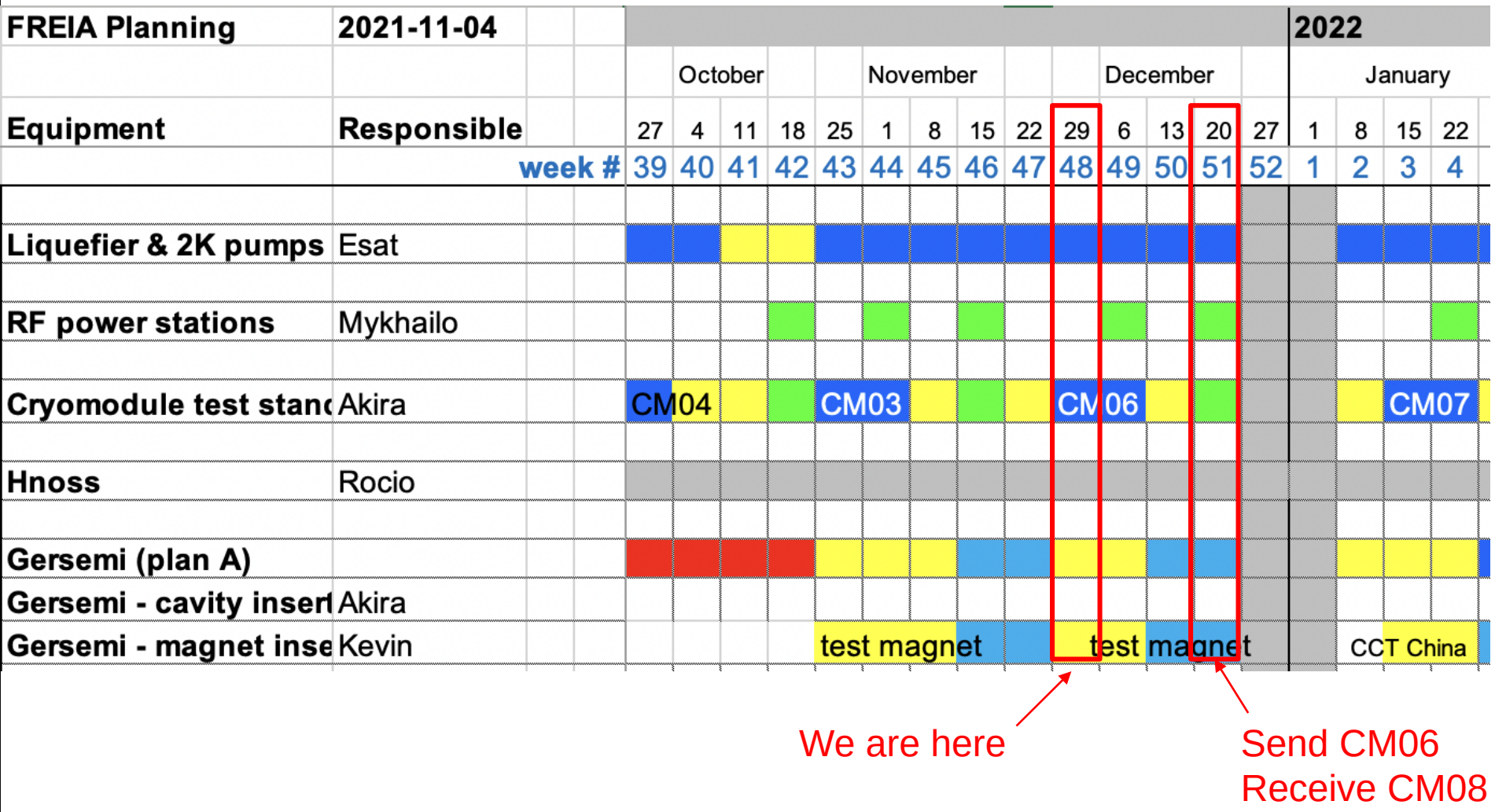
UPPSALA
UNIVERSITET

ESS weekly meeting (2021 W48)

A. Miyazaki et al.

General planning



- CM06 is under cold test
- We are preparing for the next magnet test in parallel

W47 & W48 progress

week		W47											
date		MON		TUE		WED		THU		FRI		SAT	SUN
		22-nov		23-nov		24-nov		25-nov		26-nov		27-nov	28-nov
		m	a	m	a	m	a	m	a	m	a		
present CM	**CM06**	Beckhoff motor driver test									N2 cooling		
next CM	**CM07**					reception test LEMO				waiting in the docking area			
next next CM	**CM08**	preparation at Orsay											

week		W48											
date		MON		TUE		WED		THU		FRI		SAT	SUN
		29-nov		30-nov		01-dec		02-dec		03-dec		04-dec	05-dec
		m	a	m	a	m	a	m	a	m	a		
present CM	**CM06**	cooling down	4K filling		2K pumping, coupler cold conditioning, RF calibration	crain training	MP conditioning	CTS test at 2K	heat load measurement	piezo test	f vs p from 2K to 4K		
next CM	**CM07**	waiting in the docking area											
next next CM	**CM08**	preparation at Orsay											

We are here

- We started N2 cooling earlier than usual
- Insulation vacuum in transfer line (Dewar to VBox) was pumped again

W49 & W50 & W51 planning

week		W49																	
date		MON		TUE		WED		THU		FRI		SAT		SUN					
		06-dec		07-dec		08-dec		09-dec		10-dec		11-dec		12-dec					
		m	a	m	a	m	a	m	a	m	a								
present CM	**CM06**	start warming up		vent insulation vacuum		warming up		disconnect cryogenic lines	swap modules	filling dry N2									
next CM	**CM07**	VNA reception test, doorknob mounting						water leak check		connect cryogenic lines	beam pumps, leak check								
next next CM	**CM08**	preparation at Orsay																	

week		W50																	
date		MON		TUE		WED		THU		FRI		SAT		SUN					
		13-dec		14-dec		15-dec		16-dec		17-dec		18-dec		19-dec					
		m	a	m	a	m	a	m	a	m	a								
previous CM	**CM06**	doorknob dismounting	outgoing test (LEMO, VNA) shock sensors	activate shock sensors, close the box		waiting in the box		**departure to ESS**		**arrival at ESS**									
present CM	**CM07**	beam vacuum pumping				RF calibration													
next CM	**CM08**	preparation at Orsay								departure from Orsay		transport over the sea							

Try to make it with the same track

week		W51																	
date		MON		TUE		WED		THU		FRI		SAT		SUN					
		20-dec		21-dec		22-dec		23-dec		24-dec		25-dec		26-dec					
		m	a	m	a	m	a	m	a	m	a								
previous CM	**CM06**	preparation of documents						publish test report											
present CM	**CM07**	coupler warm conditioning																	
next CM	**CM08**	transport over the sea						~~**reception at UU morning**~~		thermalization at UU									

Sets of equipment at Uppsala

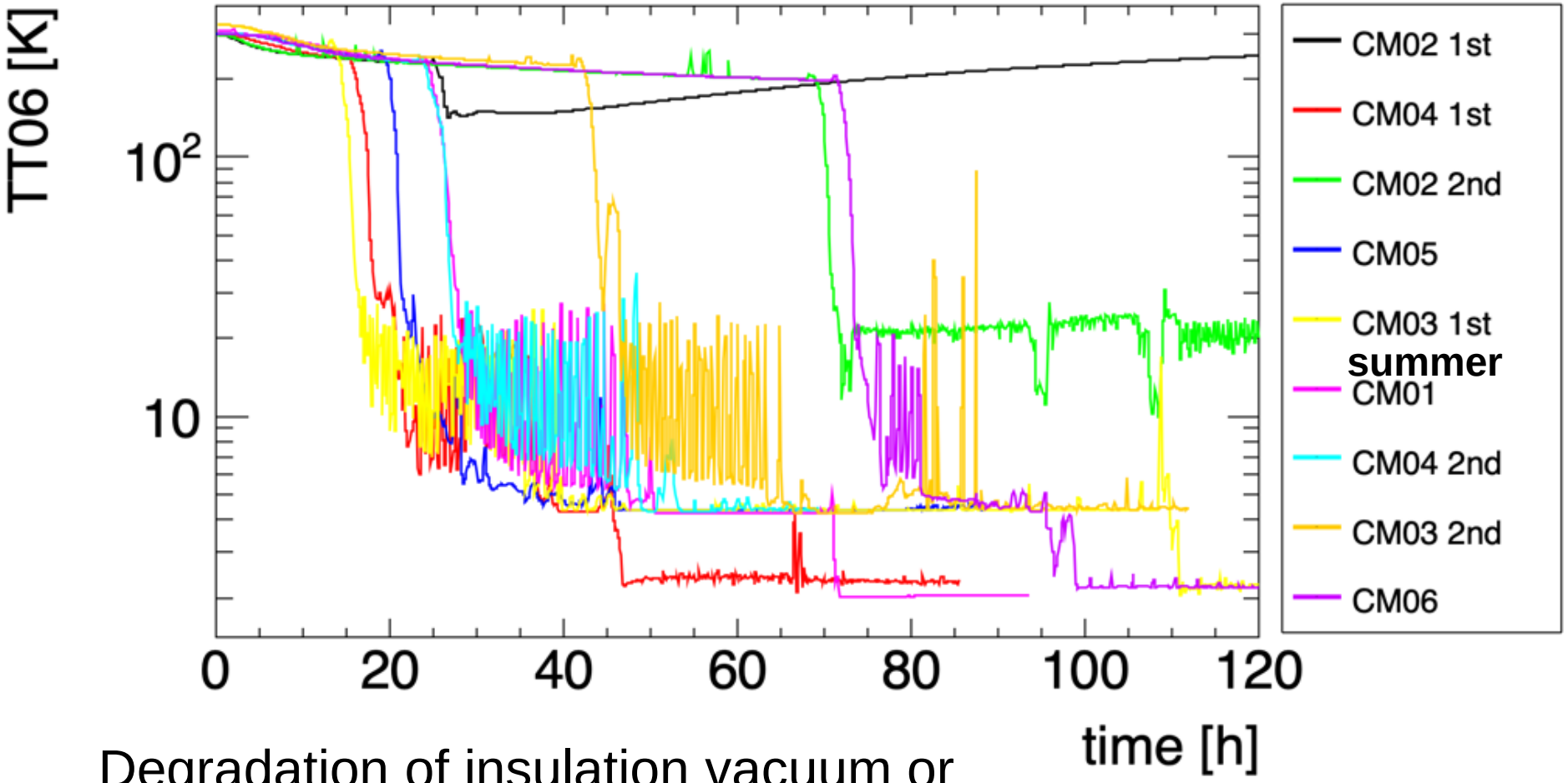
- We are using **two frames** for parallel work
- We are using **two sets of feet** for two frames
  - The feet coming with CM02
  - Other feet coming with CM04
- Other **two sets of feet** are ready for shipping with the CMs under tests
  - The feet coming with CM06 (under test) are in the CM06 box
  - The feet coming with CM07 (next test) are in the CM07 box

→ In total **four set of feet** must be at Uppsala

- **Two sets of cryogenic bellows** are at Uppsala
  - The one with CM02 has been always in use
  - The one with CM04 is kept as spare
- Two sets of bellows are in CM06 & CM07 boxes
- **Two sets of prototype doorknobs** are in use at Uppsala

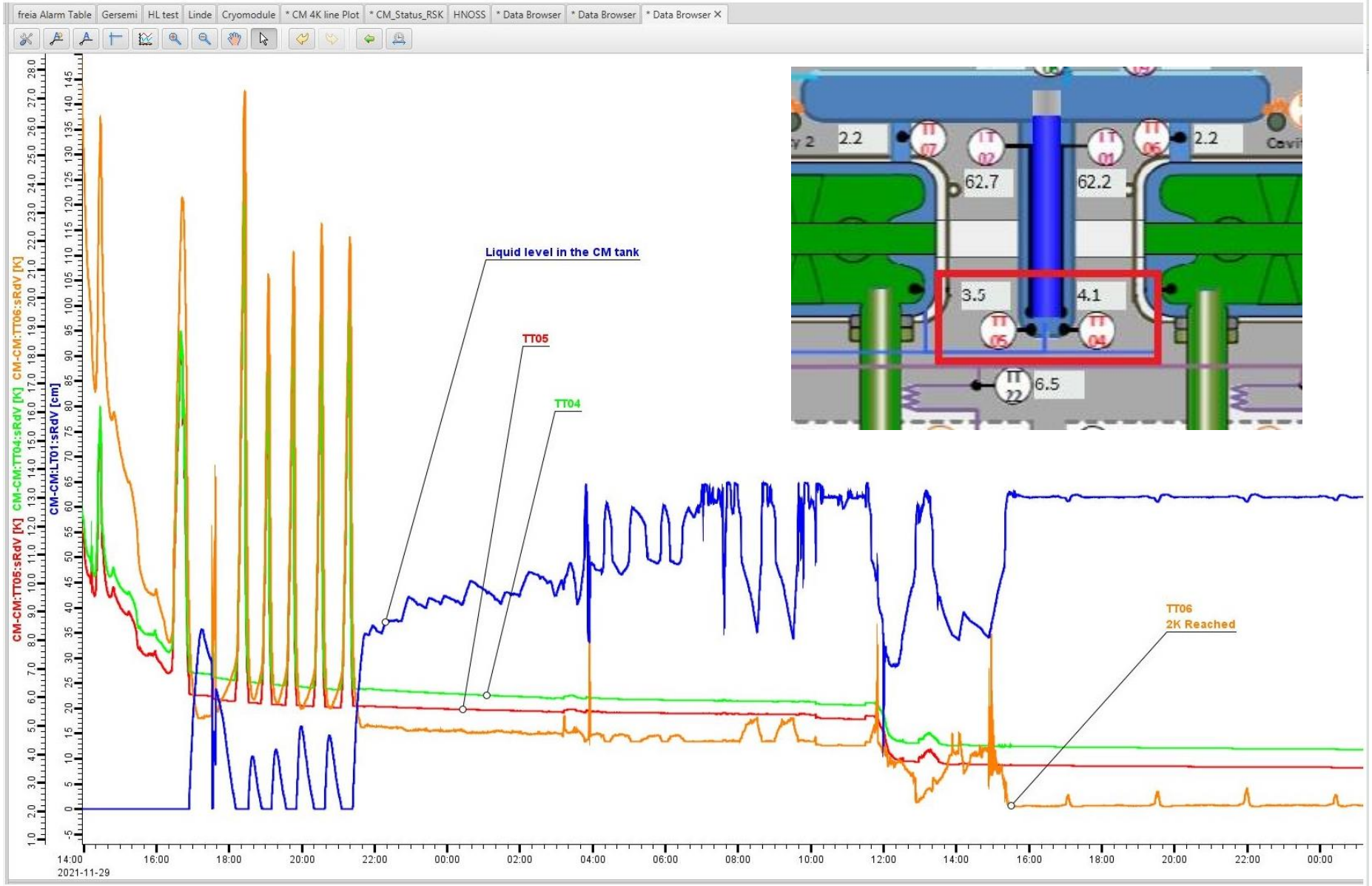
Instability during cooling down

Does longer N2 cooling help LHe filling? → not very clear

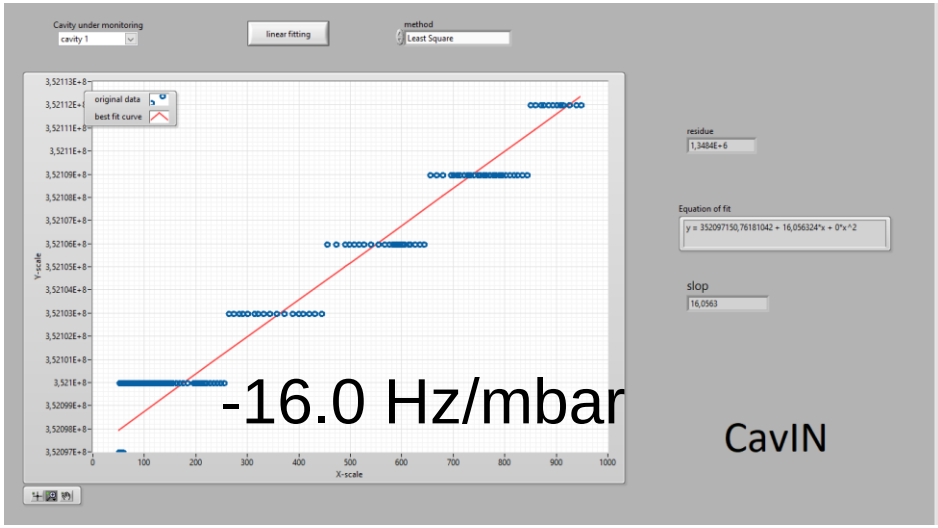


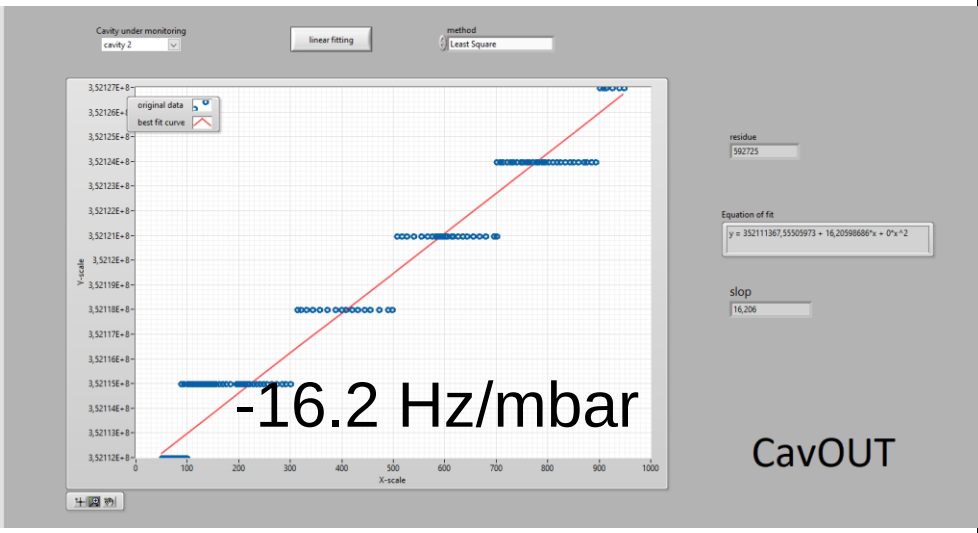
Degradation of insulation vacuum or different parameters in cryogenics?

Doubt in TT04 and TT05

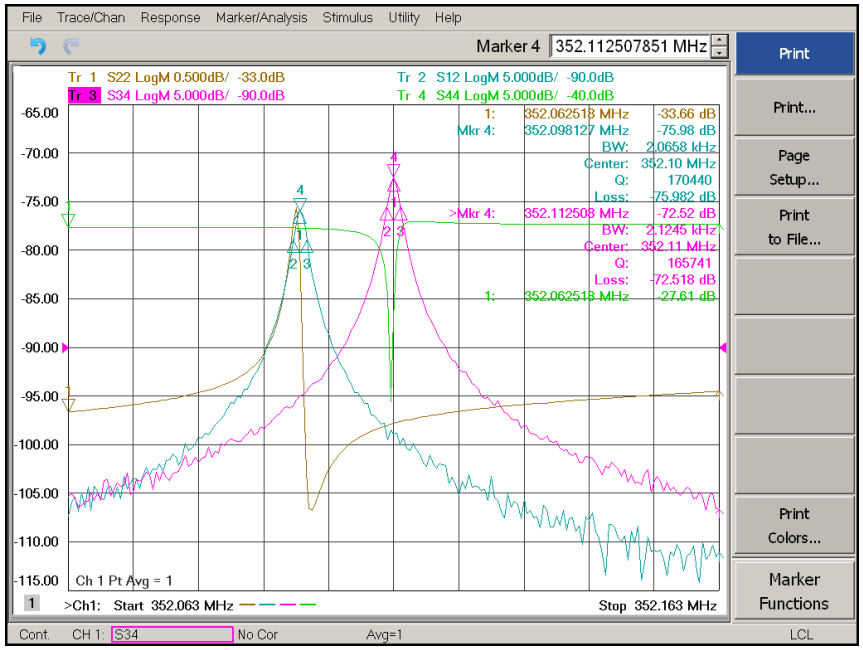


CM06: f vs p during 2K pumping





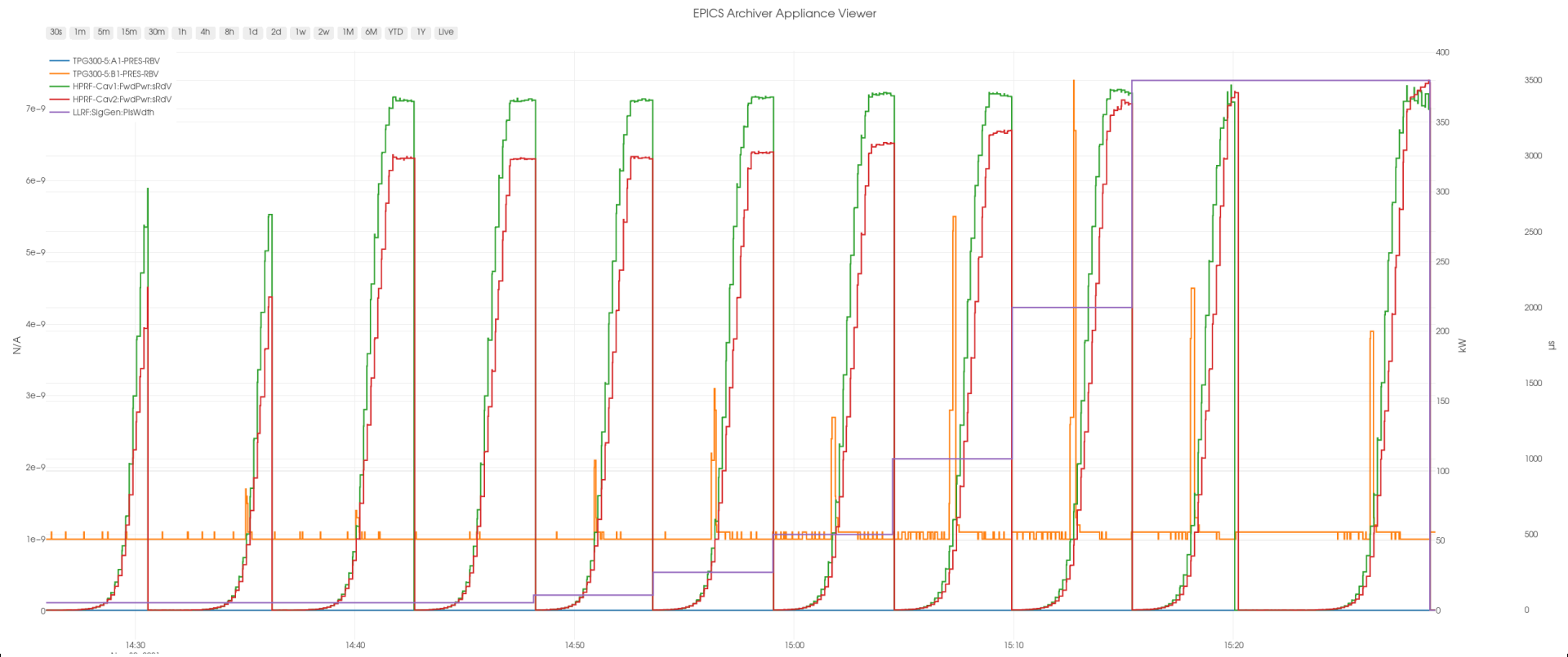
The span was not optimized → we redo this during warming up from 2K to 4K



	CAV IN	CAV OUT
f_0 [MHz]	352.098	352.113
QL	1.70e5	1.66e5

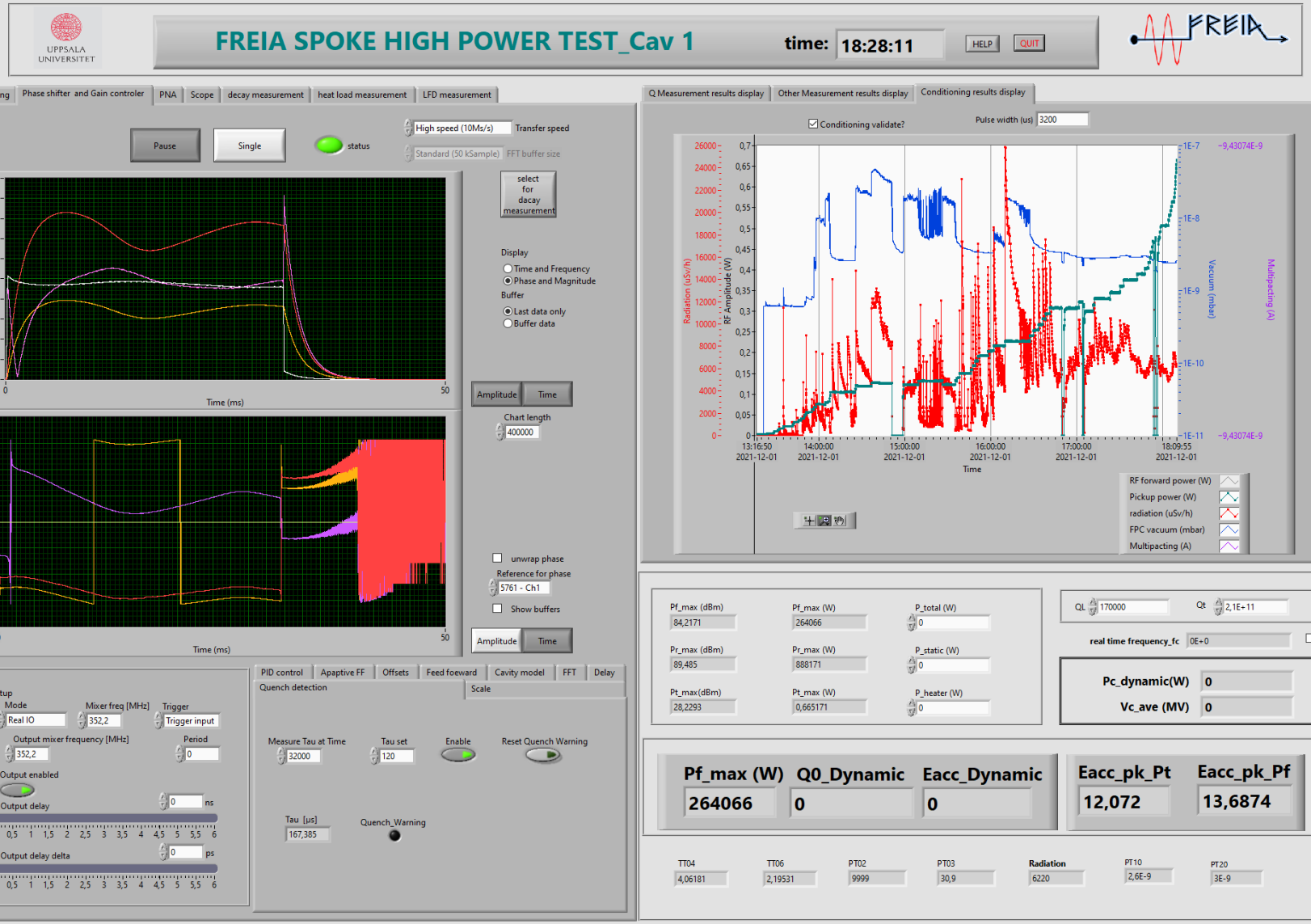
- Again (like CM02, CM04 1st, CM05), the power couplers are too much coupled
- Spec. is **>1.74e5**

CM06: coupler cold conditioning



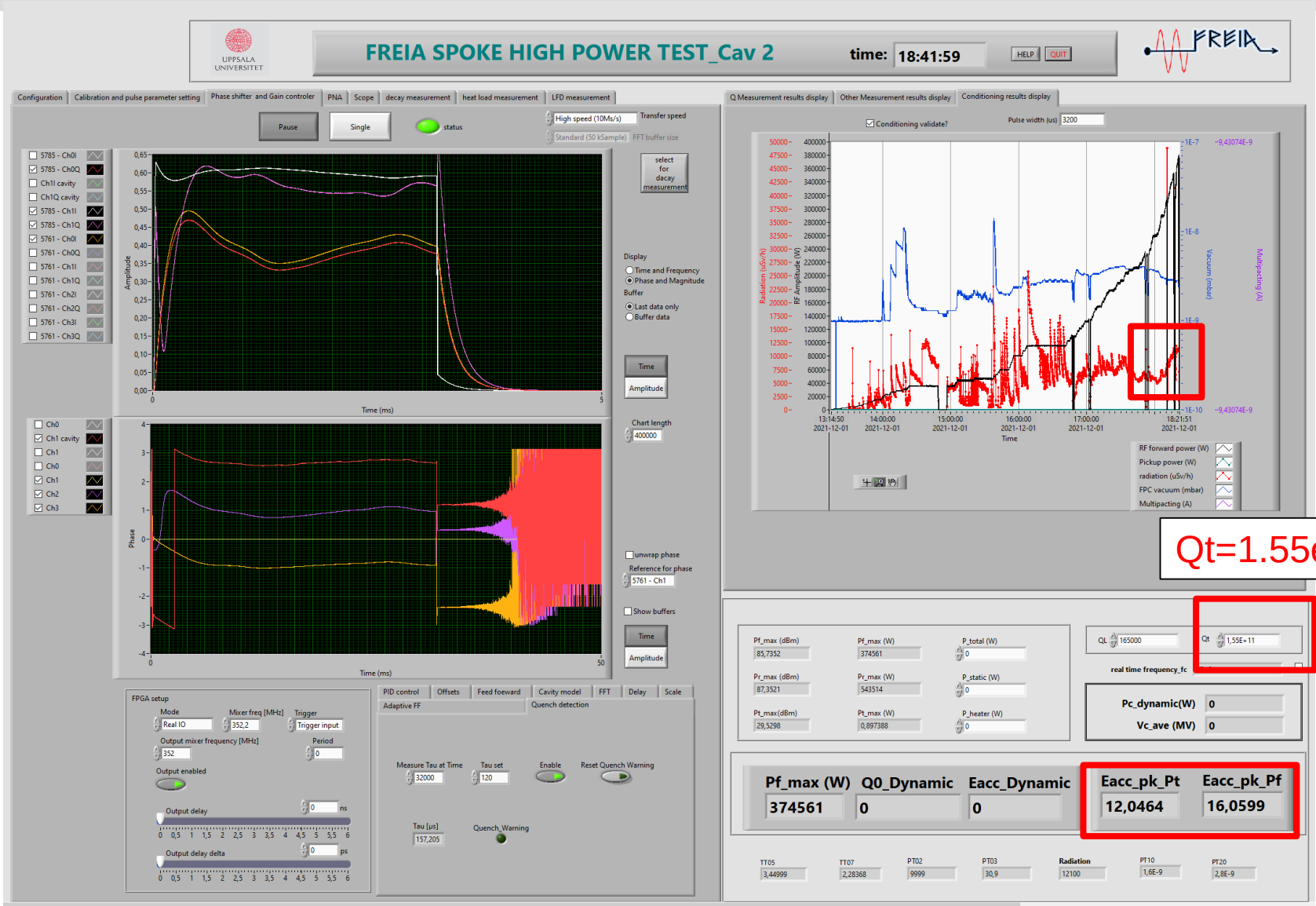
No problem
(Is this really necessary by the way?)

CM06: CAV IN reached 12 MV/m



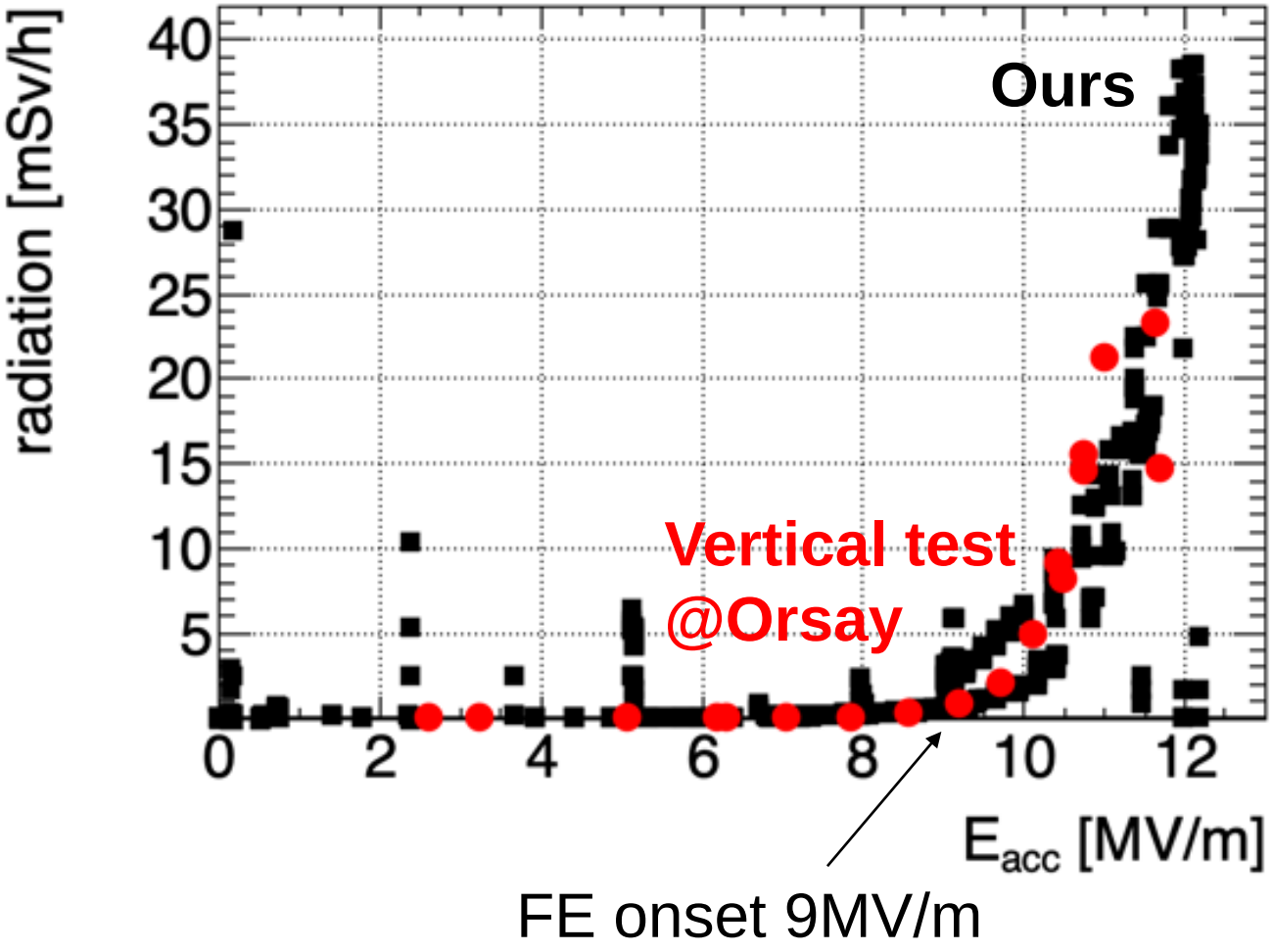
No exponential increase of X-rays → no FE up to 12MV/m

CM06: CAV OUT reached 12 MV/m (?)

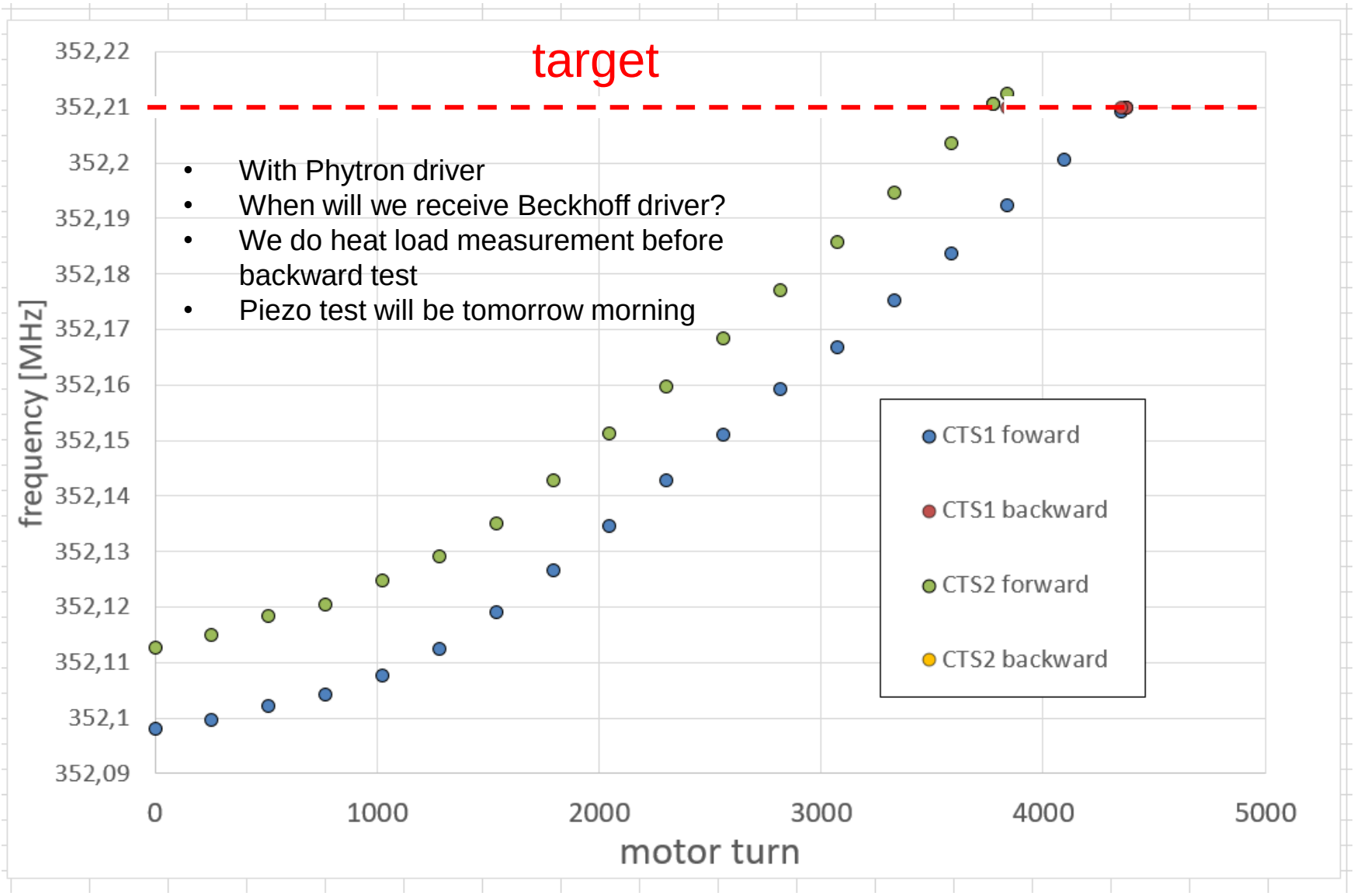


X-rays increased by Eacc but doubt in Qt (like CM05) so the real field might be higher than usual, confirmed with bigger LFD

CM06 CAV OUT: Comparison to vertical test



CM06: CTS reached 352.21 MHz



- With Phytron driver
- When will we receive Beckhoff driver?
- We do heat load measurement before backward test
- Piezo test will be tomorrow morning

CM07: reception test

- LEMOs OK
- Pt100 & heaters OK

Cables verification CM07 at IJCLab — v1

Socket assembly — Verified by : M. Pierens

Socket name	Sensor / Actuator type	PID name	Serial number	Electrical value (Ω) (before shipping)	C / NC
LC01	Cernox	TT04	X138089	65,54	C
	Cernox	TT05	X138356	76,23	C
	Cernox	TT06	X138355	68,17	C
	Cernox	TT07	X138087	68,27	C
	Cernox	TT08	X139133	66,68	C
	Cernox	TT09	X138088	68,62	C
	PT100	TT10	PT27	107,77	C
	PT100	TT11	PT33	107,8	C
	Cernox	TT12	X137124	74,59	C
	PT100	TT20	PT44	107,78	C
	PT100	TT21	PT54	107,78	C
	Cernox	TT22	X137123	76,21	C
PT Coupler	PT100	TT120	PTC23	107,65	C
		TT220	PTC30	107,64	C
LC02	Heaters	EH01	EH19	84,23	C
		EH02	EH20	83,55	C
		EH10		82,99	C
		EH20		84,62	C
LC03	Motor sensor	SM10		2,44 (AB) / 2,47 (CD)	C
	a limit sensor	LS10		2,1	C
	Motor sensor	SM20		2,52 (AB) / 2,57 (CD)	C
	a limit sensor	LS20		2,19	C
LC07	Liquid Helium Level Sensor	LT01	7340	368,68	C
		LT02	7342	369,16	C
Socket name	**Sensor / Actuator type**	**PID name**	**Serial number**	**Electrical value (µF) (before shipment)**	**C / NC**
LC04	Actuators	PZ10		12,38	C
		PZ11		12,5	C
		PZ20		12,46	C
		PZ21		12,24	C

Cables verification CM07 at UU — v1

Socket assembly — Verified by :

Socket name	Sensor / Actuator type	PID name	Serial number	Electrical value (Ω) (before shipping)	C / NC
LC01	Cernox	TT04	X138089	65,15	C
	Cernox	TT05	X138356	75,75	C
	Cernox	TT06	X138355	68,2	C
	Cernox	TT07	X138087	67,9	C
	Cernox	TT08	X139133	66,45	C
	Cernox	TT09	X138088	68,2	C
	PT100	TT10	PT27	107,05	C
	PT100	TT11	PT33	106,75	C
	Cernox	TT12	X137124	75,05	C
	PT100	TT20	PT44	106,85	C
	PT100	TT21	PT54	106,9	C
	Cernox	TT22	X137123	76,2	C
PT Coupler	PT100	TT120	PTC23	107,9	C
		TT220	PTC30	107,9	C
LC02	Heaters	EH01	EH19	84,1	C
		EH02	EH20	83,4	C
		EH10		83	C
		EH20		84,6	C
LC03	Motor sensor	SM10		2.4 /2.4	C
	a limit sensor	LS10		2	C
	Motor sensor	SM20		2.3 / 2.4	C
	a limit sensor	LS20		2	C
LC07	Liquid Helium Level Sensor	LT01	7340	367,1	C
		LT02	7342	367,5	C
Socket name	**Sensor / Actuator type**	**PID name**	**Serial number**	**Electrical value (µF) (before shipment)**	**C / NC**
LC04	Actuators	PZ10		14,2	C
		PZ11		14,05	C
		PZ20		14,22	C
		PZ21		14,5	C

- No time for VNA measurement
  → next week just before doorknob mounting

Cav_IN [Ohm]			Cav_OUT [Ohm]		
1-2			1-2		
1-3			1-3		
1-4	107.9	TT120	1-4	107.9	TT220
2-3			2-3		
2-4			2-4		
3-4			3-4		
Heater	3.4	EH12	Heater	3.2	EH220

Outcome from a meeting with THALES

- Some questions to THALES → another technical meeting on Dec 9th 10h
  - The origin of G1-G2 burn mark
  - Future visit of THALES technical team to Uppsala
  - Test procedure?
- ESS-THALES meeting on Feb 3rd
  - No decision yet about 52 (+2-3) spares
  - Delivery time of 9 months in such a mass production
  - This is not an option for Uppsala! (Feb + 9 months = Nov 2022!)
- We found a backdoor for small number of spares
  - 1st unit can be shipped within a couple of days (on stock),
  - 2nd unit can be shipped T0+3 months (→ Feb + 3 month = May)

- According to the statistics, the tubes will start to trip from April and will die in summer → the 2 spare tubes after February sound reasonable