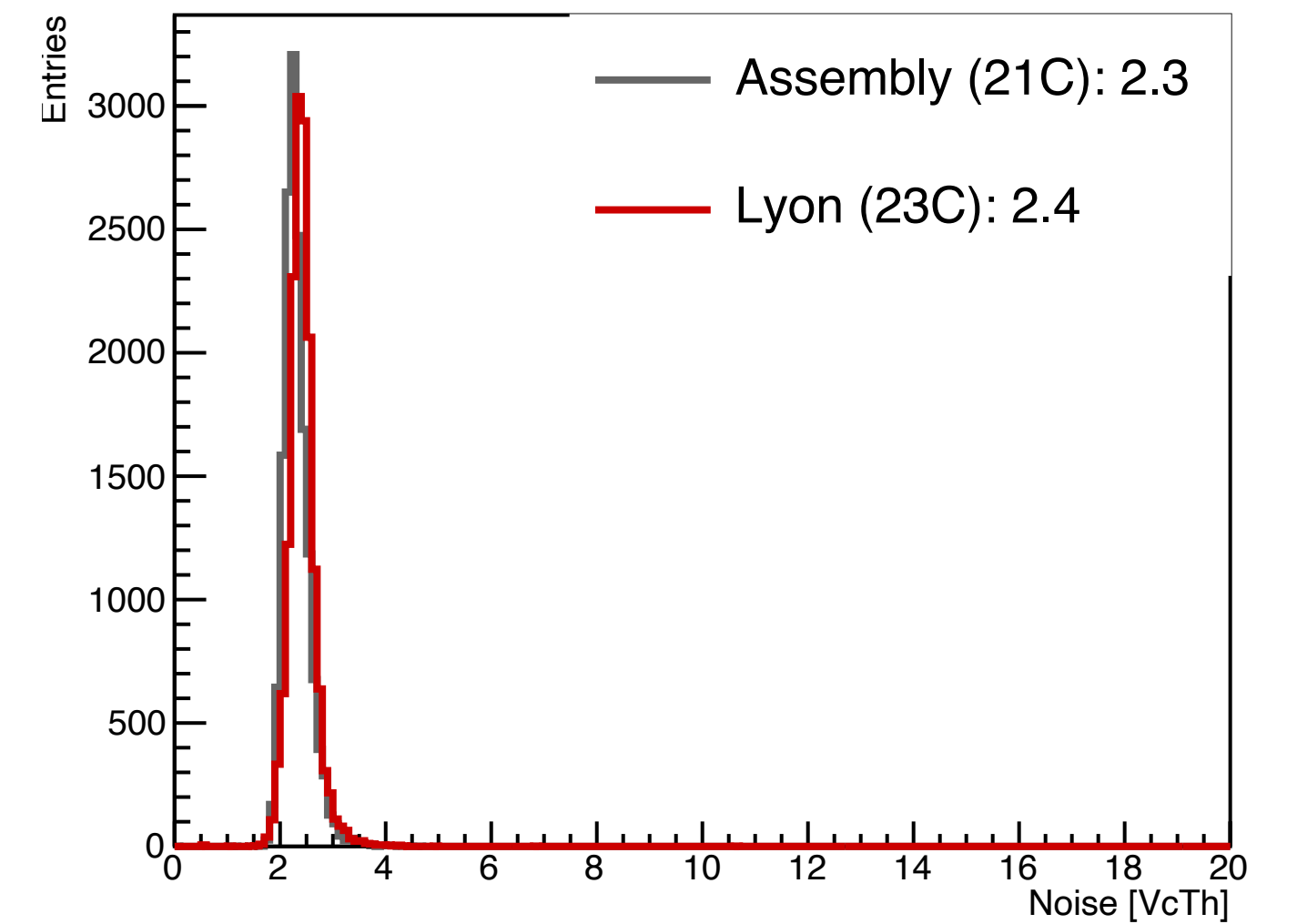
Strip Noise - Hybrid 1 (PS_40_IPG-10014)



Pixel Noise - Hybrid 0 (PS_40_IPG-10014)

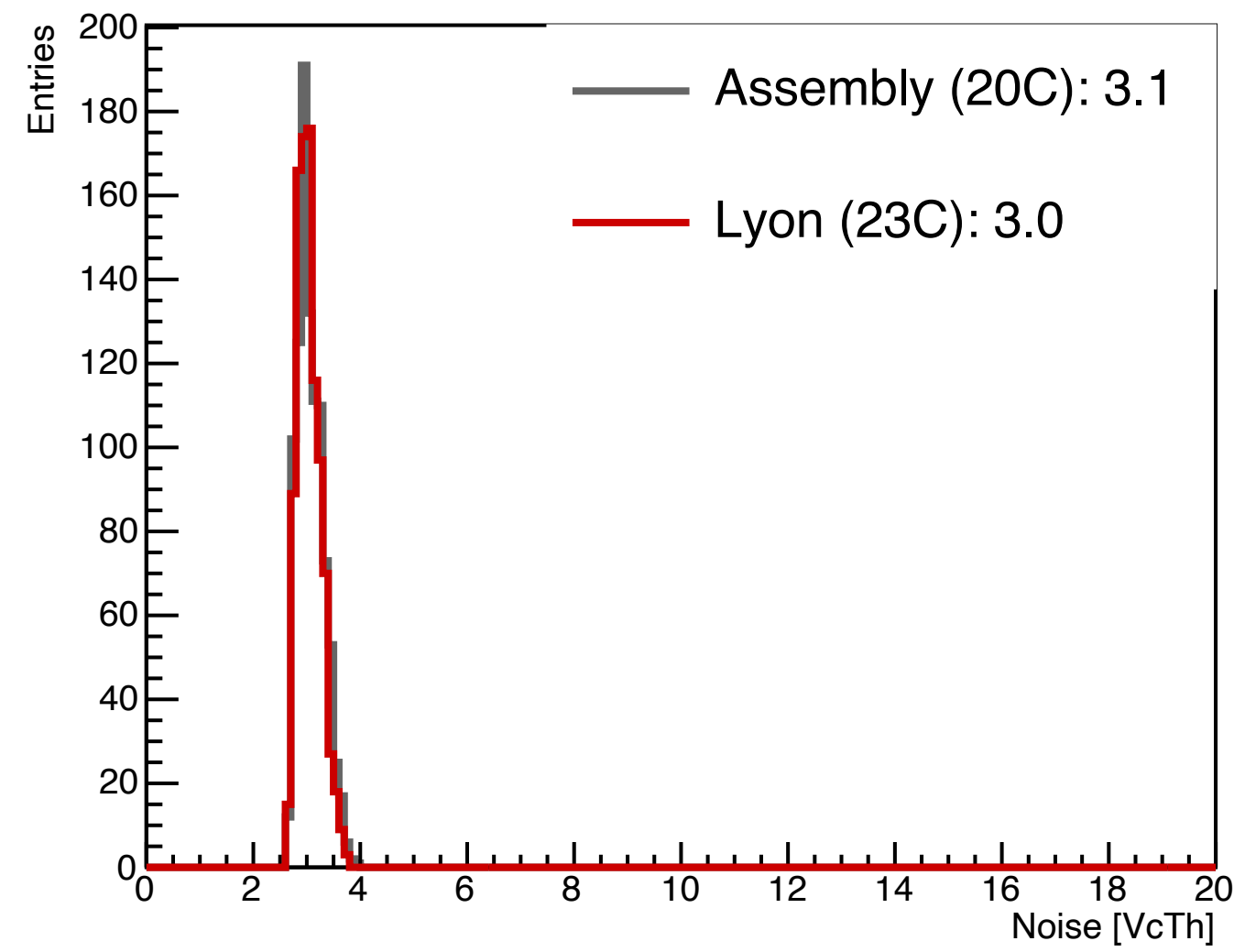


Pixel Noise - Hybrid 1 (PS_40_IPG-10014)

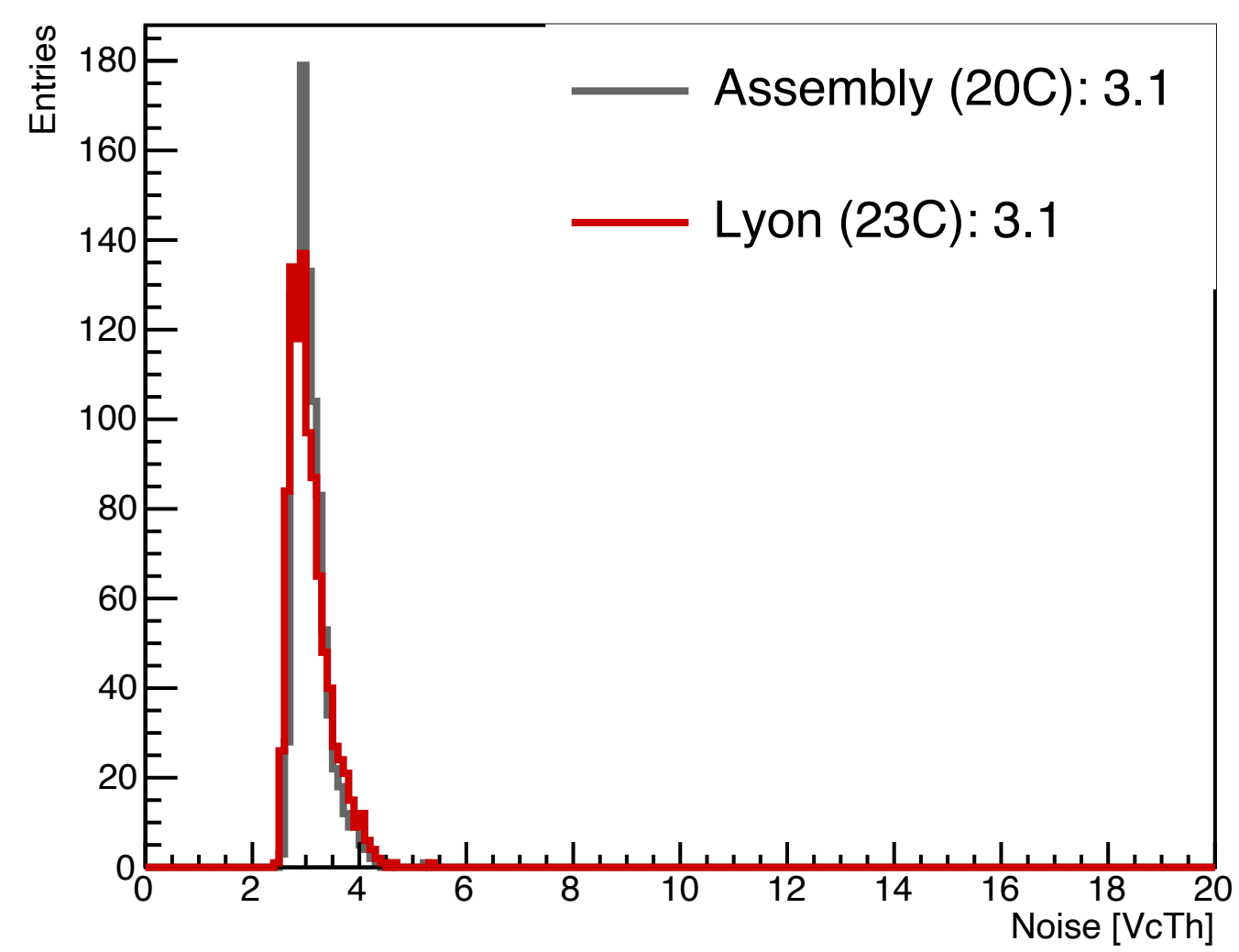


Comparison between Assembly and Integration site

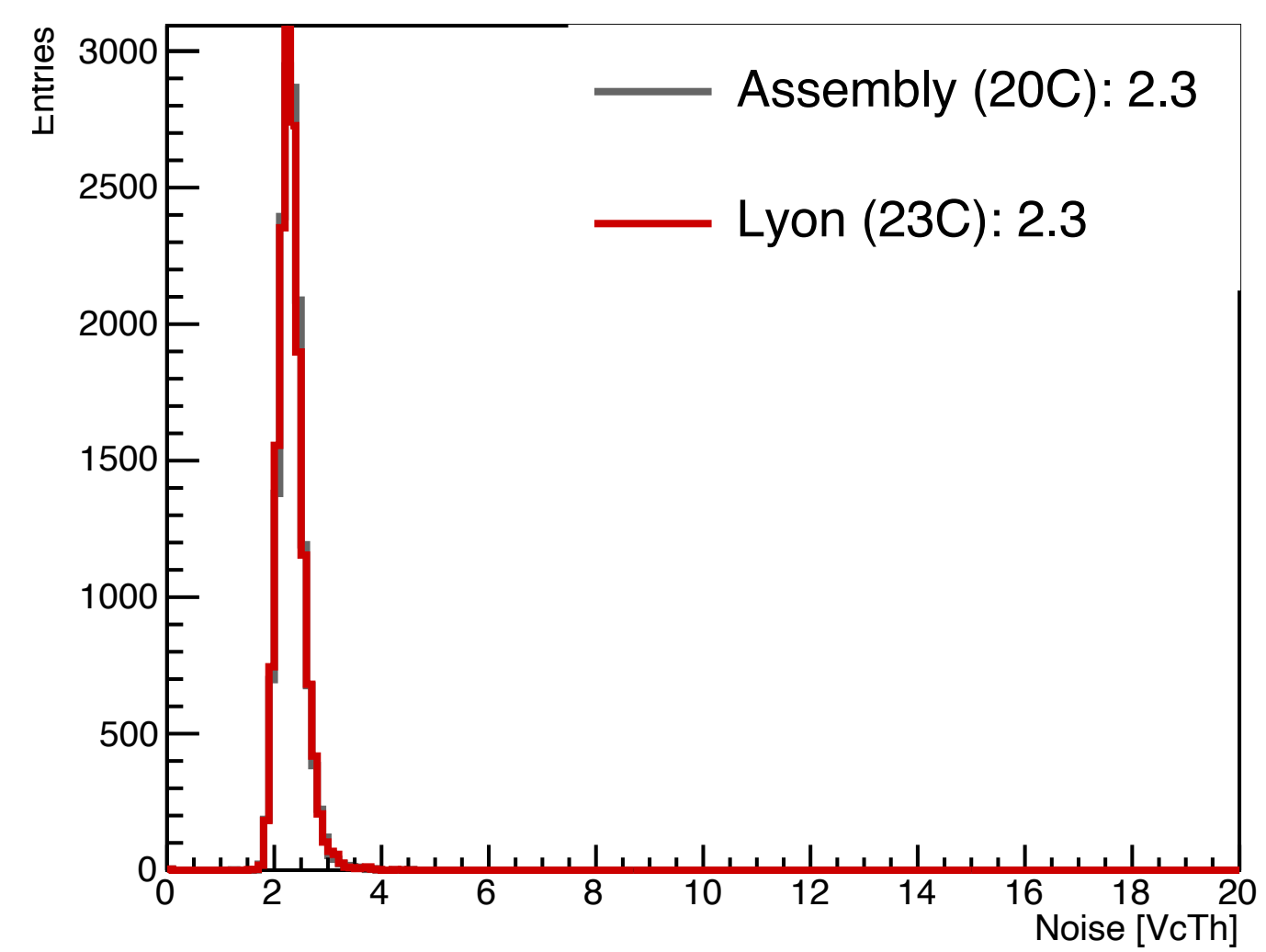
Strip Noise - Hybrid 0 (PS_40_IPG-10015)



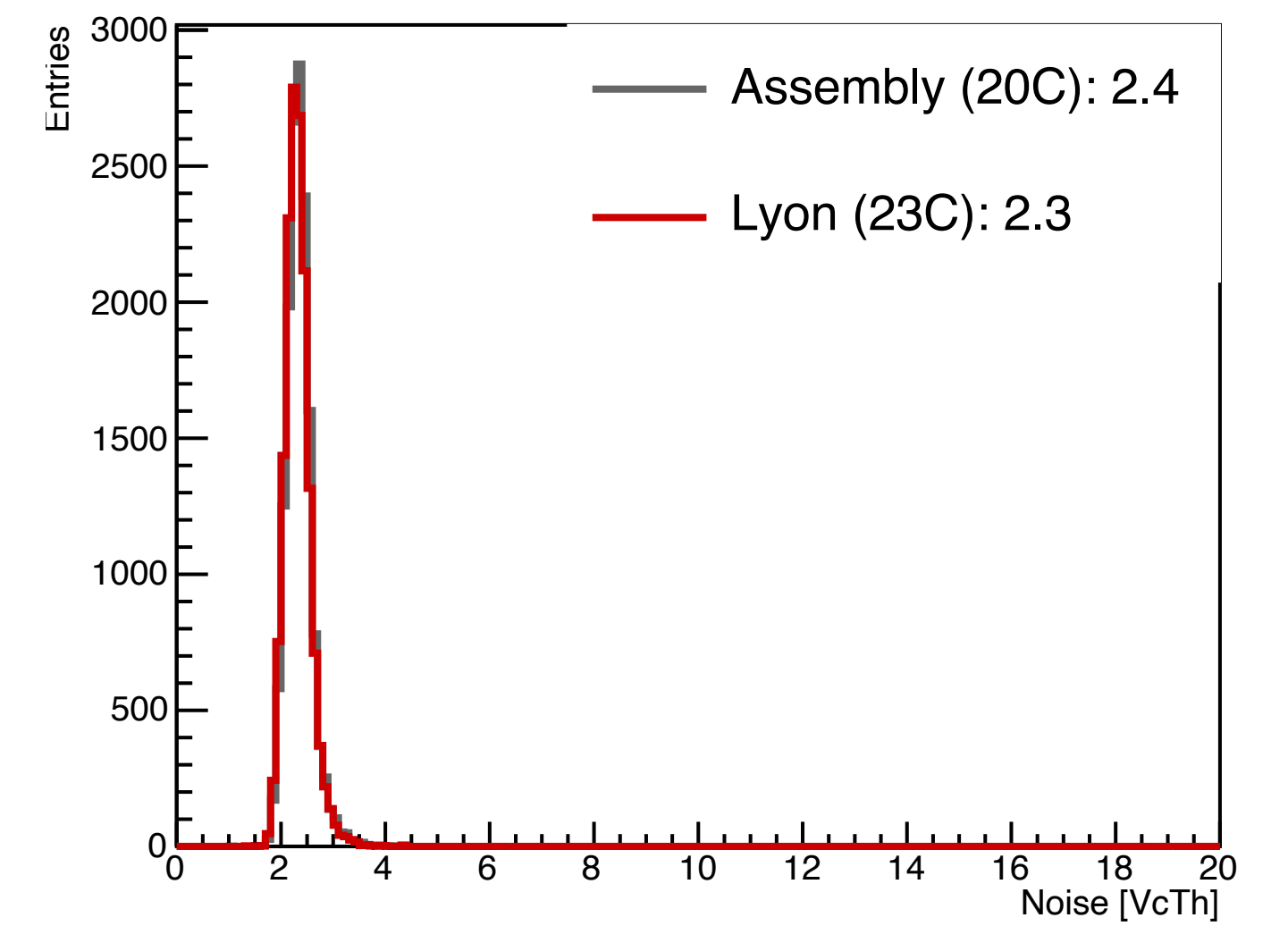
Strip Noise - Hybrid 1 (PS_40_IPG-10015)



Pixel Noise - Hybrid 0 (PS_40_IPG-10015)

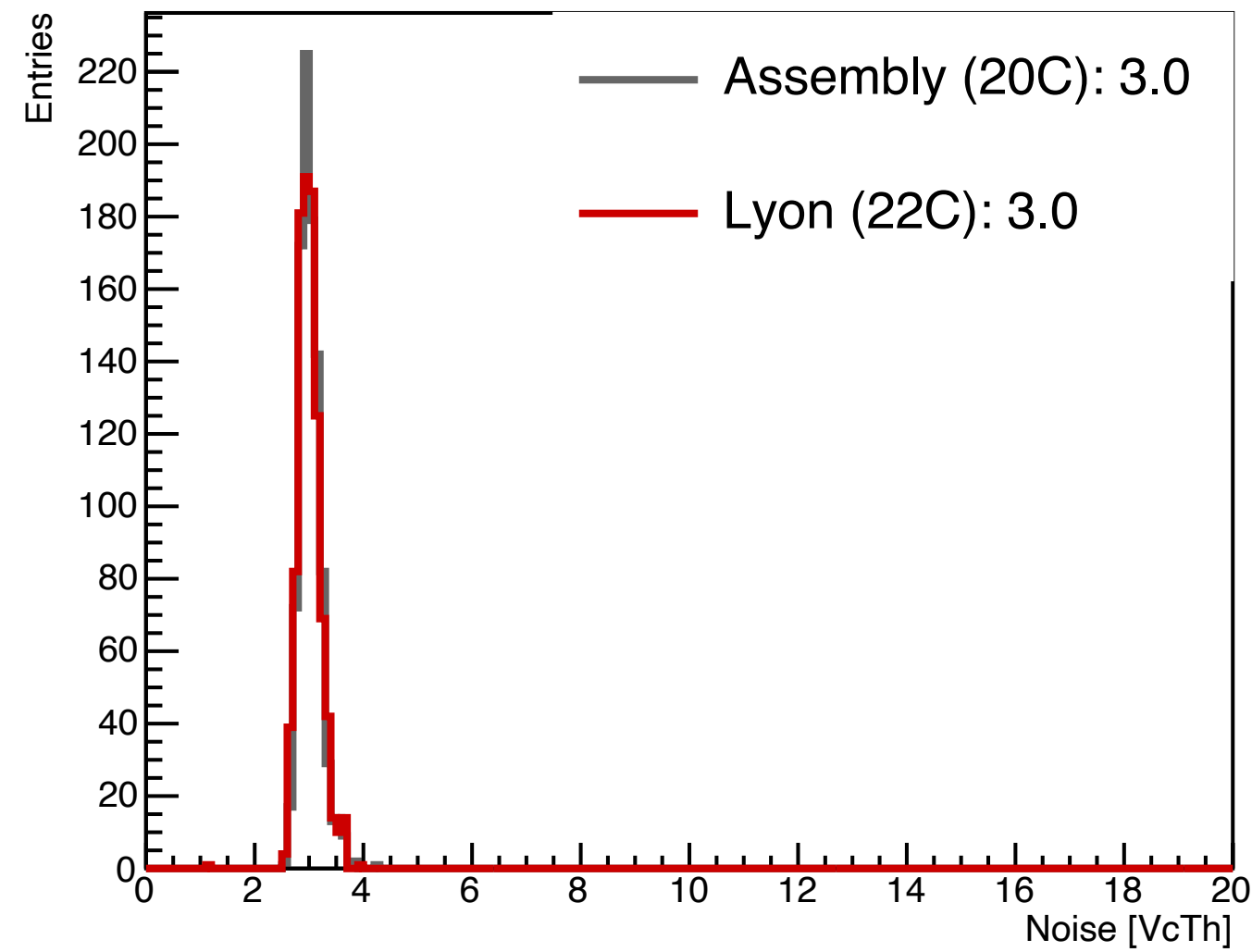


Pixel Noise - Hybrid 1 (PS_40_IPG-10015)

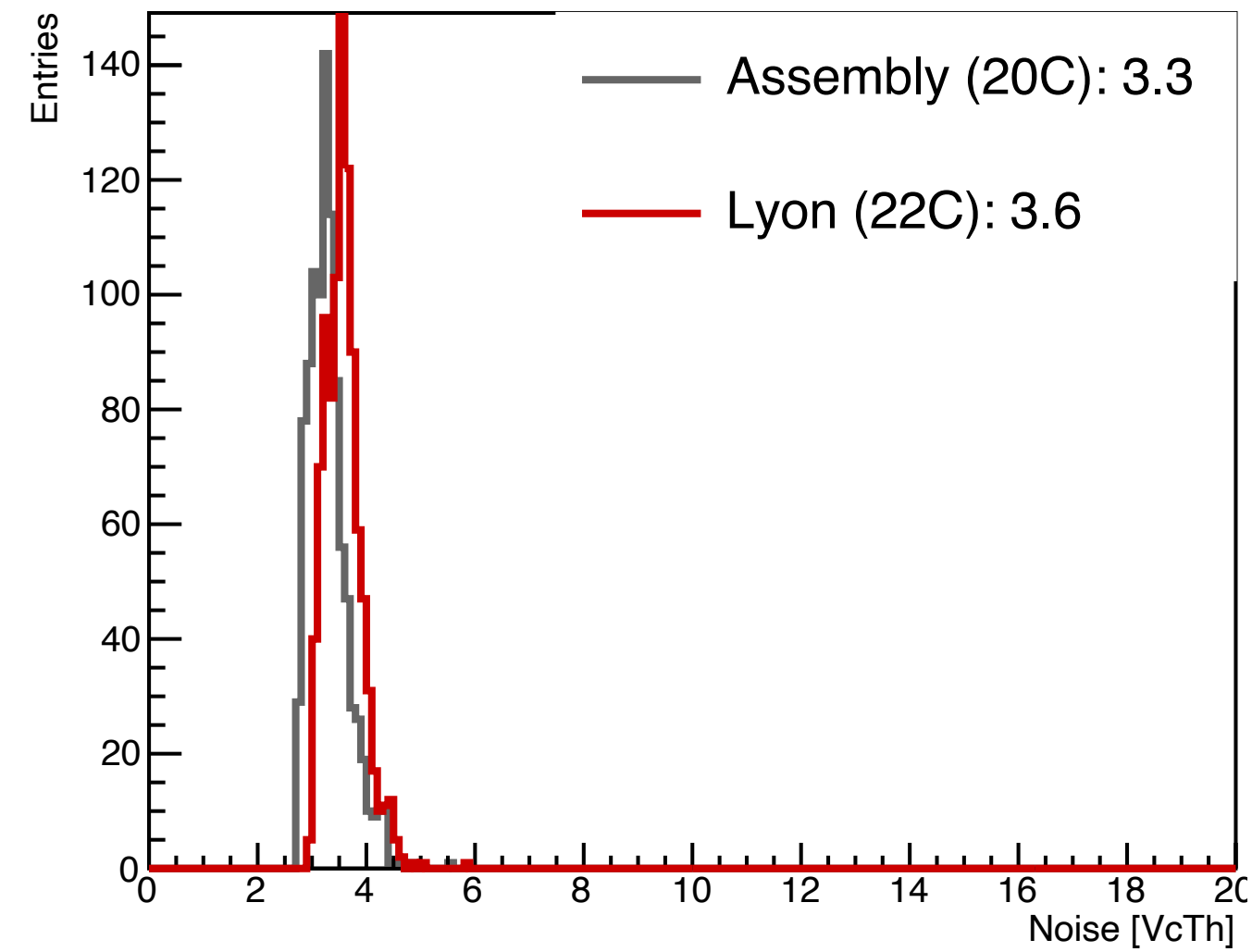


Comparison between Assembly and Integration site

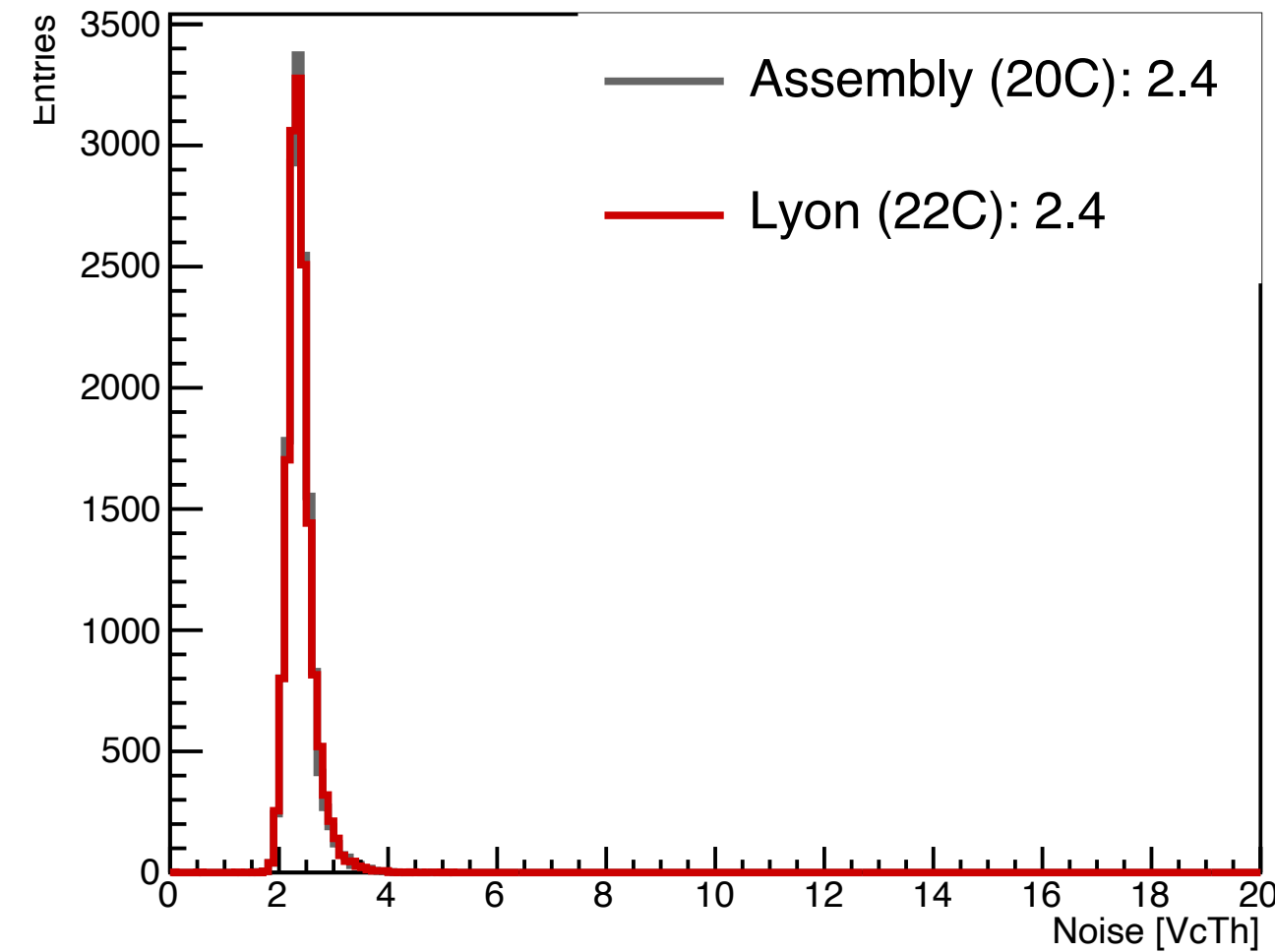
Strip Noise - Hybrid 0 (PS_40_IPG-10017)



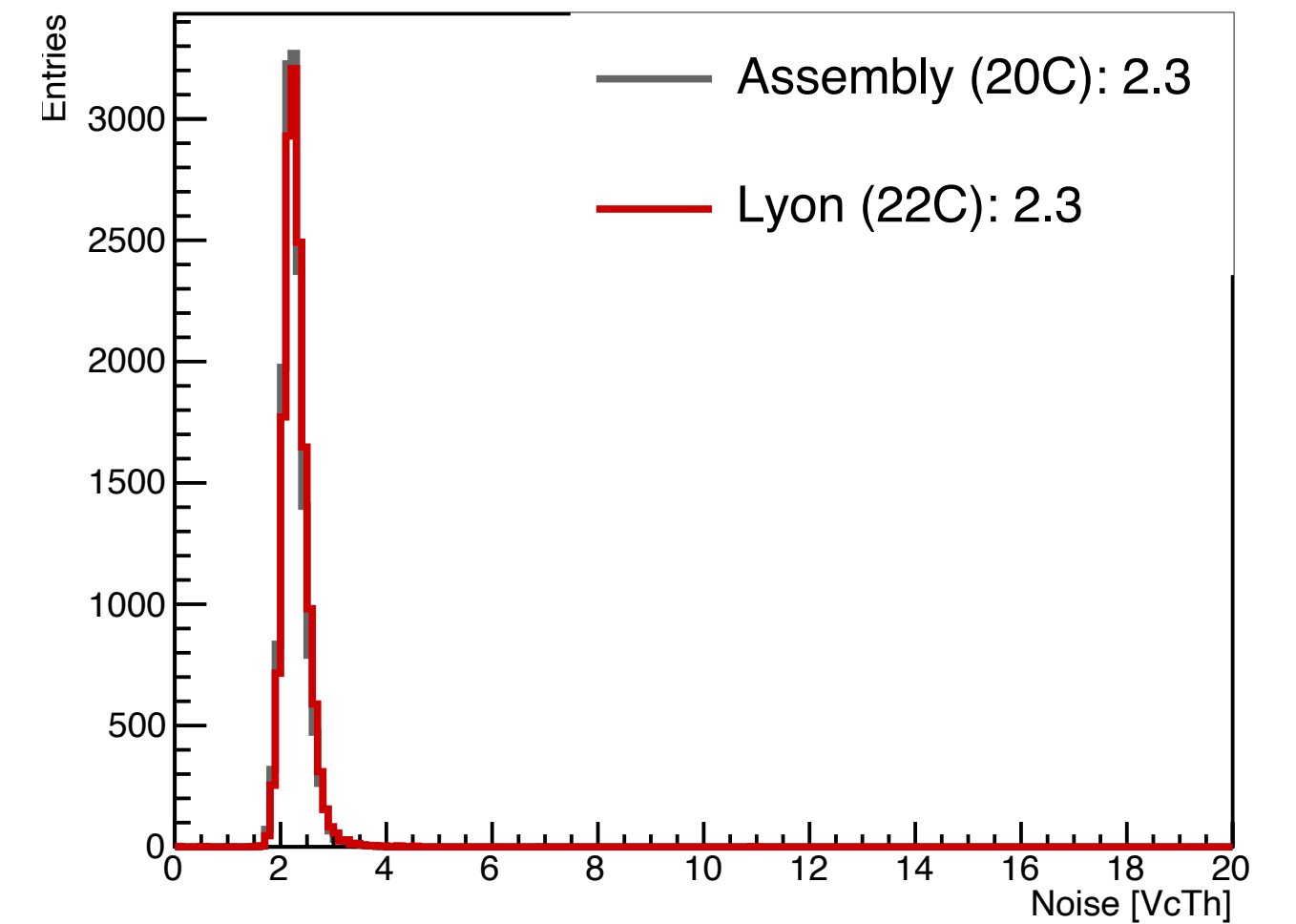
Strip Noise - Hybrid 1 (PS_40_IPG-10017)



Pixel Noise - Hybrid 0 (PS_40_IPG-10017)

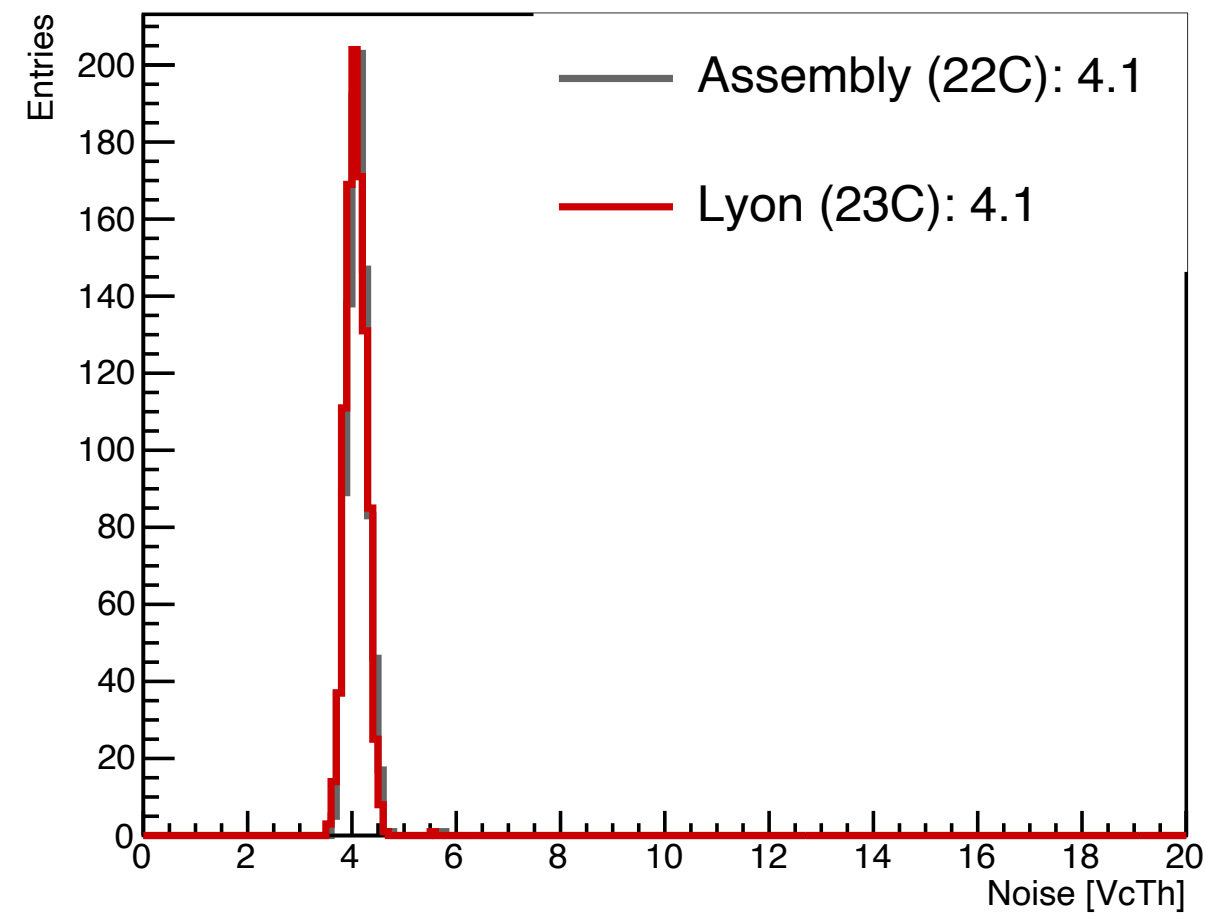


Pixel Noise - Hybrid 1 (PS_40_IPG-10017)

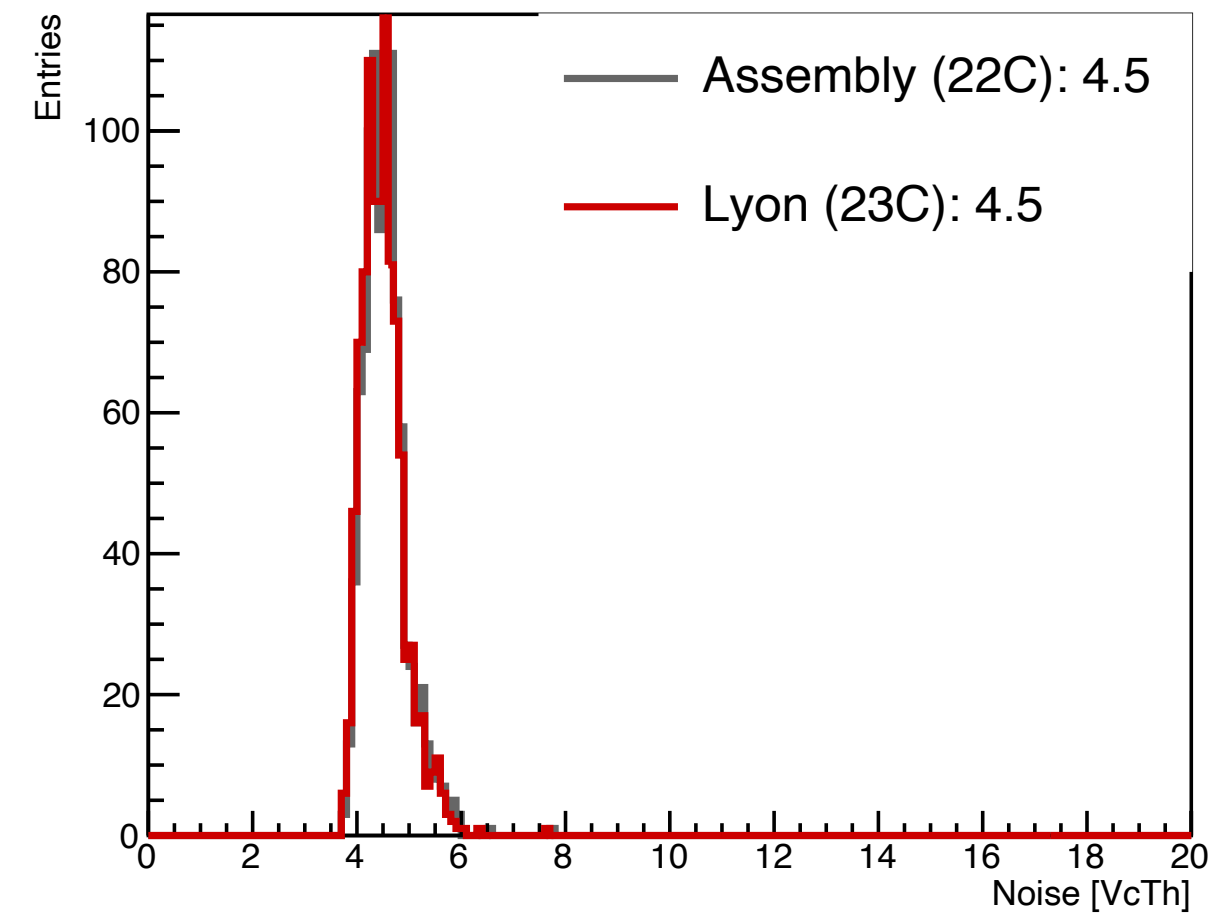


Comparison between Assembly and Integration site

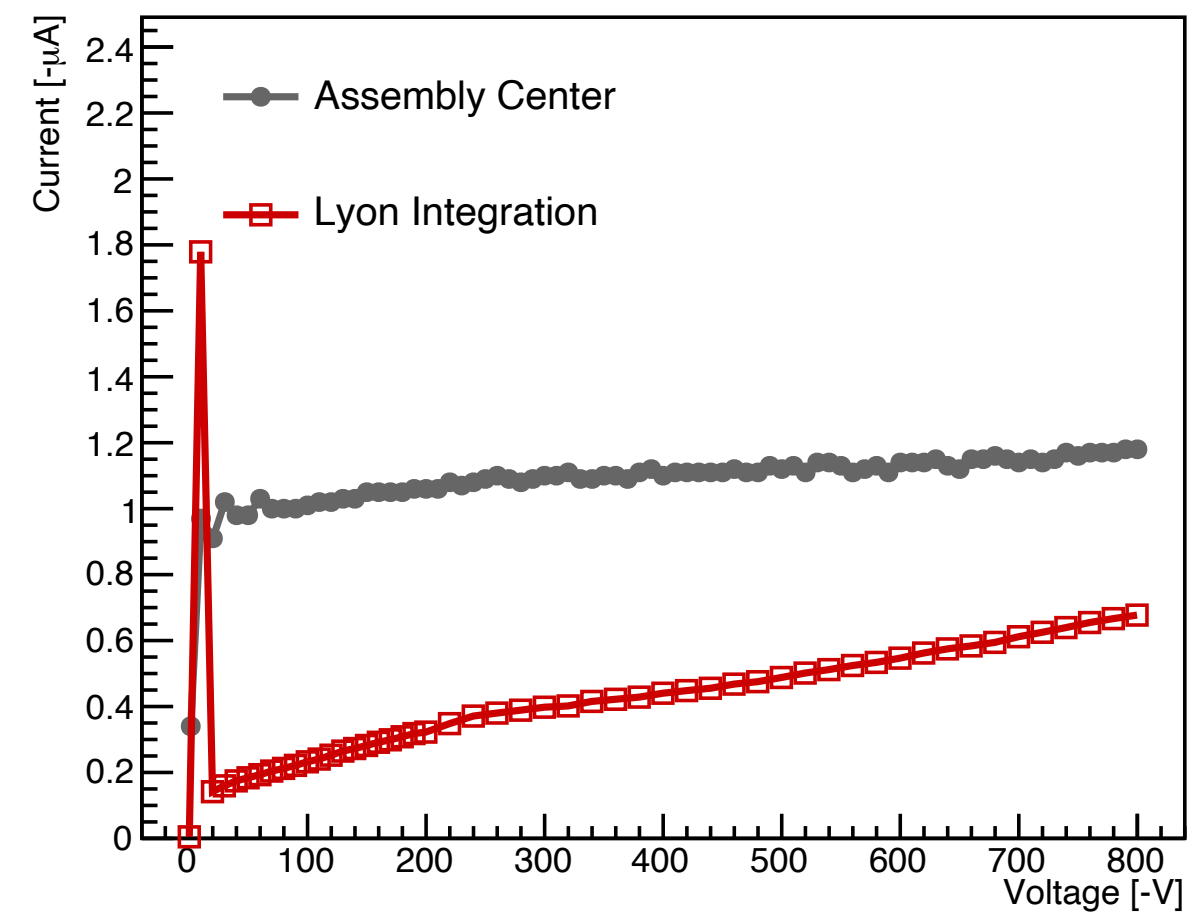
Strip Noise - Hybrid 0 (PS_40_IPG-10018)



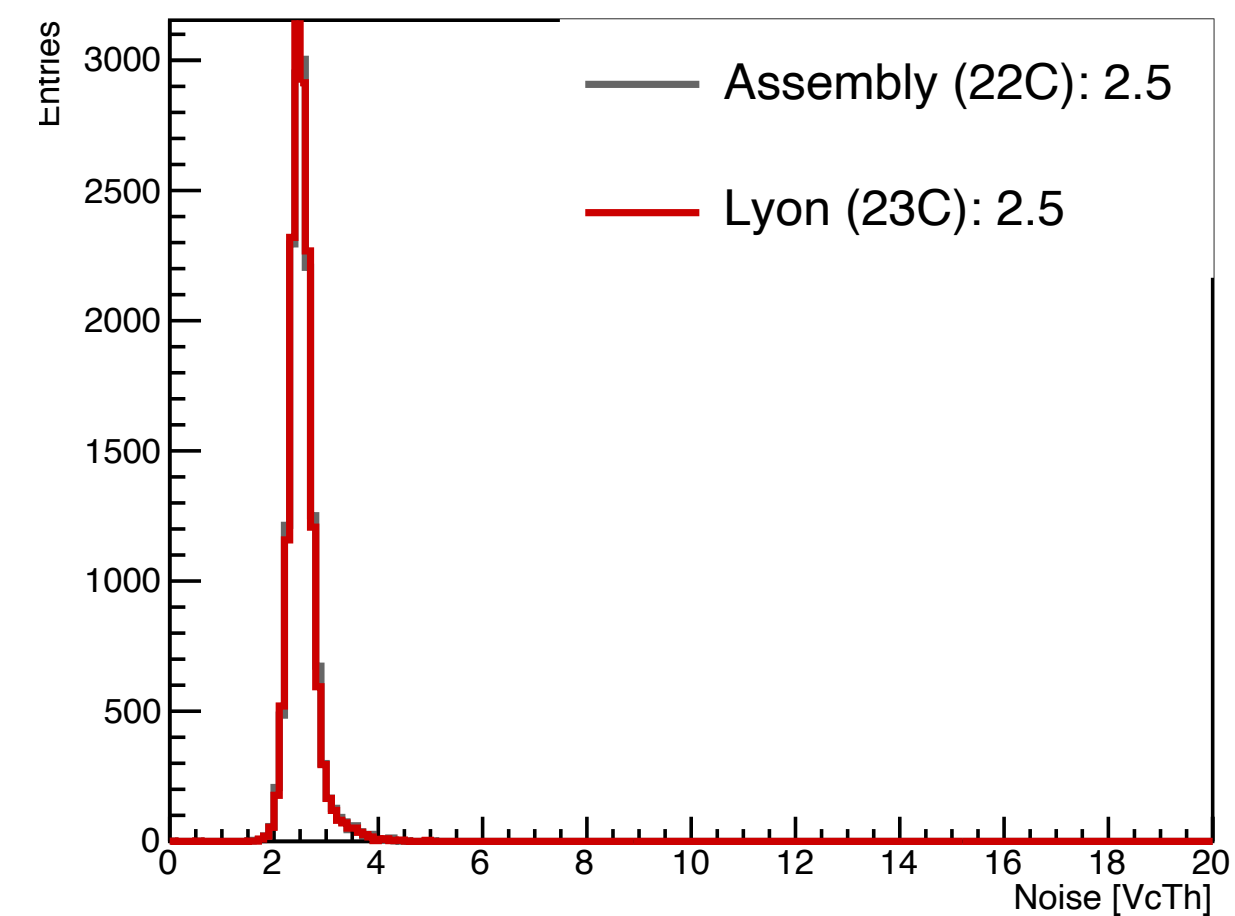
Strip Noise - Hybrid 1 (PS_40_IPG-10018)



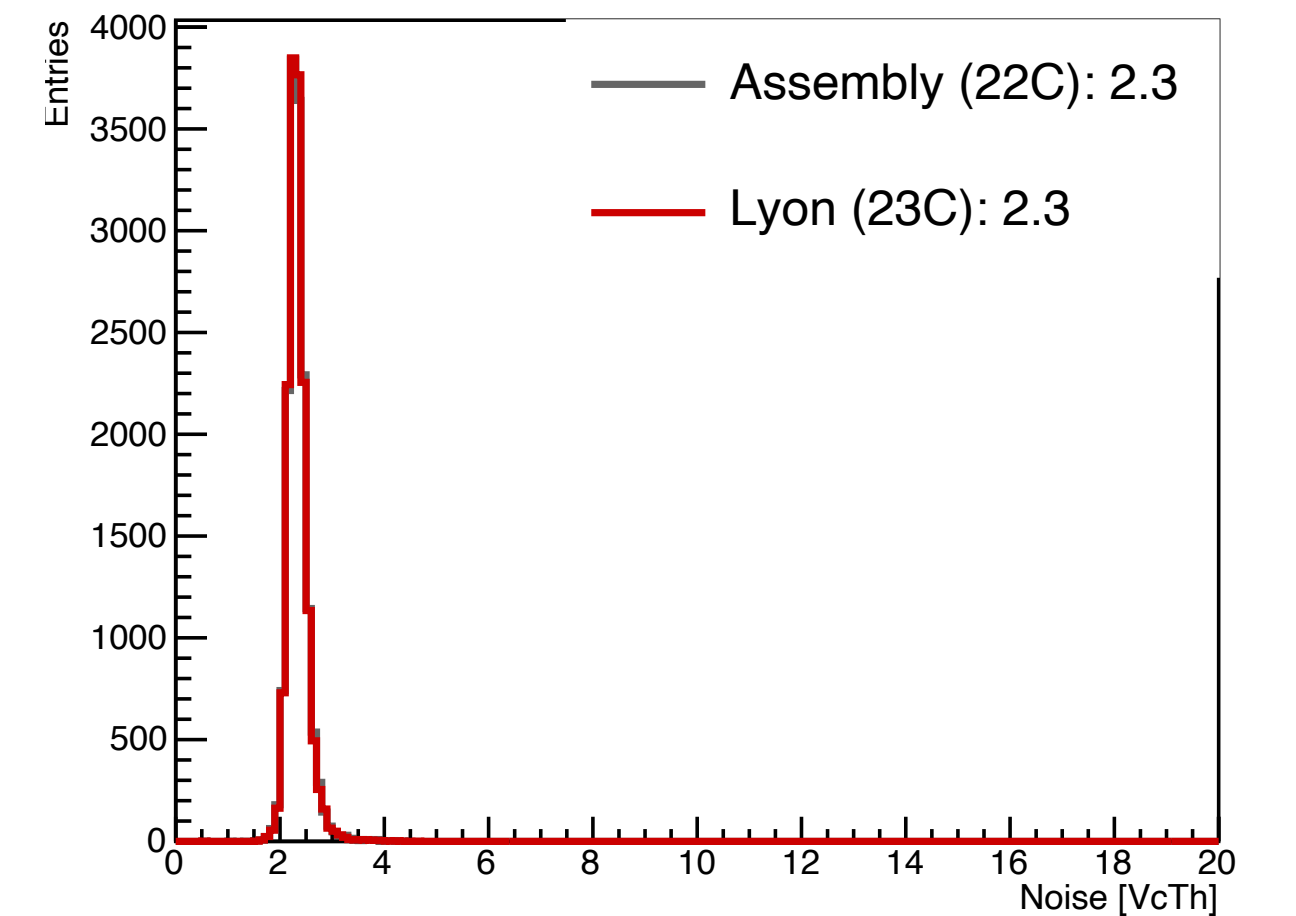
Leakage Current Comparison



Pixel Noise - Hybrid 0 (PS_40_IPG-10018)



Pixel Noise - Hybrid 1 (PS_40_IPG-10018)



Integration

First time in Lyon



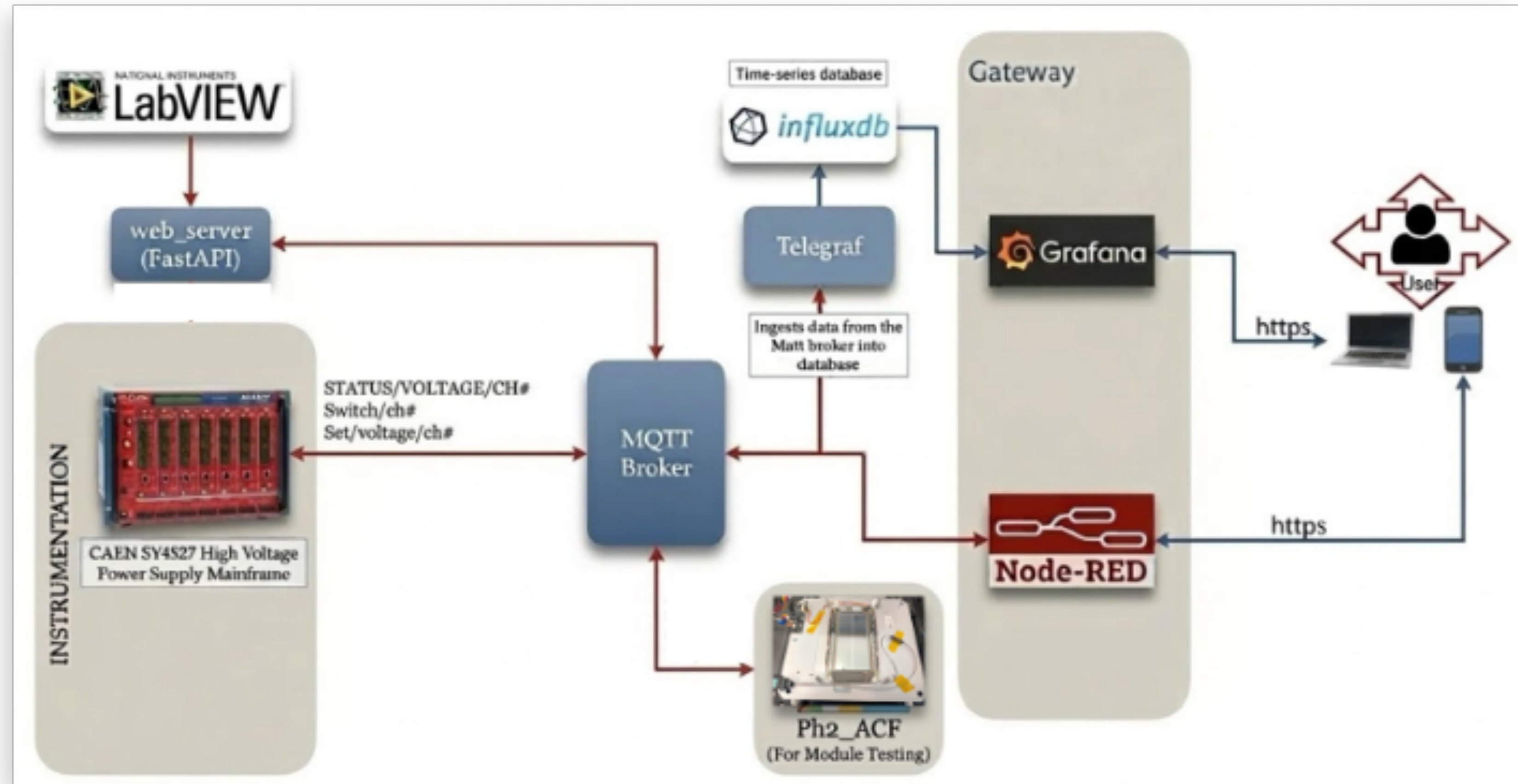
News

1. We integrated two production 2S and PS modules on a Dee using the Integration Software.
2S Modules:
2S_40_6_KIT-10024
PS_40_IPG-10017
2. We powered the module with Low voltage.
3. The LV current was as expected 270 mA for 2S and 500 mA for PS.
4. We performed basic communication tests successfully.

Ongoing work & To do

DCS

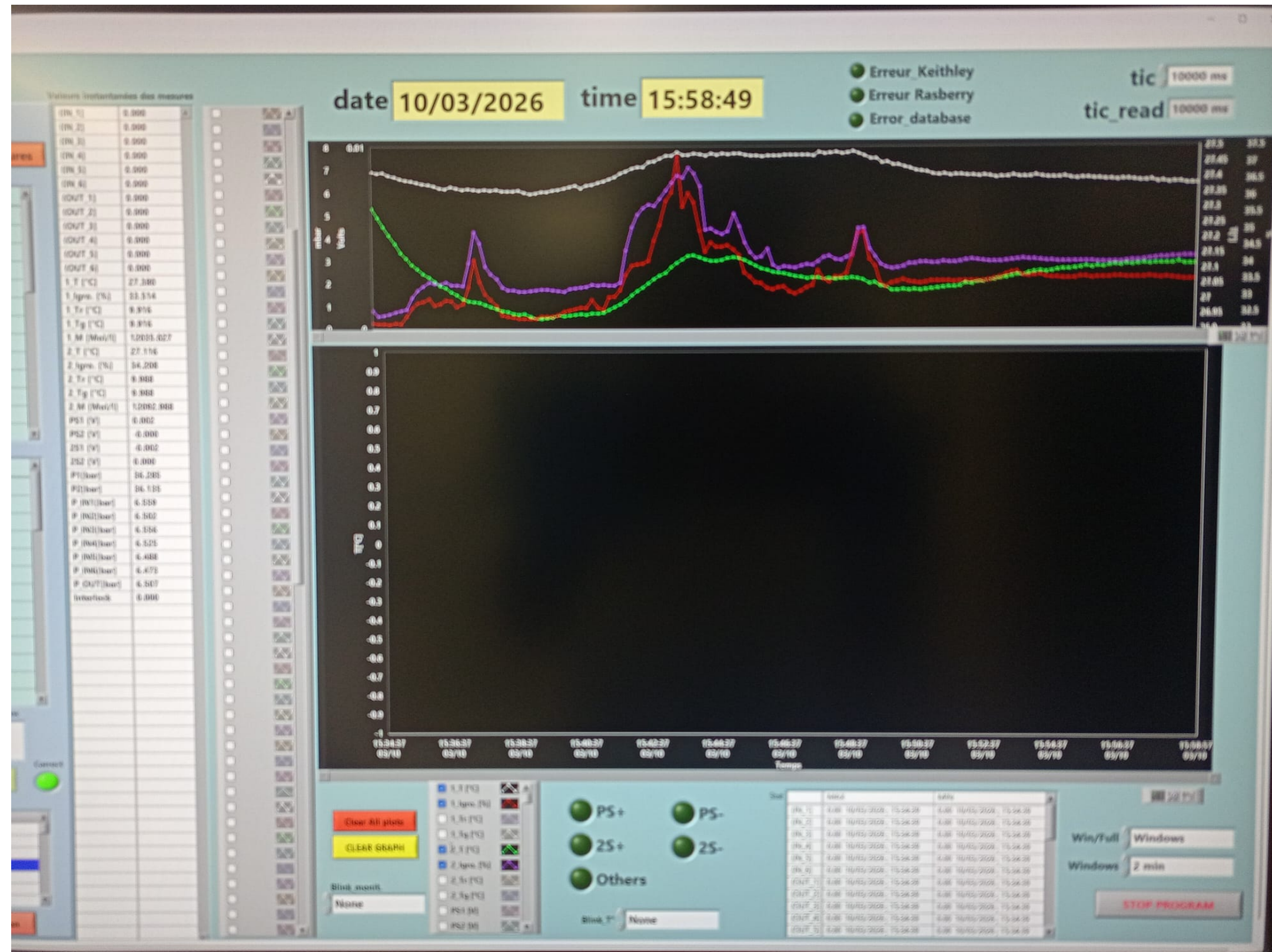
- New Diagram



Ongoing work & To do

DCS

- Labview data is visible in Grafana.



Ongoing work & To do

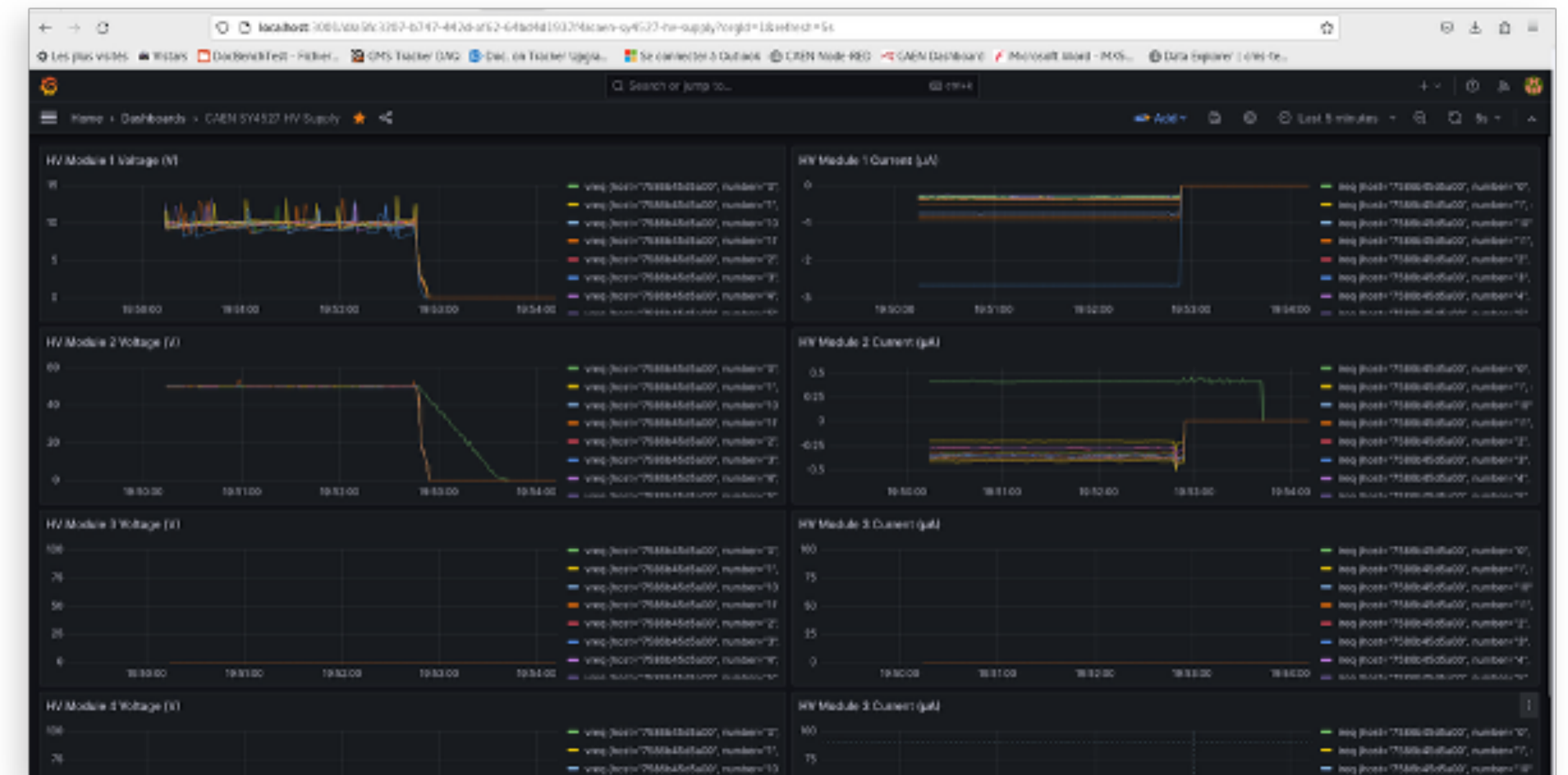
Cold Test, DCS

1. Prepare Nodered dashboard for CAEN control.

1. High Voltage Modules' Flow can be produced directly from Gustave's script and another script to validate.

2. The script is updated by Arnab for a few more features

1. Json file for sector test.



Ongoing work & To do

Cold Test, DCS

1. Right now we can control 4 HV modules and 5 LV modules.
2. All the parameters can be controlled.
3. We can check the status of each channel.
4. Only for one LV module the control is not predictable all the time.
5. Gustave and Celine will do the validation soon.

HV Module 1

CHANNEL	Channel 0	Channel 1	Channel 2	Channel 3	Channel 4	Channel 5	Channel 6	Channel 7	Channel 8	Channel 9	Channel 10	Channel 11	ALL CH ON
Slot Number for Module 1	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ALL CH OFF
Ramp Up Step (V/s)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Ramp Down Step (V/s)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Trip time (s)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Set Voltage (V)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Set Max Current (μ A)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Monitoring Voltage (V)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Monitoring Current (μ A)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

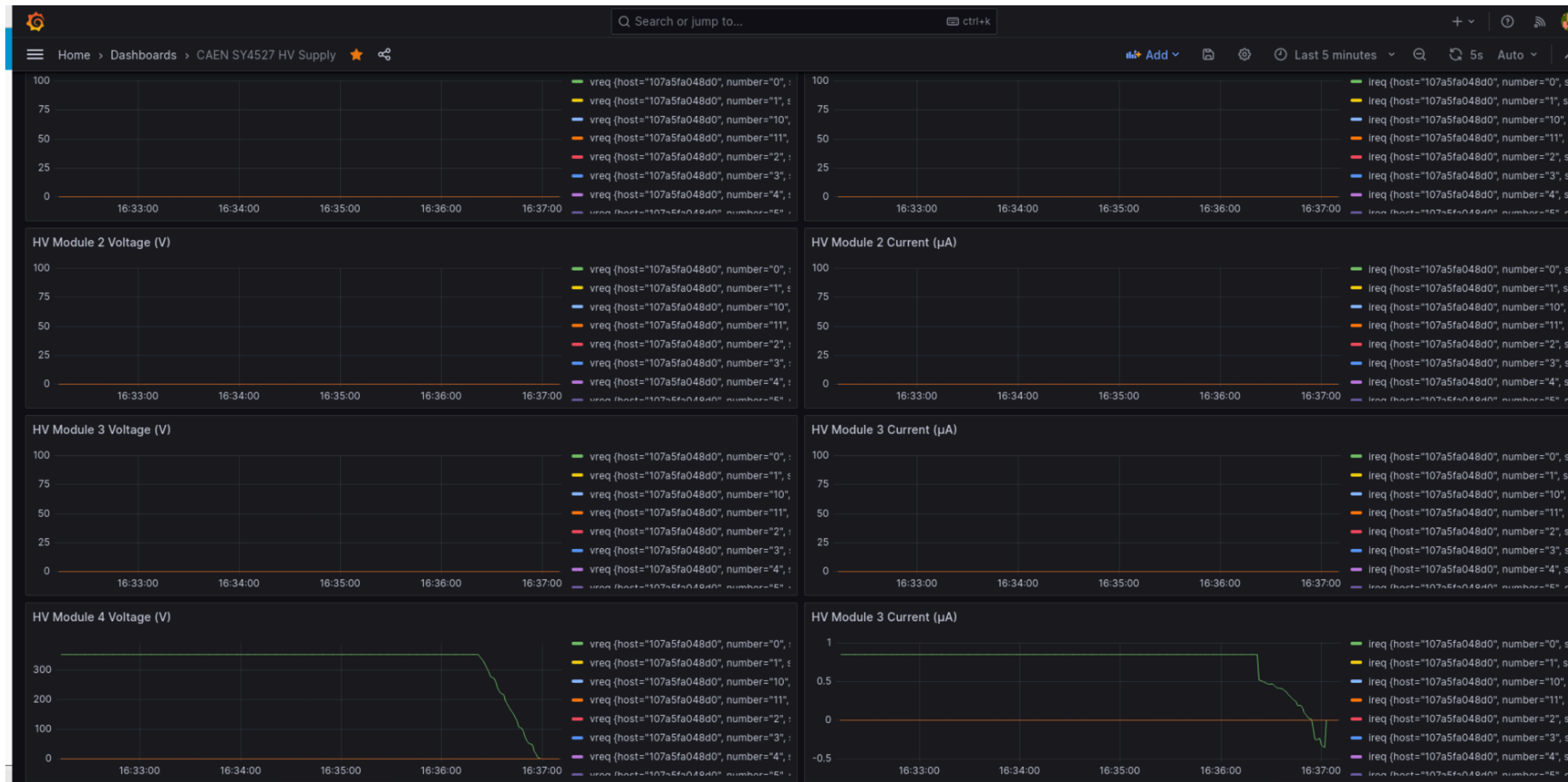
HV Module 2

HV Module 3

HV Module 4

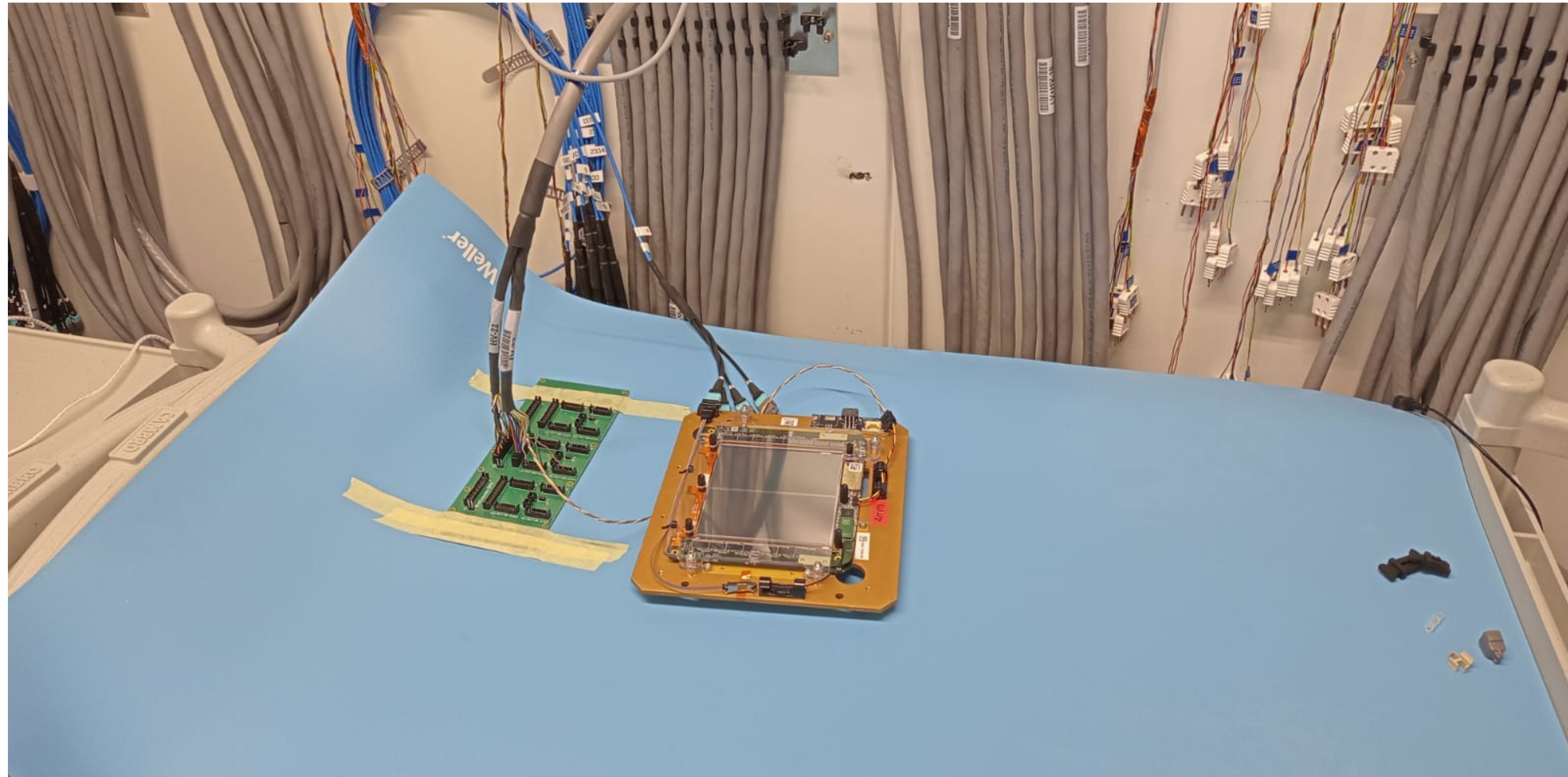
Ongoing work & To do

Cold Test, DCS



Ongoing work & To do

Cold Test, DCS



Ongoing work & To do

Cold Test, DCS

