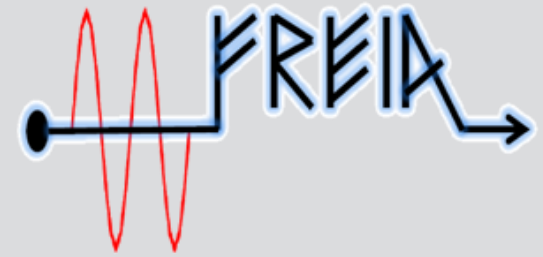




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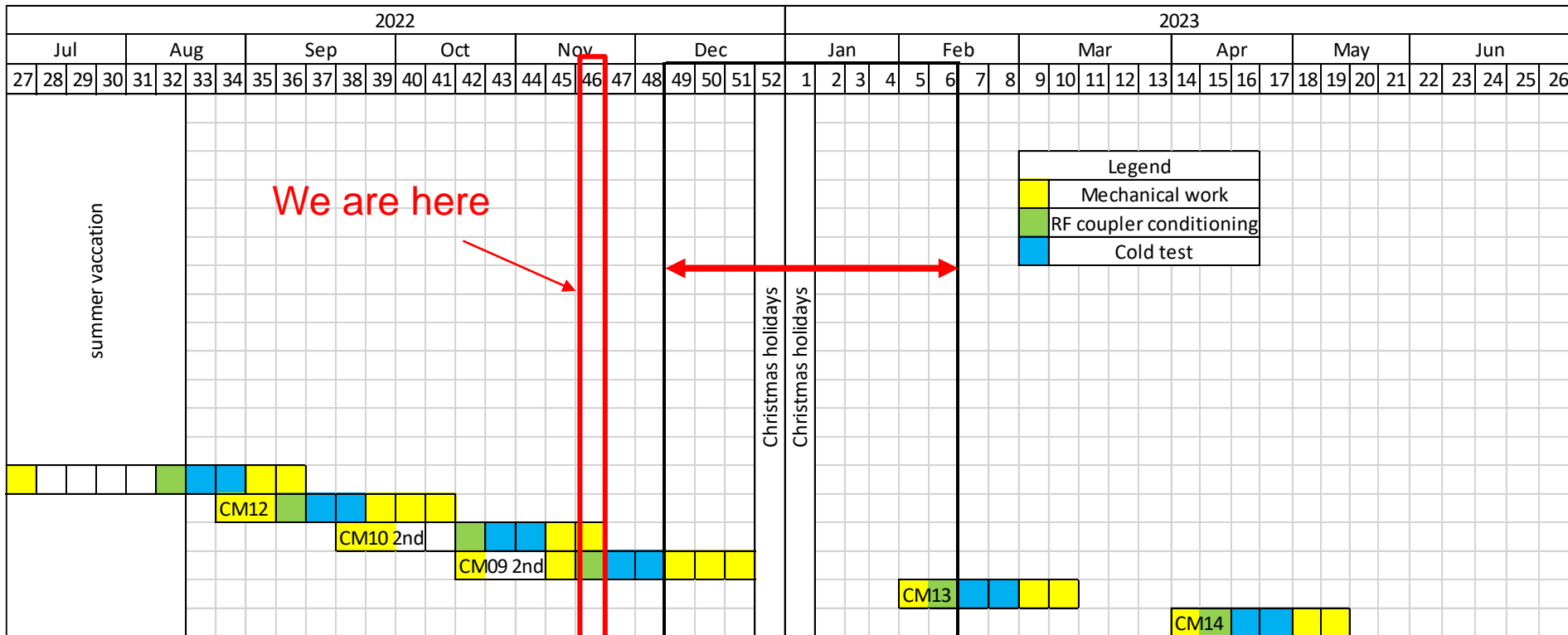


ESS weekly meeting (2022 W46)

A. Miyazaki et al



Global planning

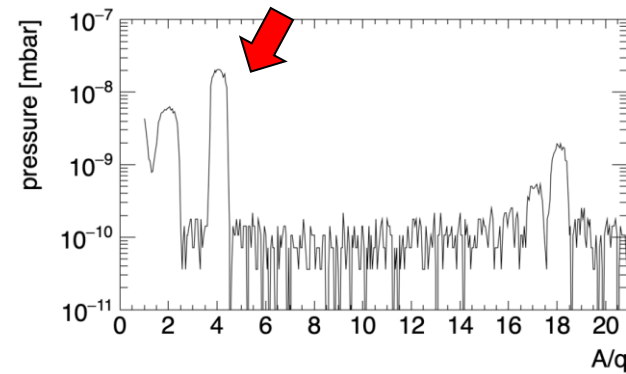
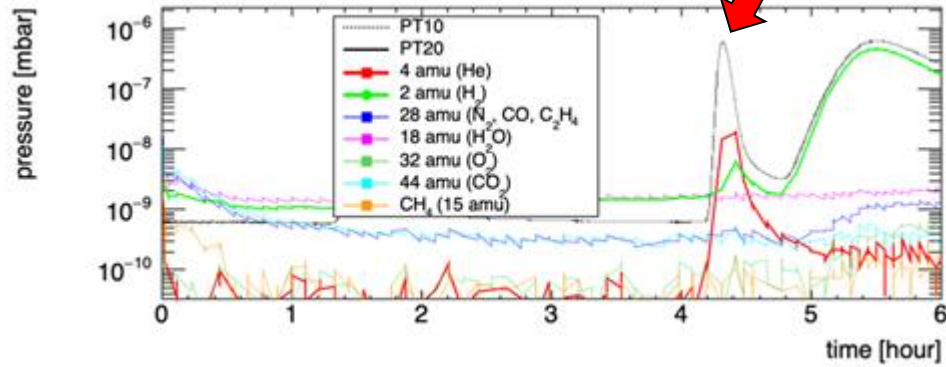


- CM12 cold leak test in December or January
 - Can ESS send CM12 to FREIA in W48 such that we can reuse the shock sensors to transport CM09 to ESS in W50?
- FREIA may perform CERN cavity testing either in December or January
 - We may be able to flexibly select which will be the first

Discussion: helium-like signal ($A/q=4$)



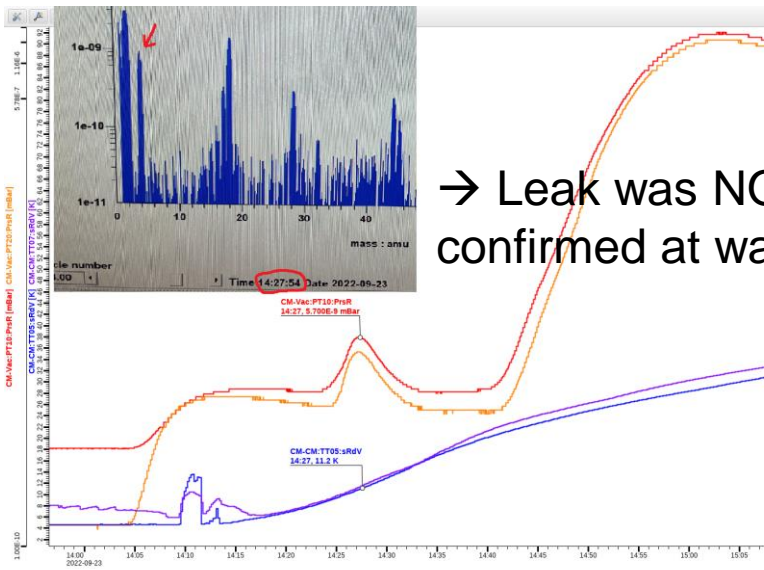
CM09 1e-6 mbar by Penning



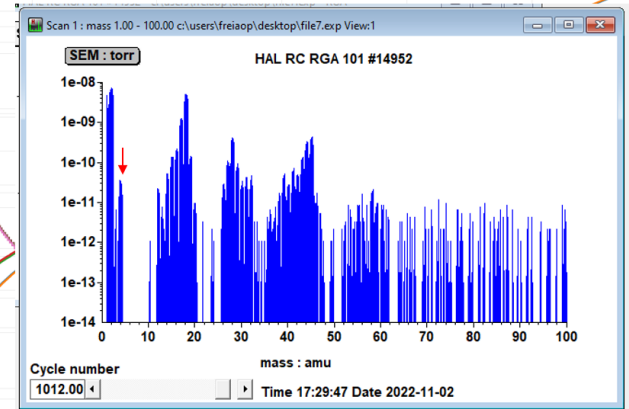
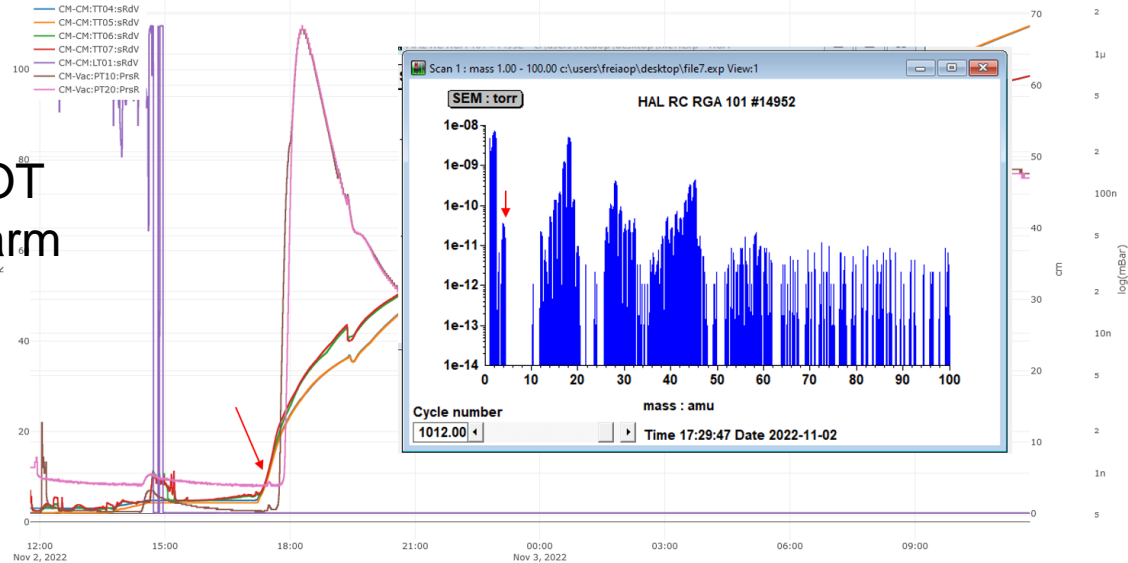
→ Leak was confirmed at warm

CM12 6e-9 mbar by Penning

CM10_2 6e-10 mbar by Penning

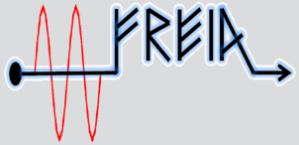


→ Leak was NOT confirmed at warm



We will cool down CM12 again and try leak test with Artur

CM10_2 & CM09: progress and planning



week		W45											
date		MON 07-nov		TUE 08-nov		WED 09-nov		THU 10-nov		FRI 11-nov		SAT 12-nov	SUN 13-nov
		m	a	m	a	m	a	m	a	m	a		
present CM	CM10	Disassemble concrete wall		disconnect lines		Swap the modules		disconnect doorknobs					
next CM	CM09	waiting in th docking area						connect waveguides, cryogenic lines		connect vacuum pumps		vacuum pumping	

We are here

week		W46											
date		MON 14-nov		TUE 15-nov		WED 16-nov		THU 17-nov		FRI 18-nov		SAT 19-nov	SUN 20-nov
		m	a	m	a	m	a	m	a	m	a		
previous CM	CM10		N2 filling	Outgoing test		departure to ESS		report writing		publish report			
present CM	CM09	prepare power stations, RF calibrations				coupler conditioning at warm						LN2 cooling	

week		W47											
date		MON 21-nov		TUE 22-nov		WED 23-nov		THU 24-nov		FRI 25-nov		SAT 26-nov	SUN 27-nov
		m	a	m	a	m	a	m	a	m	a		
present CM	CM09	start LHe cooling		4K filling	2 K pumping	calibration and interlock setup		CTS tests		MP conditioning			

week		W48											
date		MON 28-nov		TUE 29-nov		WED 30-nov		THU 01-dec		FRI 02-dec		SAT 03-dec	SUN 04-dec
		m	a	m	a	m	a	m	a	m	a		
present CM	CM09	heat load measurement				start warming up		vent insulation vacuum		warming up / concrete blocks open			

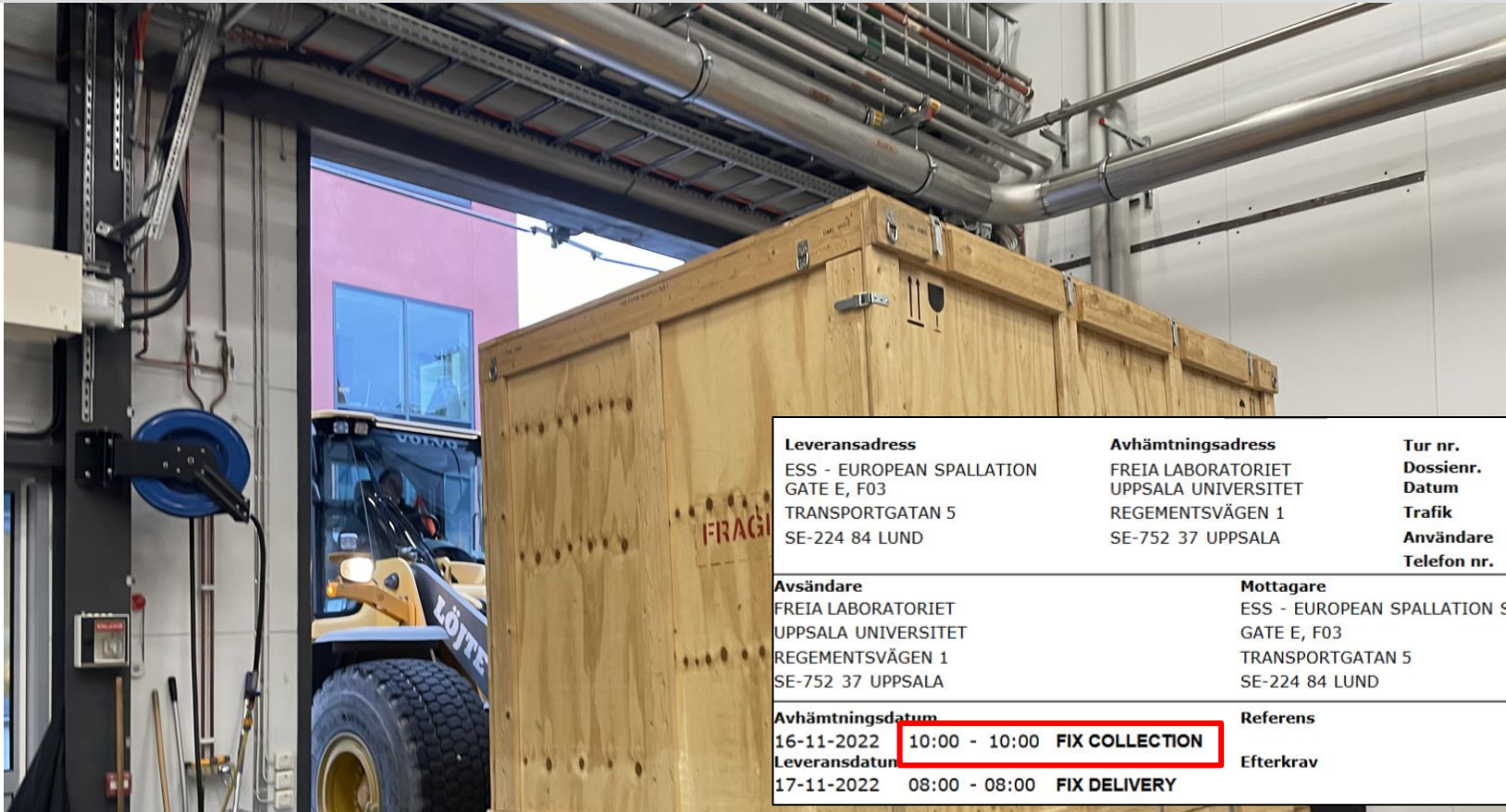
week		W49											
date		MON 05-dec		TUE 06-dec		WED 07-dec		THU 08-dec		FRI 09-dec		SAT 10-dec	SUN 11-dec
		m	a	m	a	m	a	m	a	m	a		
present CM	CM09	warming up completed	disconnect lines				N2 filling		out-going test				

Goal of CM09

week		W50											
date		MON 12-dec		TUE 13-dec		WED 14-dec		THU 15-dec		FRI 16-dec		SAT 17-dec	SUN 18-dec
		m	a	m	a	m	a	m	a	m	a		
present CM	CM09	departure to ESS		report writing				report published					



Departure of CM10_2



Leveransadress ESS - EUROPEAN SPALLATION GATE E, F03 TRANSPORTGATAN 5 SE-224 84 LUND	Avhämtningsadress FREIA LABORATORIET UPPSALA UNIVERSITET REGEMENTSVÄGEN 1 SE-752 37 UPPSALA	Tur nr. 22E 94 11 5023 Dossienr. 22E 94 11 5023 - 2 Datum 10-11-2022 Trafik 301 Användare Oscar Struve Telefon nr. +46 (0)42-495 00 73
Avsändare FREIA LABORATORIET UPPSALA UNIVERSITET REGEMENTSVÄGEN 1 SE-752 37 UPPSALA	Mottagare ESS - EUROPEAN SPALLATION SOURCE GATE E, F03 TRANSPORTGATAN 5 SE-224 84 LUND	
Avhämtningsdatum 16-11-2022	Referens 10:00 - 10:00 FIX COLLECTION	Dragbil Trailer
Leveransdatum 17-11-2022	Efterkrav 08:00 - 08:00 FIX DELIVERY	

Minor miscommunication with the company

- The appointment was 10:00
 - We booked a forklift (external company) at 10:00
 - The truck driver arrived around 8:00 and called Elin (ESS) saying nothing was happening for two hours!
- Elin and I communicated and understood that it should be at 10:00



CM10_2 report will be published soon



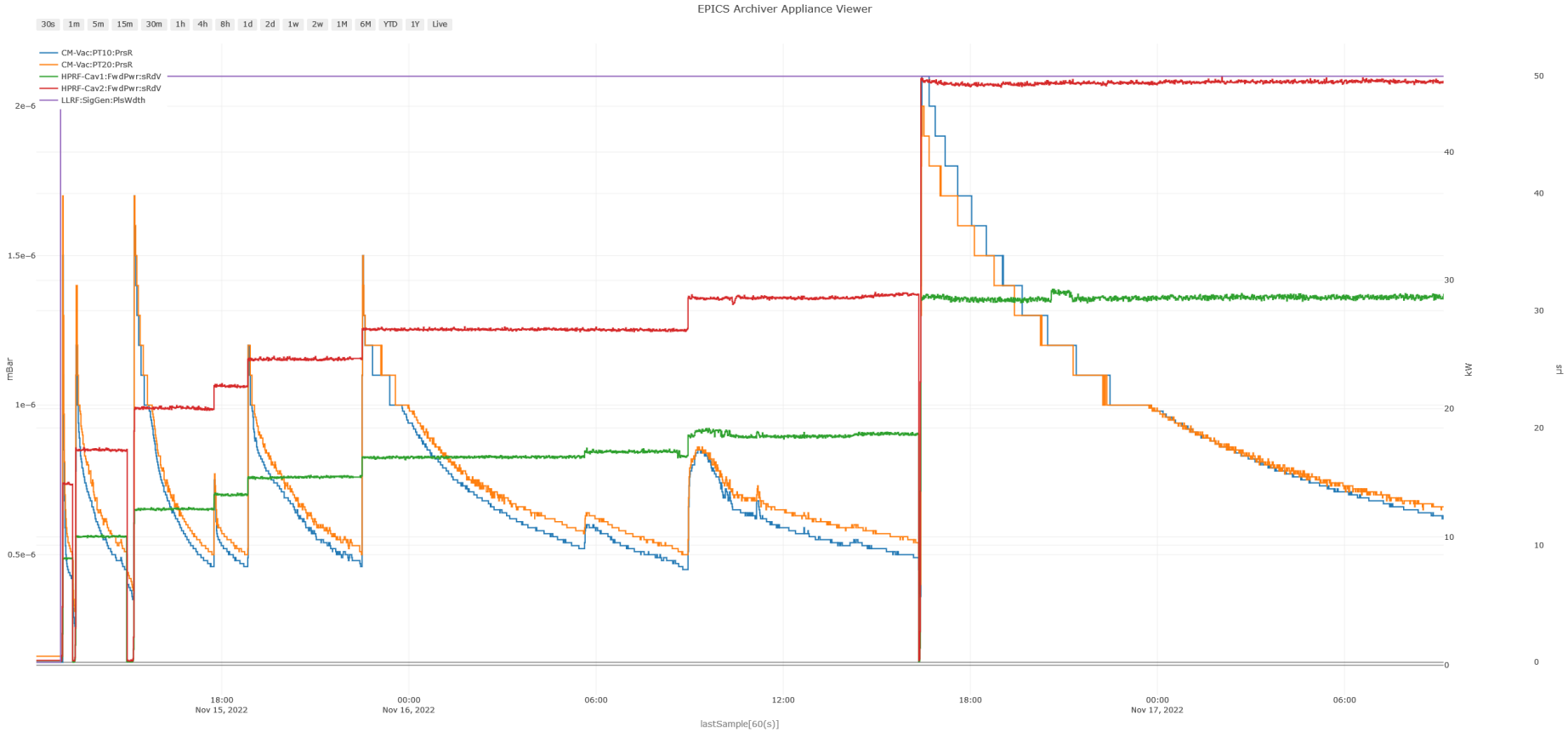
FREIA
Department of Physics and Astronomy
Uppsala University

Summary of CM10 2nd test

Report time: 20221117

Cryomodule						
Location	UU 2nd test					
Date	2022-09-29	2022-10-26		2022-11-15		
VNA model	Agilent PNA	Agilent PNA		Agilent PNA		
T° (C)	not recorded	2K		not recorded		
Pcavity (mbar)	3.50E-03	1.30E-09		UR		
Insulating vacuum (mbar)	PA	3.40E-07		PA		
Pcryolines (mbar)	PA	30.1		PA		
	RF measurements @ T=300K before testing		RF measurements @ T=2K during the test		RF measurements @ T=300K after testing	
Cavity location	Cavity IN	Cavity OUT	Cavity IN	Cavity OUT	Cavity IN	Cavity OUT
Cavit�	SPK-DSPK-17	SPK-DSPK-20	SPK-DSPK-17	SPK-DSPK-20	SPK-DSPK-17	SPK-DSPK-20
Coupler	SPK-CPL-23	SPK-CPL-24	SPK-CPL-23	SPK-CPL-24	SPK-CPL-23	SPK-CPL-24
Manchette	SPK-DWT-15	SPK-DWT-05	SPK-DWT-15	SPK-DWT-05	SPK-DWT-15	SPK-DWT-05
S11 (off resonance)	0,11	0,09			0,01	0,04
S11 (@ resonance)	-0,6	-0,63			-0,7	-0,68
S21 (@ resonance)	-83,61	-83,78	-75,86	-74,33	-83,82	-83,84
Frequency (MHz)	351,574	351,55			351,574	351,548
Frequency @ 2K (MHz)			352,125	352,098		
Shift (MHz)			-0,551	-0,548		
Bandwidth (kHz)	38,85	39,5	2,03	1,99	39,23	39,37
Qloaded	9050	8899	173361	176753	8962	8931
For information S11 pick-up cable (measurement @ reception)						
Cable Ref						
S11 pick-up cable (measurement on CM)	-1,845	-1,785	-0,99	-1,005	-1,82	-1,74
Qt (calculated)						
Qt (measurement in vertical test @ 2K)						
	Results (under coupled)		Results (over coupled)		Results (under coupled)	
S11 (corrected)	-0,7	-0,7	0,0	0,0	-0,7	-0,7
S21 (corrected)	-82,7	-82,9	-75,4	-73,8	-82,9	-83,0
xt (measured on CM @ 300K)	230602	223732			228360	224537
xt (measured on CM @ 2K)			173361	176753		
For information Qext (calculated with CST Studio)						
Qt (measured on CM)	2,67E+11	2,78E+11			2,75E+11	2,83E+11
Qt (measured on CM @ 2K)			2,39E+13	1,71E+13		
Qo	9420	9268			9328	9301
G (Ohm)	134	132			132	132

Performances		ATRIUM-433615	
		Date : 24/01/2022	
CM10 Configuration			
IN		OUT	
In cavity	SPK-DSPK-17	Out cavity	SPK-DSPK-20
Coupler	SPK-CPL-23	Coupler	SPK-CPL-24
Double wall tube	SPK-DWT-15	Double wall tube	SPK-DWT-05
Tuning System	SPK-TUN-12	Tuning System	SPK-TUN-13
	Specification or measured value @ Orsay (before shipping)	Measured values @ UU	C / NC
		Measured values @ UU 2nd	C / NC
		Measured values @ Lund	C / NC
External Q			
Cavity "IN"	1,75E+05+ OL<2,85E+05	1,83E+05	C
Cavity "OUT"	1,75E+05+ OL<2,85E+05	1,85E+05	C
Frequency min @ 2K (tuning system OFF)			
Cavity "IN"	MHz	>352,089 <352,175	352,124
Cavity "OUT"	MHz	>352,089 <352,175	352,096
Eacc max			
Cavity "IN"	MV/m	≤12	12
Cavity "OUT"	MV/m	≤12	11,6
Heat losses			
Static losses (RF OFF)	W	<8	17,29 +/- 1,21
Dynamic losses (RF ON, Eacc=20MV/m)	W	<13	not measured
Pressure sensitivity			
Cavity "IN"	Hz/mbar	<20	13,3
Cavity "OUT"	Hz/mbar	<20	16,2
Lorenz forces detuning factor			
Cavity "IN"	Hz/(MV/m) ²	>-8	-3,333333333
Cavity "OUT"	Hz/(MV/m) ²	>-8	-4,320867654
Tuning sensitivity			
Cavity "IN"	Hz/step	0,145 +/- 0,027	0,176
Cavity "OUT"	Hz/step	0,145 +/- 0,027	not measured
Piezo detuning for K1=3 Hz/(MV/m) ²			
Cavity "IN"	Hz	>640	1318
Cavity "OUT"	Hz	>640	1297
Vacuum			
Insulation vacuum	mbar		3,40E-07
Beam vacuum (coupler gauge of Cavity "IN")	mbar	<10 ⁻⁴	8,90E-10
Beam vacuum (coupler gauge of Cavity "OUT")	mbar	<10 ⁻⁴	1,30E-09



We hope that we can finish conditioning tomorrow and will start N2 cooling over the weekend