



ESS spoke CM02 (2<sup>nd</sup> run) /CM05  
weekly meeting  
202103025  
Han Li



- CM05 incoming test
- CM02 cooldown
- FPC cold conditioning
- CTS test
- RF performance
- Test plan



# CM05 incoming test



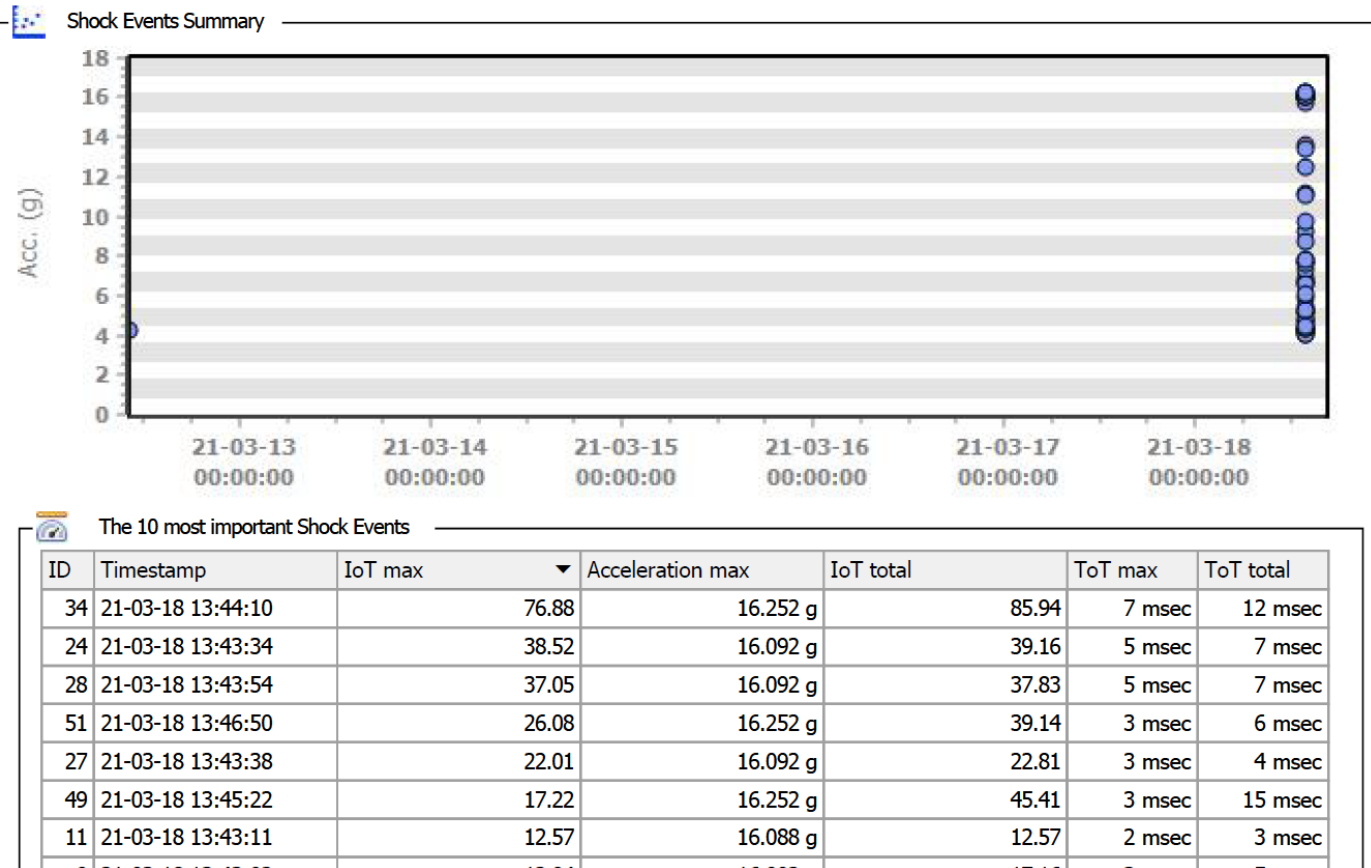
➤ All sensors and electrical continuity are OK

Cables verification CM05 at IJCLab			v1
Socket assembly		Verified by : G.Theron	
Socket name	PID name	Electrical value ( $\Omega$ ) (before shipping)	C / NC
LC01	TT04	68.31	C
	TT05	68,74	C
	TT06	74,3	C
	TT07	62.22	C
	TT08	67.25	C
	TT09	69.53	C
	TT10	108.08	C
	TT11	108.14	C
	TT12	67.12	C
	TT20	108.18	C
	TT21	108.24	C
	TT22	69.24	C
PT Coupler	TT120	107,64	C
	TT220	107,61	C
LC02	EH01	84.47	C
	EH02	84.56	C
	EH10	83.06	C
	EH20	82.28	C
LC03	SM10	2.43 / 2.46	C
	LS10	2.11	C
	SM20	2.50 / 2.49	C
	LS20	2.02	C
LC07	LT01	369.11	C
	LT02	369.86	C
Socket name	PID name	Electrical value ( $\mu F$ ) (before shipment)	C / NC
LC04	PZ10	12.86	C
	PZ11	12.84	C
	PZ20	12.71	C
	PZ21	12.70	C

Cables verification CM05 at UU			v1
Socket assembly		Verified by :	
Socket name	PID name	Electrical value ( $\Omega$ ) (before shipping)	C / NC
LC01	TT04	69,15	C
	TT05	69,45	C
	TT06	75,05	C
	TT07	62,8	C
	TT08	67,65	C
	TT09	69,8	C
	TT10	104,75	C
	TT11	106,45	C
	TT12	67,8	C
	TT20	104,25	C
	TT21	114,3	C
	TT22	69,9	C
PT Coupler	TT120	106,6	C
	TT220	106,4	C
LC02	EH01	83,4	C
	EH02	84,4	C
	EH10	82,9	C
	EH20	82	C
LC03	SM10	2,3 / 2,4	C
	LS10	1,9	C
	SM20	2,4 / 2,3	C
	LS20	1,9	C
LC07	LT01	366,6	C
	LT02	367,55	C
Socket name	PID name	Electrical value ( $\mu F$ ) (before shipment)	C / NC
LC04	PZ10	14	C
	PZ11	13,91	C
	PZ20	13,86	C
	PZ21	14,21	C

- NO vibration/shock above threshold has been logged.

## MSR Electronics

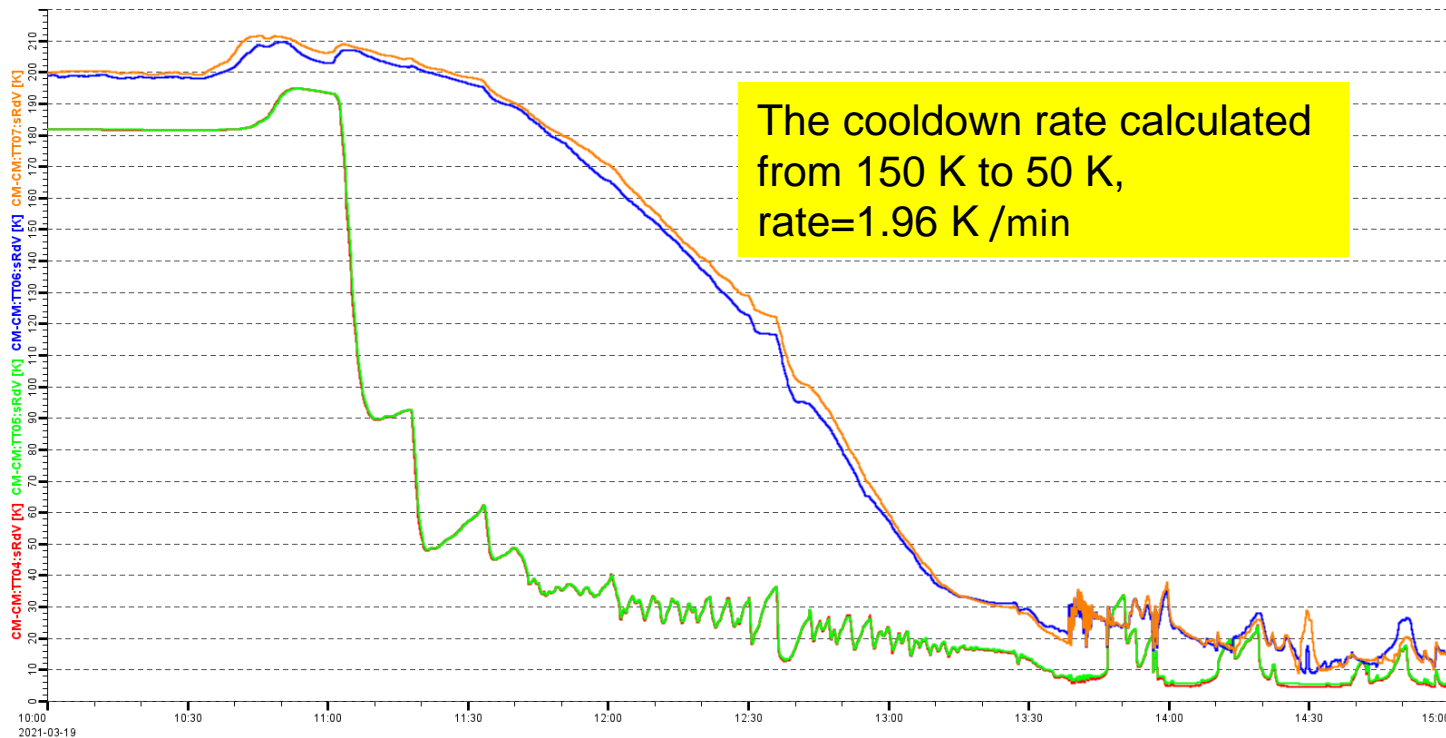




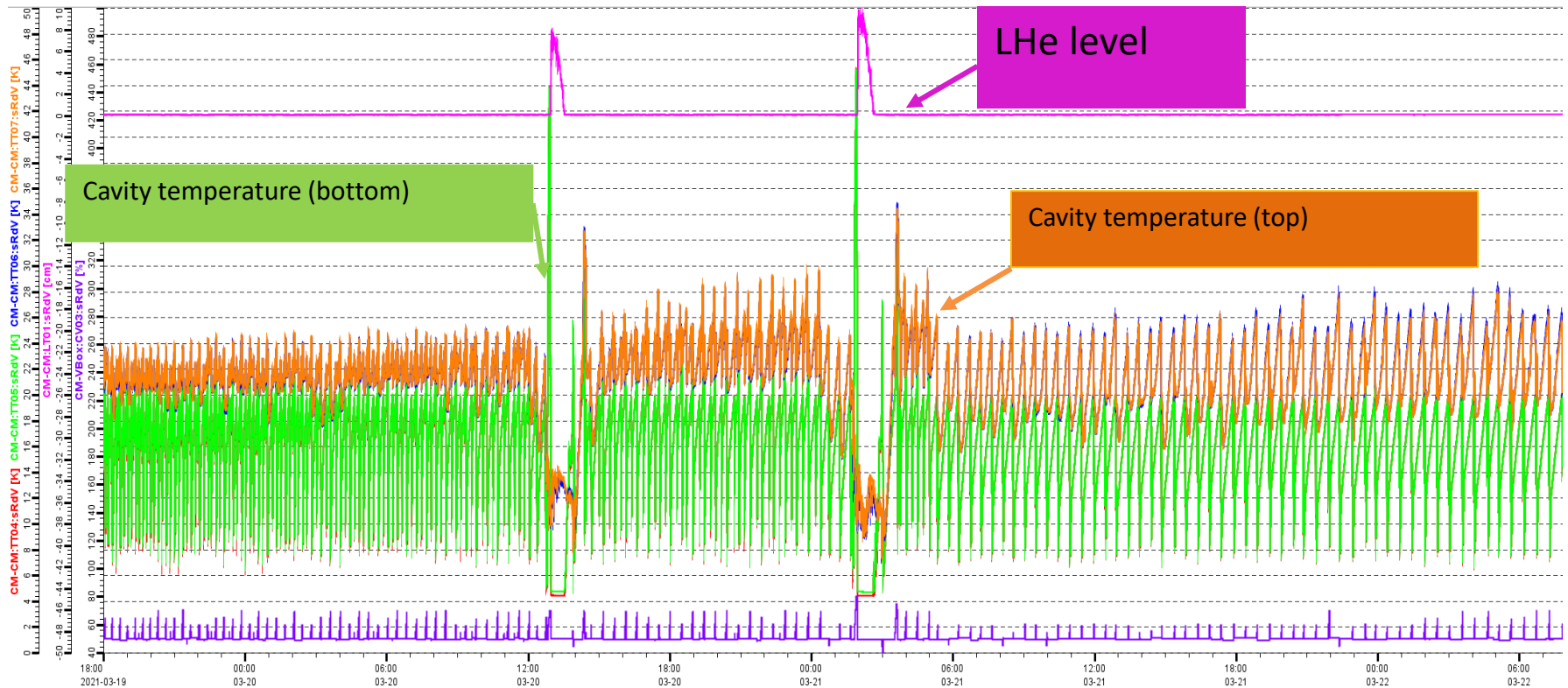
# CM02 cooldown



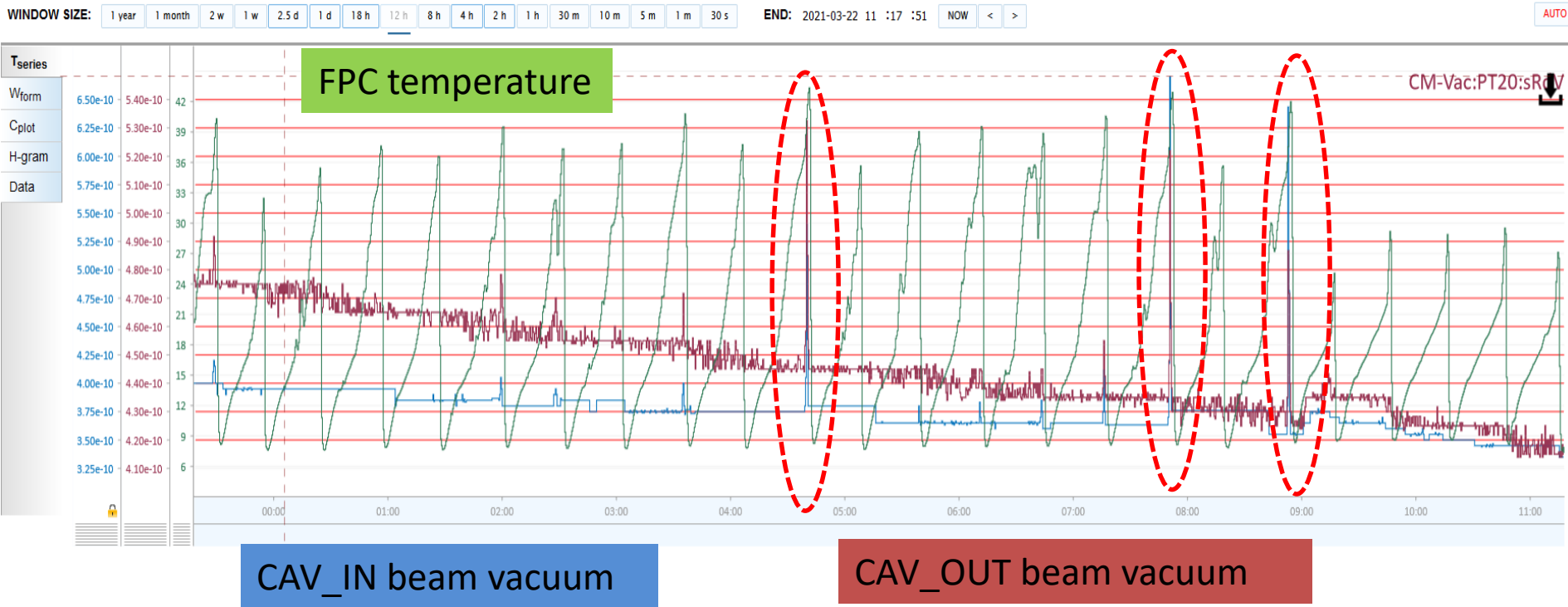
- Cooldown to 4 K on last Friday.
- Set the system with standby mode to 20 K during the weekend.
- Take the advantage of weekend to cool sown the whole system, mainly CTS



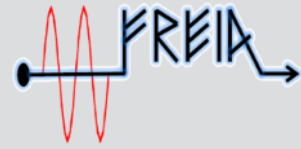
- Strange cavity temperature spike while there is LHe in the tank



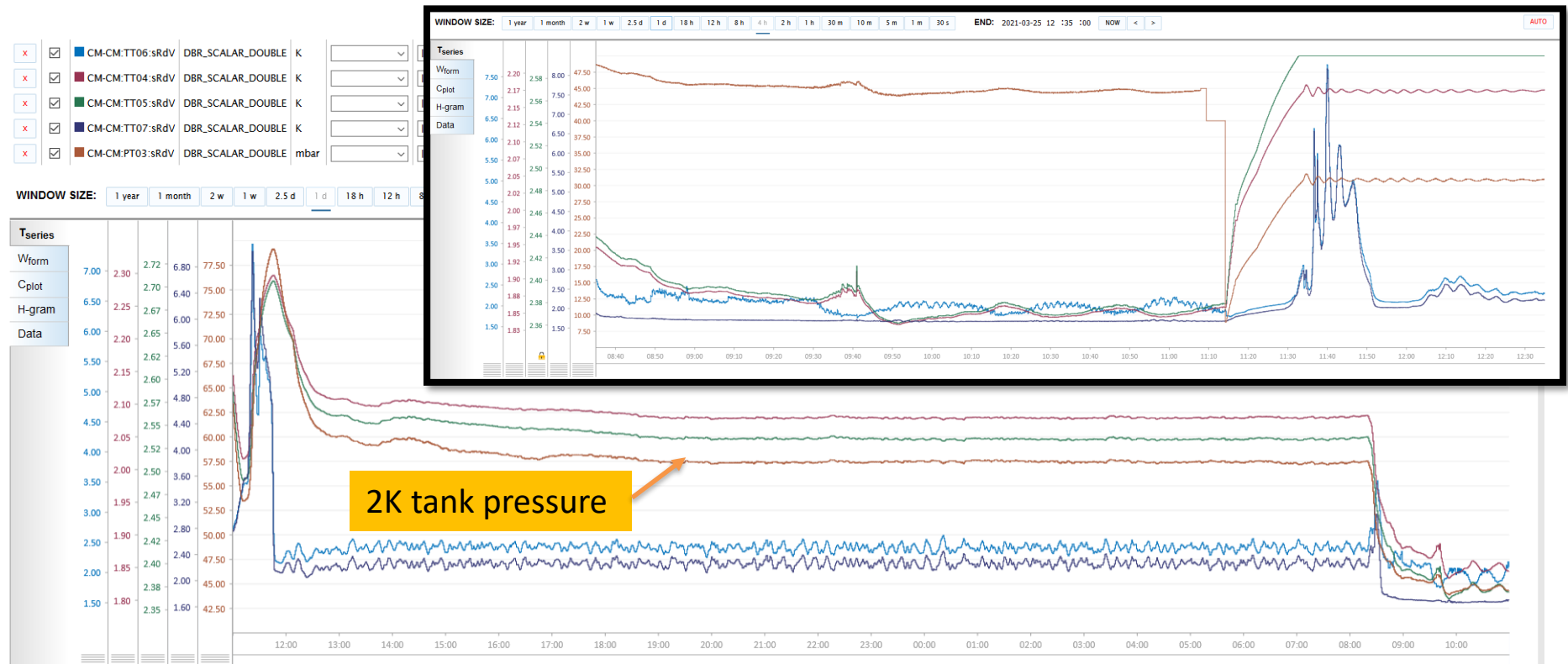
- Beam vacuum spike
- correlating to the coupler temperature
- Cavity temperature seems not affect the outgassing
- Should be just outgassing due to FPC temperature increasing



# 2 K cooldown

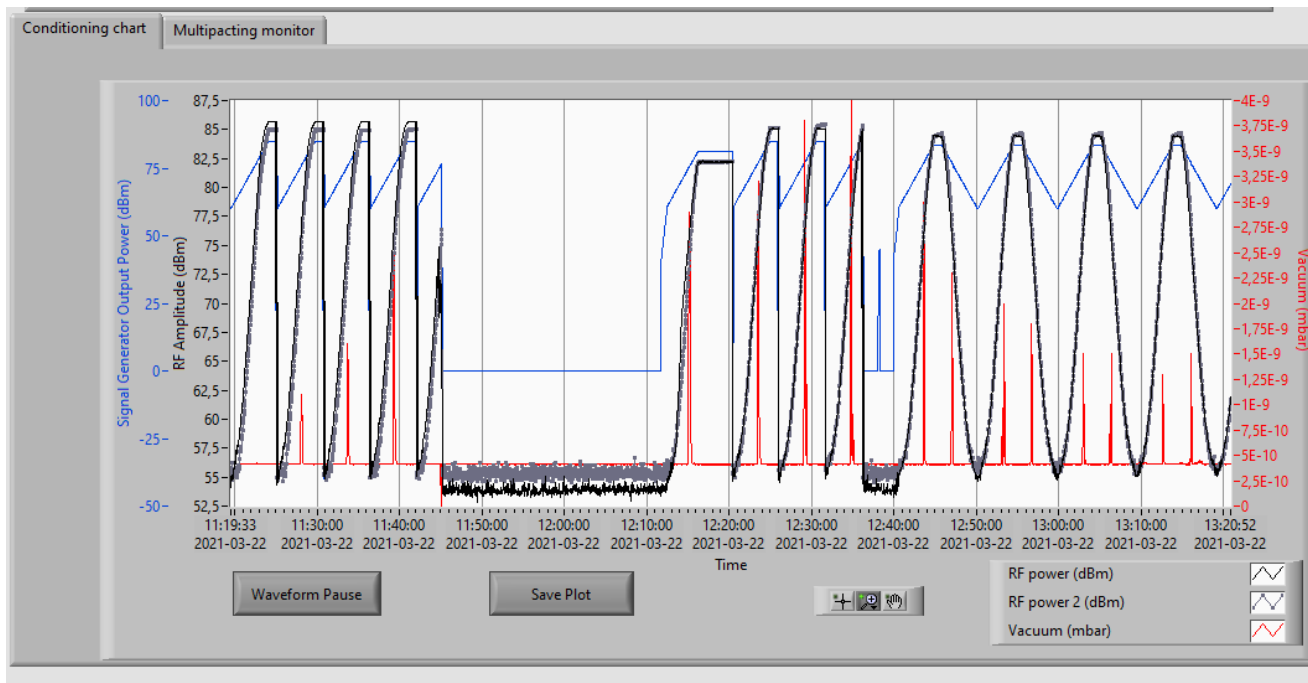


- Cooldown to 2 K took a bit more than one day.
- It looks we took a long time to reach “31 mbar”
- Because reading from the PT03 was not correct (due to the changes made in the connections between the output of the amplifier of PT03 signal and the compactRIO analog input )

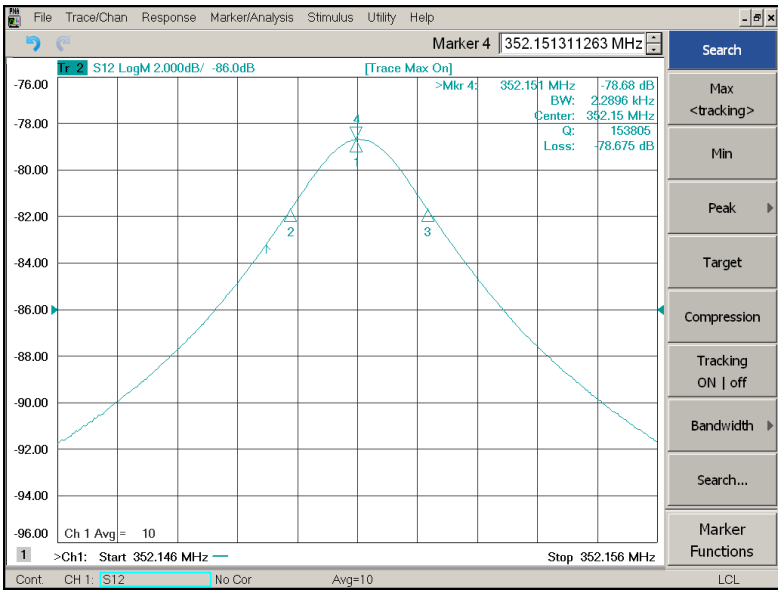




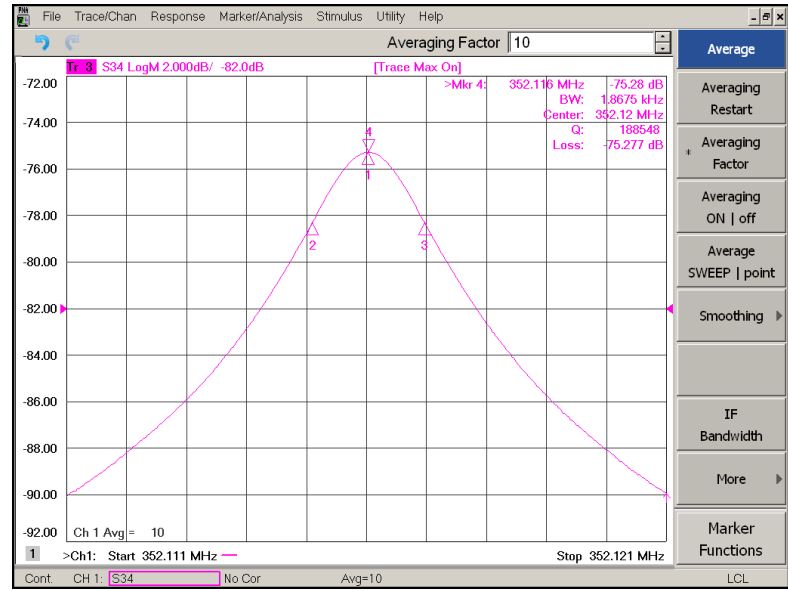
- FPC cold conditioning performed with 353 MHz
- Good vacuum baseline  $4E-10$  mbar
- Only small outgassing at 76 dBm has been observed
- FPC cold conditioning took 2 hours (including 0.5 hour downtime)



➤ Same issue with QL for CAV\_IN, even with different doorknob installation.



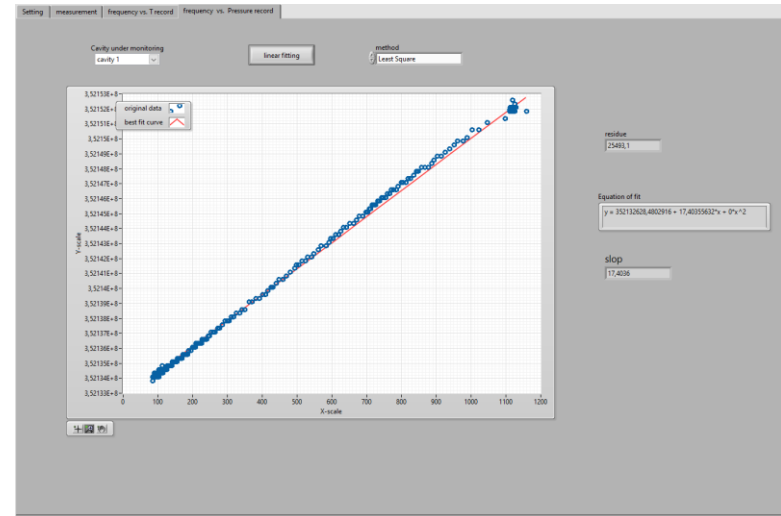
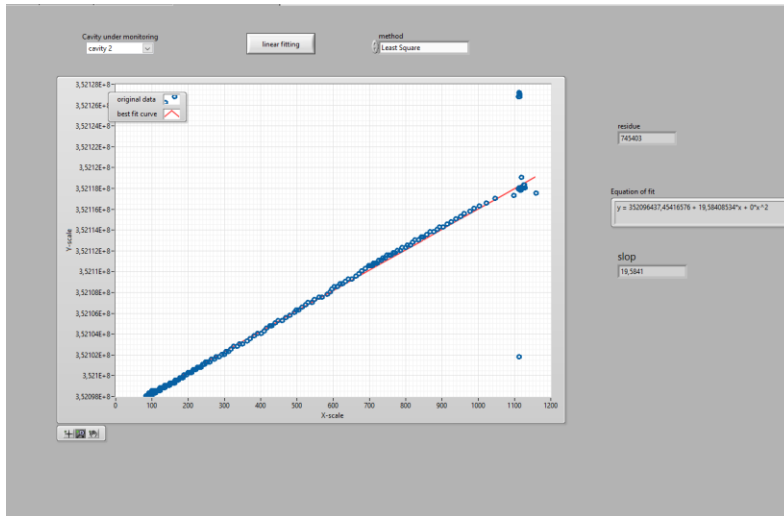
CAV\_IN



CAV\_OUT

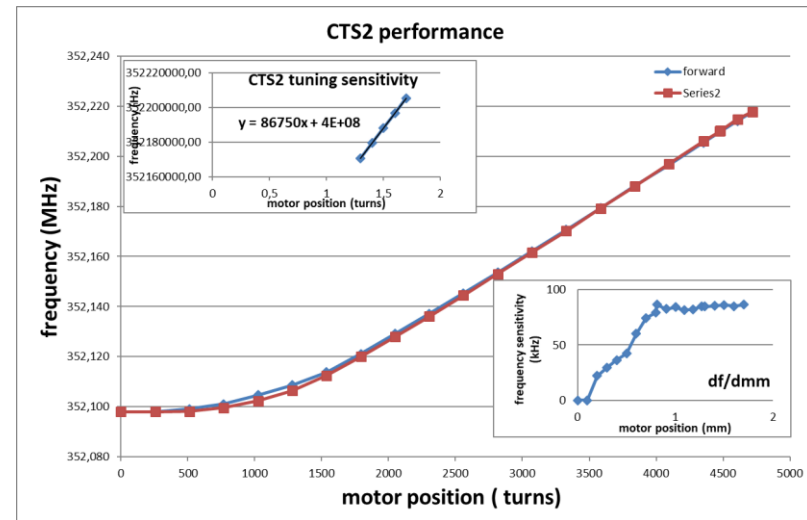
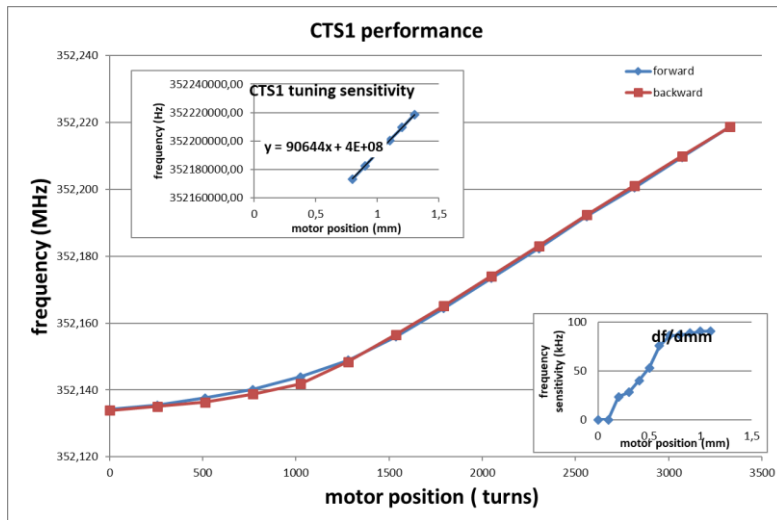
Cavity parameters				
		4 K	2K	QL
First run	Cav_in	352.151	352.132	1.54E5
Second run		352.151	352.133	1.54E5
First run	Cav_out	352.114	352.094	1.94E5
Second run		352.116	352.098	1.89E5

- Measure from 1 bar to 31mbar (from 4K to 2K )
- Similar result as last run.

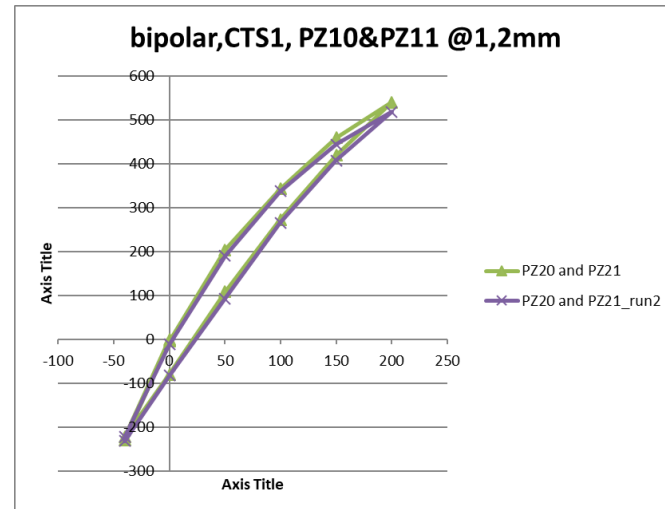
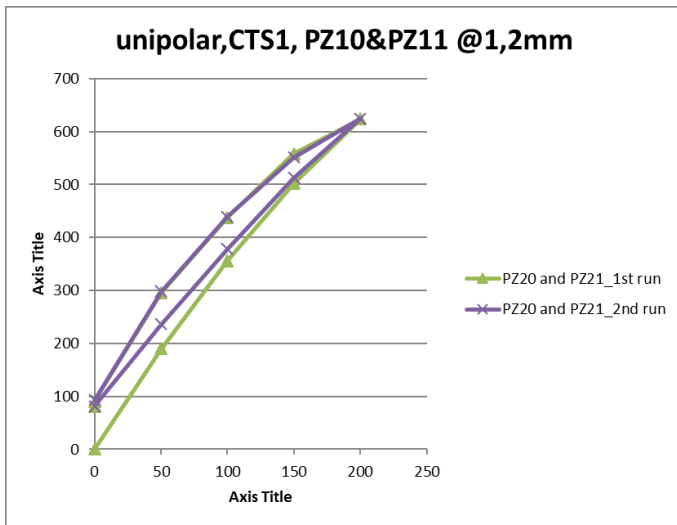
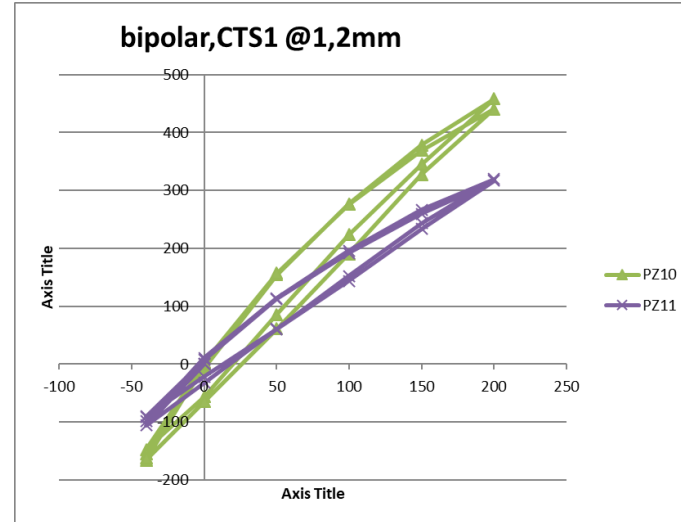
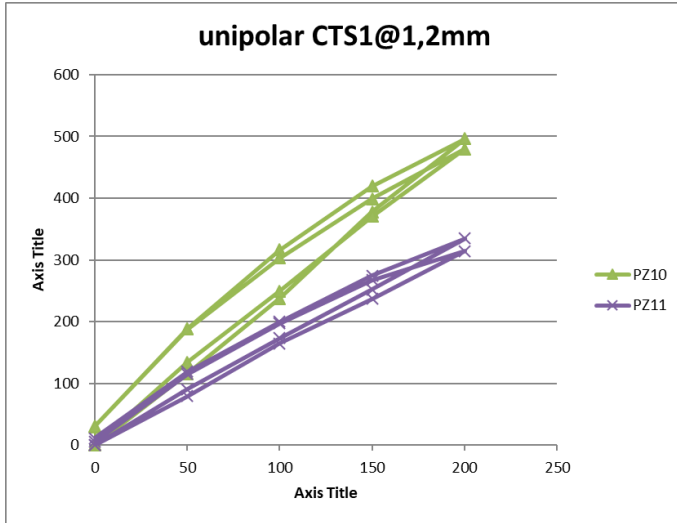


Pressure sensitivity		
First run	Cav_in	17.5 Hz/mbar
Second run		17.5 Hz/mbar
First run	Cav_out	18.6 Hz/mbar
Second run		19.6 Hz/mbar

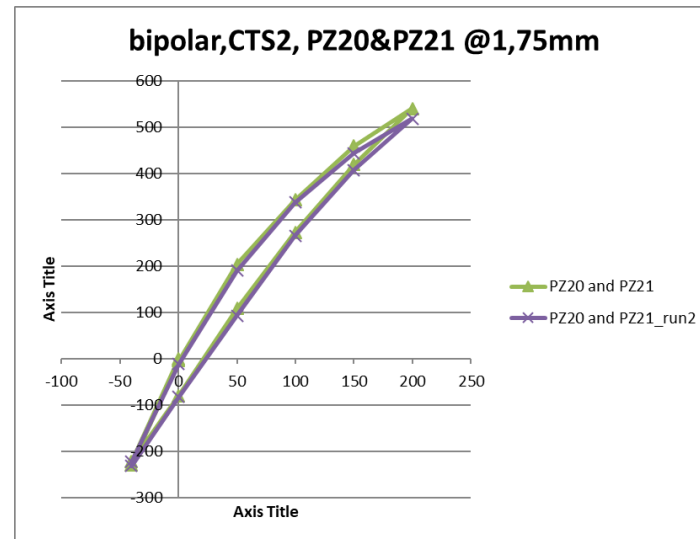
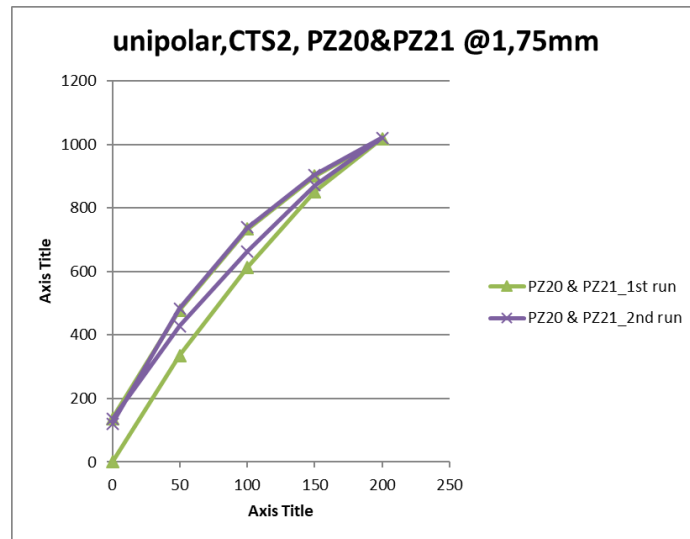
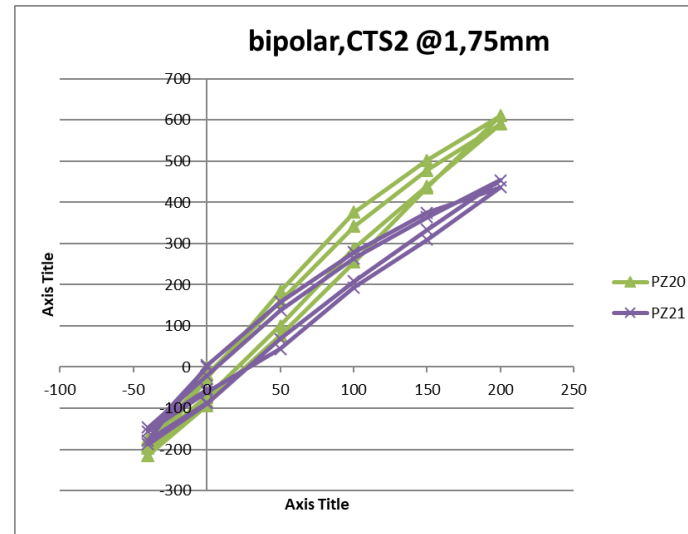
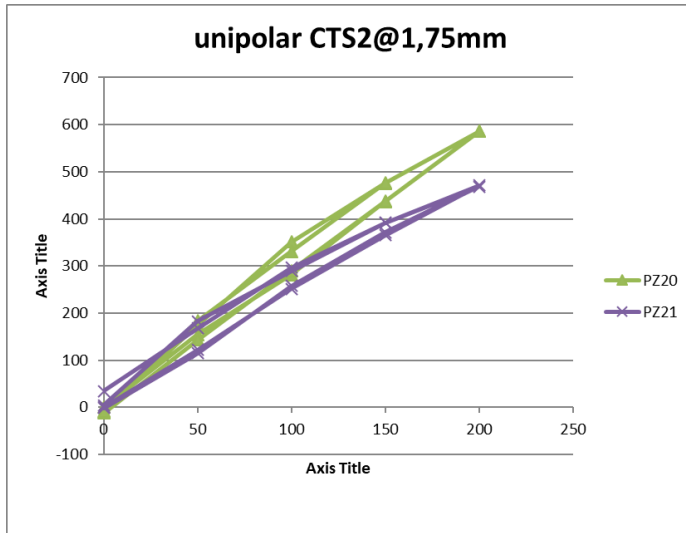
- Both CTSs work well with 0.6 A driving current.
- No missing step has been observed.
- Both CTSs meet the target frequency (CTS1 1.2 mm & CTS2 1.75 mm )



Tuning sensitivity		Position for target frequency	
First run	Cav_in	--	--
Second run		90.6 KHz/mm	1.2 mm
First run	Cav_out	85 KHz/mm	1.74 mm
Second run		86.7 KHz /mm	1.74 mm



# Piezo test





Test item	time	comment
CM04 Warm up (RGA connect) CM02 arrival	15 <sup>th</sup> -21 <sup>th</sup> Feb.	
CM02 installation CM04 Disconnect, packing, shipment	1 <sup>st</sup> - 12 <sup>th</sup> Mar.	
CM02 FPC warm conditioning	15 <sup>th</sup> -17 <sup>th</sup> Mar.	CM02
CM alignment measurement	16 <sup>th</sup> Mar.	CM02
Heater repair	18 <sup>th</sup>	
CM cooldown to 4 K	19 <sup>th</sup> Mar.	
FPC cold conditioning	22 <sup>th</sup> Mar.	Simultaneously
CM cooldown to 2 K	24 <sup>rd</sup> Mar.	
CTS test	24 <sup>th</sup> Mar.	CTS measurement
alignment at cold	25 <sup>th</sup> Mar.	
Cavity conditioning (on resonance) Heat load/Q measurement	25 <sup>th</sup> -26 <sup>th</sup> Mar.	Open loop
Warm up	27 <sup>th</sup> -31 <sup>st</sup> Mar	
alignment at warm	1 <sup>st</sup> Apr.	
Disconnect, packing, shipment	2 <sup>nd</sup> -9 <sup>th</sup> Apr.	