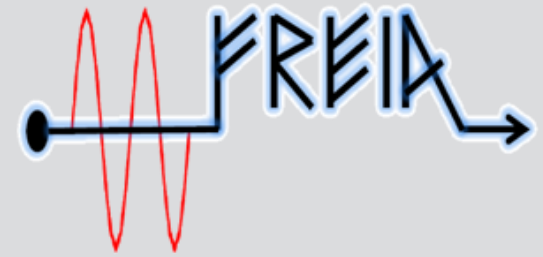




UPPSALA  
UNIVERSITET



# ESS weekly meeting (2024 W14)

FREIA team





# Local planning



week		W13											
date		MON		TUE		WED		THU		FRI		SAT	SUN
		25-Mar		26-Mar		27-Mar		28-Mar		29-Mar		30-Mar	31-Mar
		m	a	m	a	m	a	m	a	m	a		
Last CM	CM14	LHe cooling		4K filling	Pumping to 2K	CTS thermalization		CTS test		Easter			
week		W14											
date		MON		TUE		WED		THU		FRI		SAT	SUN
		1-Apr		2-Apr		3-Apr		4-Apr		5-Apr		6-Apr	7-Apr
		m	a	m	a	m	a	m	a	m	a		
Last CM	CM14	Easter		MP conditioning				Heat load meas		Go from 2 K to 4K Start warm up			
week		W15											
date		MON		TUE		WED		THU		FRI		SAT	SUN
		8-Apr		9-Apr		10-Apr		11-Apr		12-Apr		13-Apr	14-Apr
		m	a	m	a	m	a	m	a	m	a		
Last CM	CM14	Warm up completed, open the bunker		Disconnect lines		Dismount doornobs	Outgoing test	Filling with GM2	Pack the box				
week		W16											
date		MON		TUE		WED		THU		FRI		SAT	SUN
		15-Apr		16-Apr		17-Apr		18-Apr		19-Apr		20-Apr	21-Apr
		m	a	m	a	m	a	m	a	m	a		
Last CM	CM14	Departure to ESS, Report publishing											

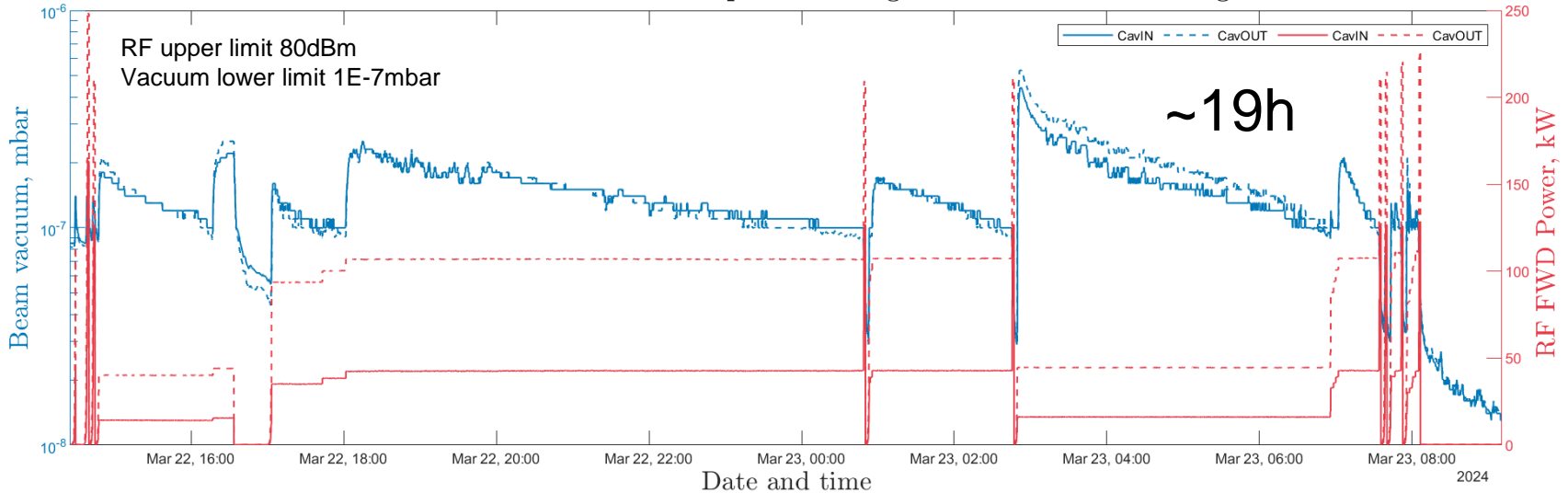
We are here

Need to discuss

# Second FPC conditioning



Beam vacuum and RF FWD power during warm FPC conditioning

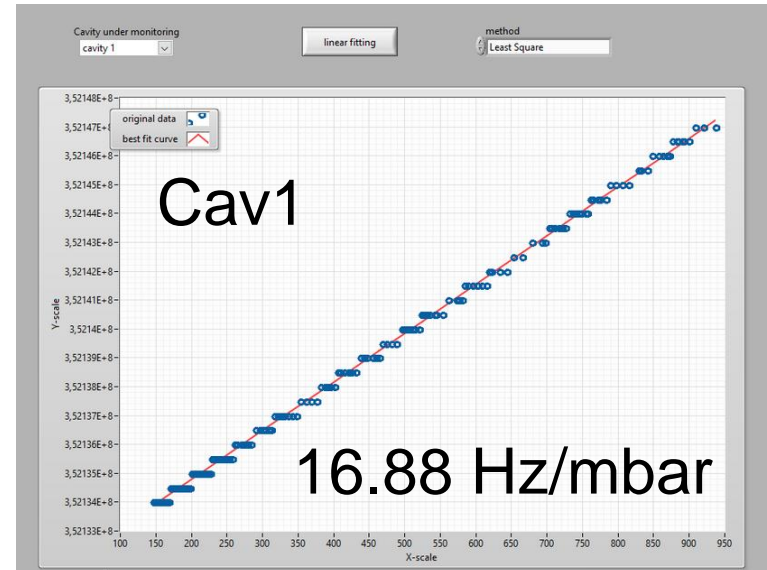
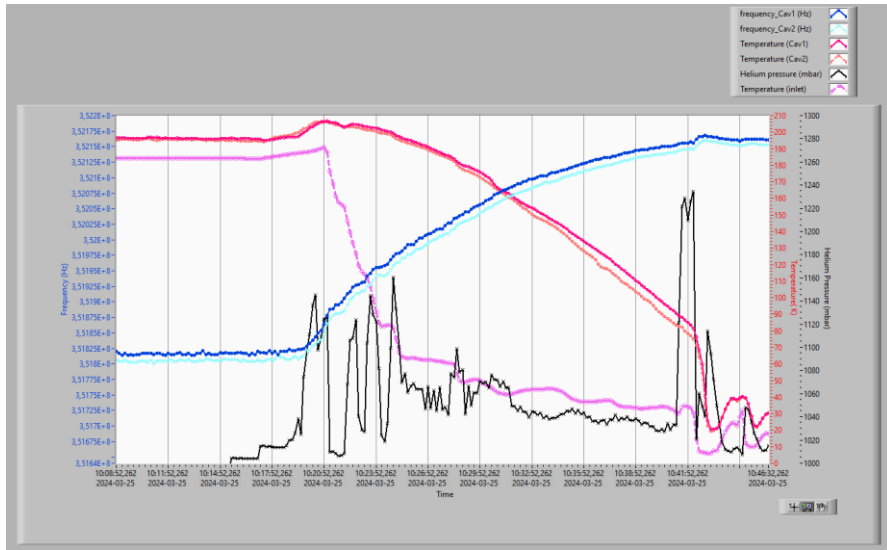


LLRF pulse width [us]



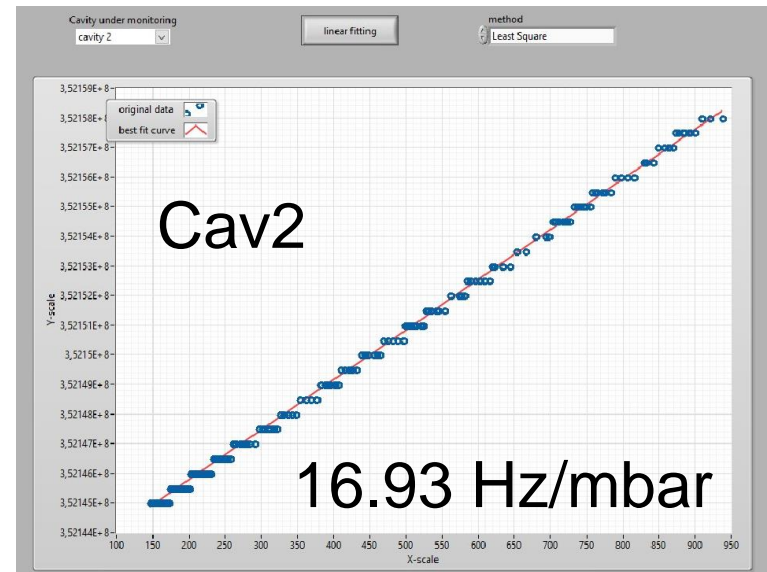
- Additional round of FPC cond. With more conservative setup.
- We decide to skip cold FPC conditioning.
- Esys and DB deliver different RF power -> problems with one of Esys preamplifier.

# F vs T & F vs P



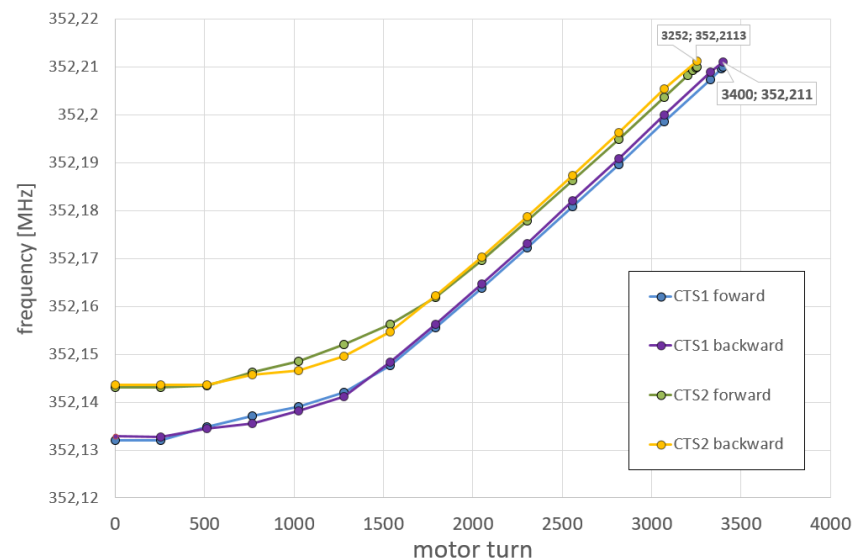
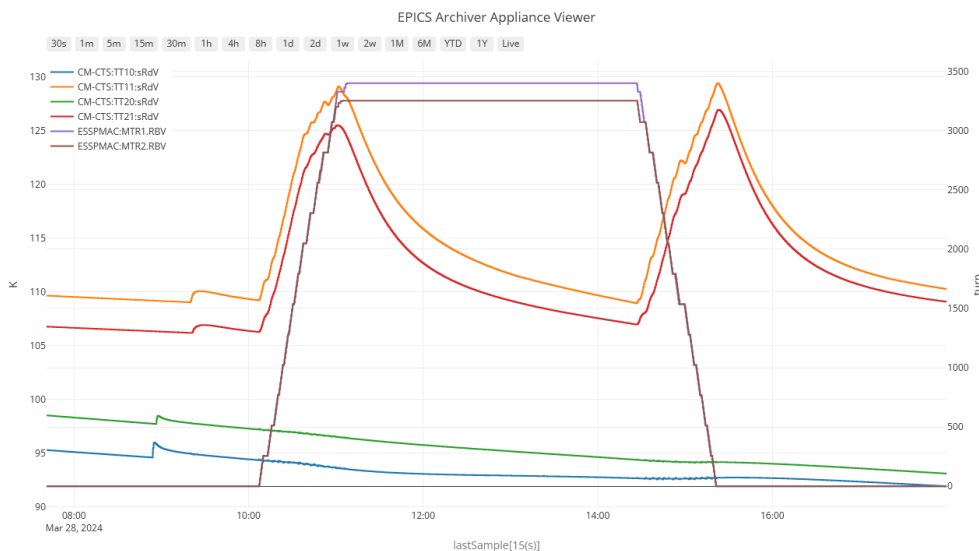
	Bandwidth measurement result_cav1	Bandwidth measurement result_cav2
Bandwidth	4490,725	4291,651
Center frequency	352150900	352160300
QL	78417,39	82057,05
Loss	-83,3584	-81,59315
S22 MIN search	-33,7646	3,52E+8
S44 MIN search	-28,3093	3,52E+8

TT04 8,73729    TT06 16,768!    TT07 16,4823    TT05 8,65237    PT02 9999    PT03 1014,8





# CTS test. Stepper motor



	Unipolar [Hz]	Bipolar [Hz]
--	---------------	--------------

PZ10	732.73	913.66
PZ11	548.32	701.04
PZ10+PZ11	1012.41	1373.46
PZ20	644.68	874.71
PZ21	525.9	744.80
PZ20+PZ21	973.00	1316.52

## CTS1:

Hz/step =	0.171875
kHZ/mm =	88

## CTS2:

Hz/step =	0.175
kHZ/mm =	89.6

# Cavities multipacting conditioning



- Both cavities rich 12MV/m with no (so far) F.E.

## Cav1

Pf_max (dBm) 81,1189	Pf_max (W) 129386	P_total (W) 0	Qt_Toms Method 2,77541	QL 196500	Qt 2,43E+11
Pr_max (dBm) 86,8534	Pr_max (W) 484555	P_static (W) 0	Qt_fr_Prefl_max 4,02558	real time frequency_fc 0E+0	
Pt_max (dBm) 25,2433	Pt_max (W) 0,334453	P_heater (W) 0	Qt_fr_Pforw_eoc 3,60748	Pc_dynamic(W) 0	
			QL_fr_Decay 198511	Vc_ave (MV) 0	

<b>Pf_max (W)</b>	<b>Q0_Dynamic</b>	<b>Eacc_Dynamic</b>	<b>Eacc_pk_Pt</b>	<b>Eacc_pk_Pf</b>
129386	0	0	9,20816	10,3006

## Cav2

Pf_max (dBm) 81,3976	Pf_max (W) 137962	P_total (W) 0	Qt_Toms Method 2,32465	QL 198000	Qt 2,64E+11
Pr_max (dBm) 85,8611	Pr_max (W) 385575	P_static (W) 0	Qt_fr_Prefl_max 3,02074	real time frequency_fc 0E+0	
Pt_max (dBm) 24,7886	Pt_max (W) 0,301203	P_heater (W) 0	Qt_fr_Pforw_eoc 3,44209	Pc_dynamic(W) 0	
			QL_fr_Decay 198208	Vc_ave (MV) 0	

<b>Pf_max (W)</b>	<b>Q0_Dynamic</b>	<b>Eacc_Dynamic</b>	<b>Eacc_pk_Pt</b>	<b>Eacc_pk_Pf</b>
137962	0	0	9,10823	10,677

Pf_max (dBm) 83,3842	Pf_max (W) 217982	P_total (W) 0	Qt_Toms Method 2,77812	QL 196500	Qt 2,43E+11
Pr_max (dBm) 89,3676	Pr_max (W) 864487	P_static (W) 0	Qt_fr_Prefl_max 3,93955	real time frequency_fc 0E+0	
Pt_max (dBm) 27,6672	Pt_max (W) 0,58442	P_heater (W) 0	Qt_fr_Pforw_eoc 3,30296	Pc_dynamic(W) 0	
			QL_fr_Decay 200034	Vc_ave (MV) 0	

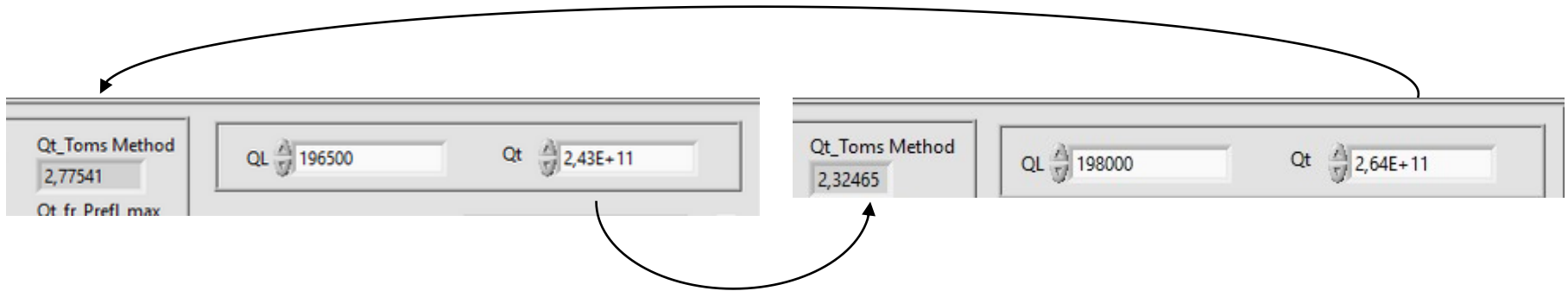
<b>Pf_max (W)</b>	<b>Q0_Dynamic</b>	<b>Eacc_Dynamic</b>	<b>Eacc_pk_Pt</b>	<b>Eacc_pk_Pf</b>
217982	0	0	12,1722	13,37

Pf_max (dBm) 84,0871	Pf_max (W) 256279	P_total (W) 0	Qt_Toms Method 2,32165	QL 198000	Qt 2,64E+11
Pr_max (dBm) 87,9468	Pr_max (W) 623270	P_static (W) 0	Qt_fr_Prefl_max 3,17411	real time frequency_fc 0E+0	
Pt_max (dBm) 27,2238	Pt_max (W) 0,527694	P_heater (W) 0	Qt_fr_Pforw_eoc 3,9681	Pc_dynamic(W) 0	
			QL_fr_Decay 197579	Vc_ave (MV) 0	

<b>Pf_max (W)</b>	<b>Q0_Dynamic</b>	<b>Eacc_Dynamic</b>	<b>Eacc_pk_Pt</b>	<b>Eacc_pk_Pf</b>
256279	0	0	12,0558	14,5522

## Cav1

## Cav2



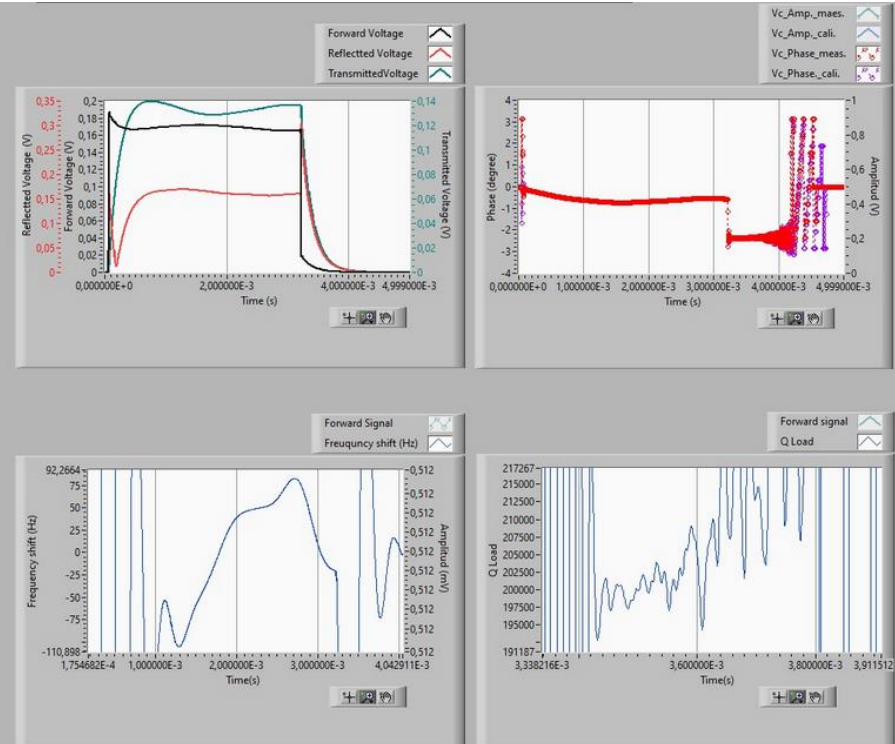
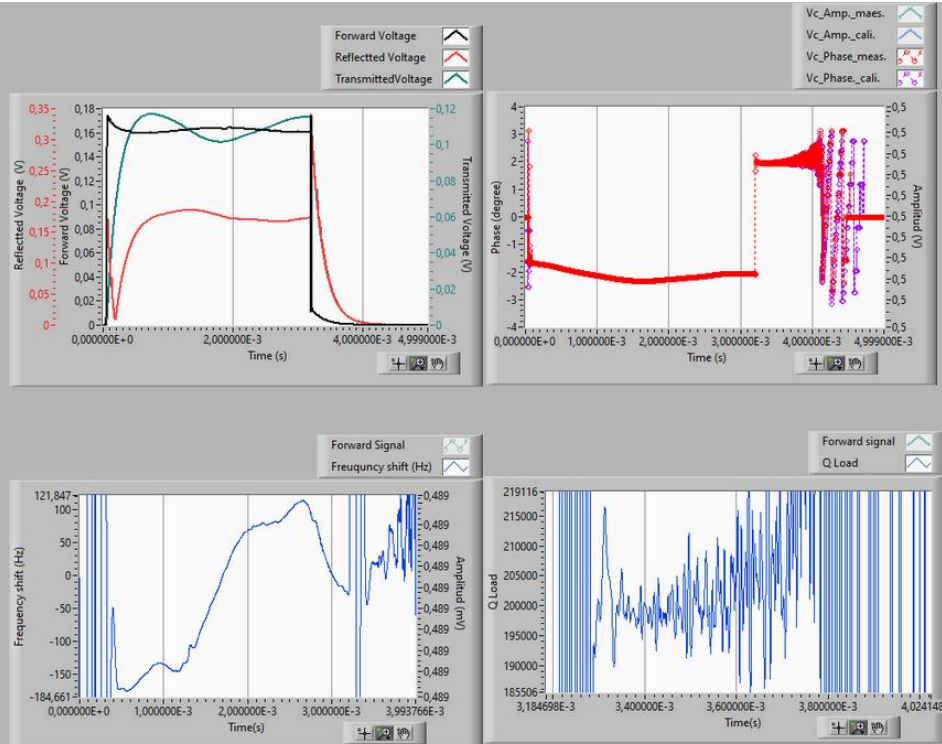
Pf_max (dBm) 81,1189	Pf_max (W) 129386	P_total (W) 0	Qt_Toms Method 2,77541	QL 196500	Qt 2,43E+11
Pr_max (dBm) 86,8534	Pr_max (W) 484555	P_static (W) 0	Qt_fr_Prefl_max 4,02558	real time frequency_fc 0E+0	
Pt_max (dBm) 25,2433	Pt_max (W) 0,334453	P_heater (W) 0	Qt_fr_Pforw_eoc 3,60748	Pc_dynamic(W) 0	
			QL_Decay 198511	Vc_ave (MV) 0	
<b>Pf_max (W)</b> 129386	<b>Q0_Dynamic</b> 0	<b>Eacc_Dynamic</b> 0	<b>Eacc_pk_Pt</b> 9,20816	<b>Eacc_pk_Pf</b> 10,3006	

Pf_max (dBm) 81,3976	Pf_max (W) 137962	P_total (W) 0	Qt_Toms Method 2,32465	QL 198000	Qt 2,64E+11
Pr_max (dBm) 85,8611	Pr_max (W) 385575	P_static (W) 0	Qt_fr_Prefl_max 3,02074	real time frequency_fc 0E+0	
Pt_max (dBm) 24,7886	Pt_max (W) 0,301203	P_heater (W) 0	Qt_fr_Pforw_eoc 3,44209	Pc_dynamic(W) 0	
			QL_Decay 198208	Vc_ave (MV) 0	
<b>Pf_max (W)</b> 137962	<b>Q0_Dynamic</b> 0	<b>Eacc_Dynamic</b> 0	<b>Eacc_pk_Pt</b> 9,10823	<b>Eacc_pk_Pf</b> 10,677	



## Cav1

## Cav2

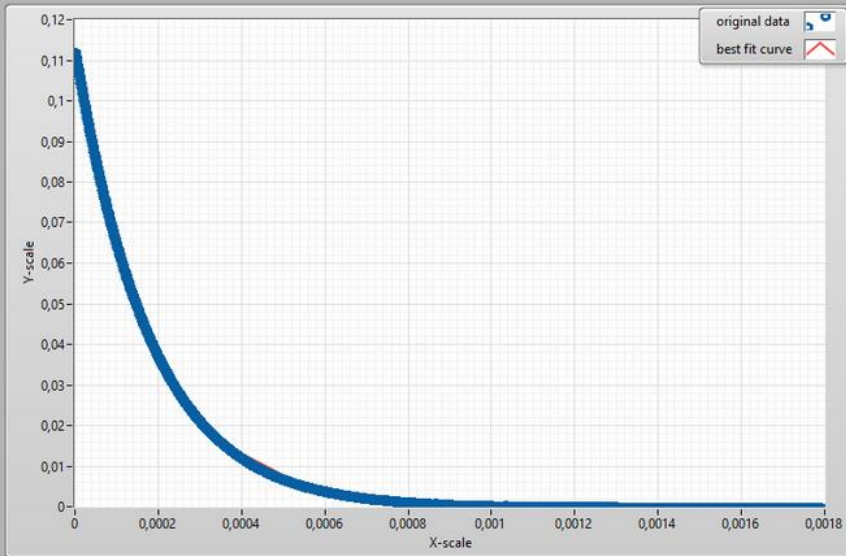


+120Hz to -180Hz  
300Hz total

+92Hz to -111Hz\*  
200Hz total

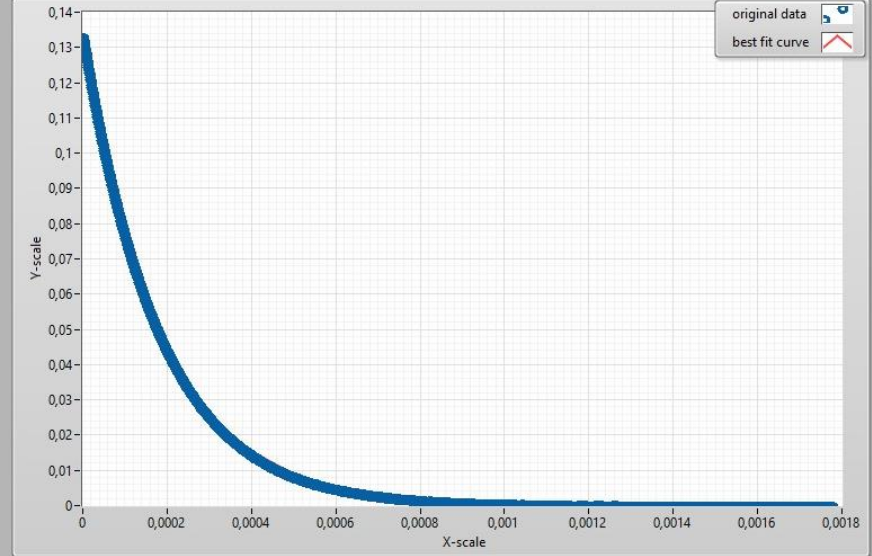
\* May be little bit optimistic

## Cav1



decay time  s    QL from decay time

## Cav2



decay time  s    QL from decay time

## IN PROGRESS

Both cavities at 9MV/m

Static. NO TUNERS engaged

Measured from 14:44:20 to 14:49:20 (CTS engaged)

FT551 = 13.88 m3/h (std dev 0.53 m3/h)  
 PT03\_min= 30.80 mbar  
 PT03\_max= 31.00 mbar  
 LT01\_min= 57.28 cm  
 LT01\_max= 59.30 cm

CV551=80%  
 CV03=30%  
 CV04=reg  
 CV01=0%

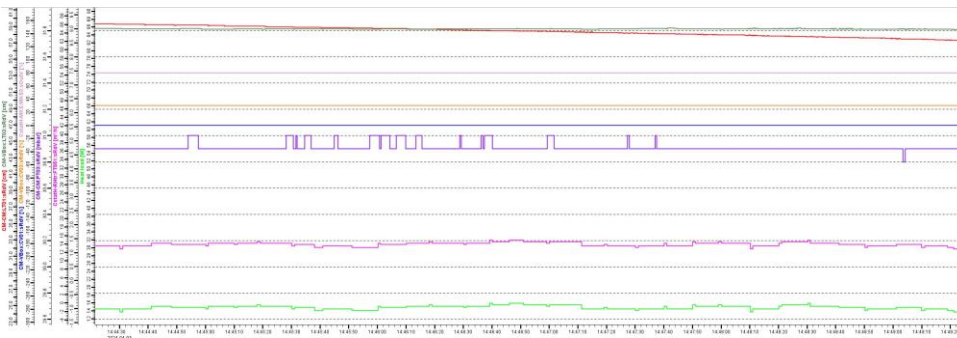
HL = 14.85 +- 0.56 W

Measured from 07:45:31 to 07:53:58 (CTS NOT engaged)

FT551 = 12.39 m3/h (std dev 0.36 m3/h)  
 PT03\_min= 31.10 mbar  
 PT03\_max= 31.30 mbar  
 LT01\_min= 57.35 cm  
 LT01\_max= 60.19 cm

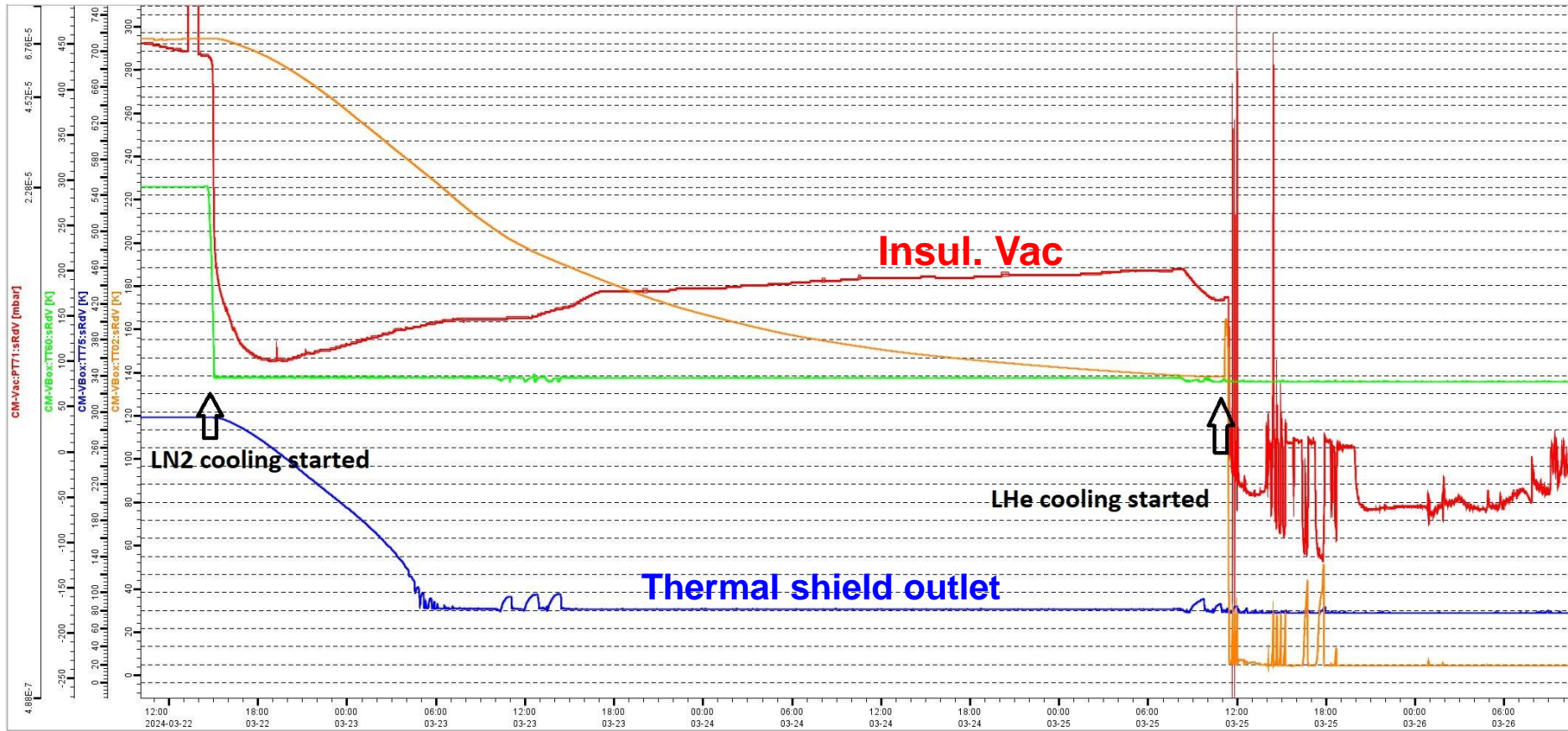
CV551=80%  
 CV03=30%  
 CV04=reg  
 CV01=0%

HL = 13.25 +- 0.39 W



Display Name	Sample Count	Mean	Median	Standard Deviation	Min Value	Max Value	Unit
FT551 (m3/h)	176	13.880000000000001	13.880000000000001	0.53000000000000004	12.810000000000001	15.000000000000001	m3/h
PT03 (mbar)	176	30.900000000000002	30.900000000000002	0.10000000000000001	30.800000000000001	31.000000000000001	mbar
LT01 (cm)	176	58.290000000000004	58.290000000000004	1.0100000000000001	57.280000000000001	59.300000000000001	cm
CV551 (%)	176	80.000000000000004	80.000000000000004	0.00000000000000004	80.000000000000001	80.000000000000001	%
CV03 (%)	176	30.000000000000004	30.000000000000004	0.00000000000000004	30.000000000000001	30.000000000000001	%
CV04 (reg)	176	0.00000000000000004	0.00000000000000004	0.00000000000000004	0.00000000000000001	0.00000000000000001	reg
CV01 (%)	176	0.00000000000000004	0.00000000000000004	0.00000000000000004	0.00000000000000001	0.00000000000000001	%
HL (W)	176	14.850000000000001	14.850000000000001	0.56000000000000004	13.250000000000001	16.410000000000001	W

# Possible leak: Thermal shield to Insulation Vacuum



PT71 (red) is a insulation vacuum, green – LN2 inlet of CM,  
Blue – LN2 outlet of CM, Orange, LHe inlet of CM