

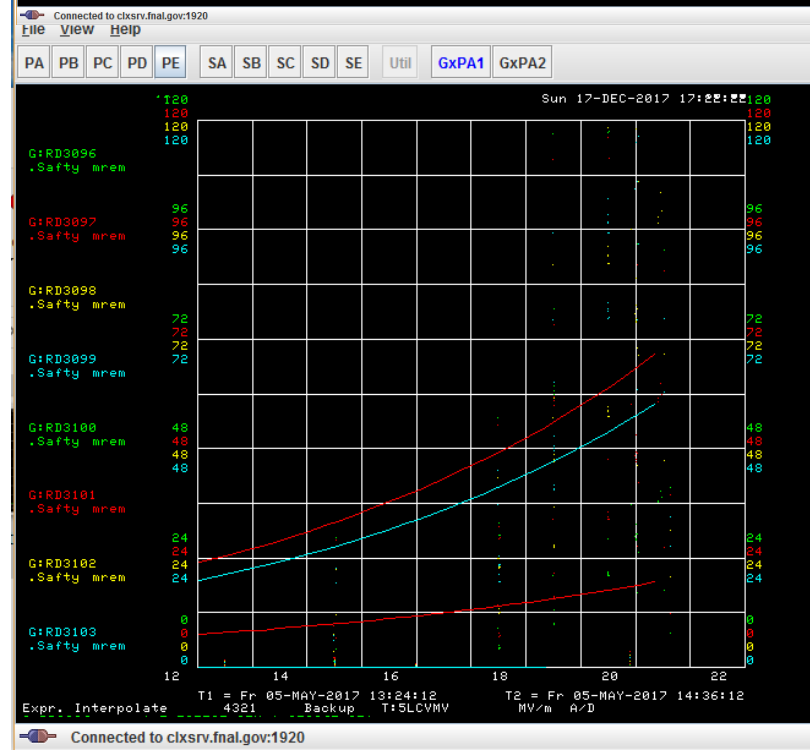
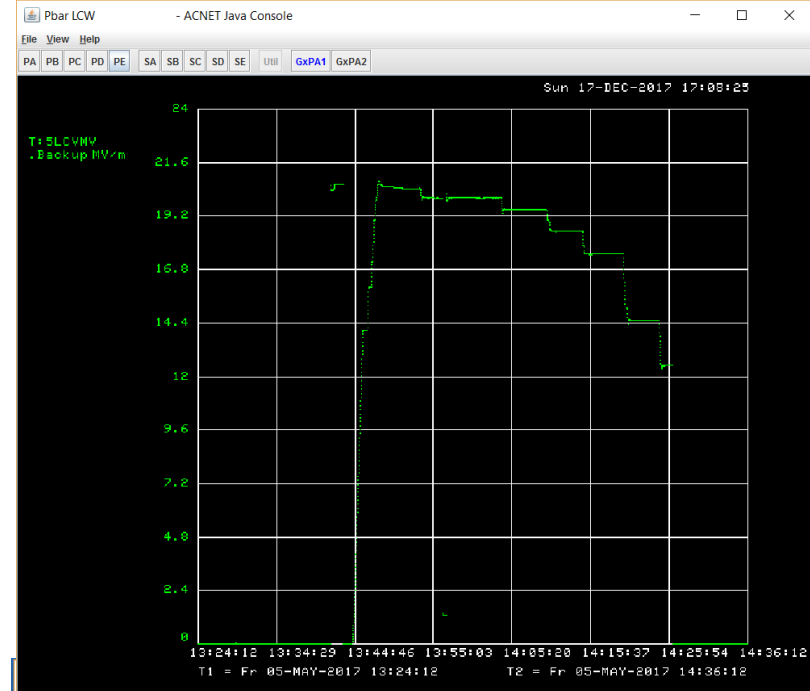
F1.3-02

Cavity		CMTF Gradient		
Cavity ID	Cavity Serial #	Max Gradient [MV/m]	Usable Gradient* [MV/m]	FE onset [MV/m]
F1.3-02-1	CAV0008	21	20.5	21
F1.3-02-2	CAV0003	21	21.0	No
F1.3-02-3	CAV0006	21	21.0	No
F1.3-02-4	CAV0007	21	21.0	No
F1.3-02-5	CAV0016	21	18.2	12.5
F1.3-02-6	CAV0013	16.86	16.5	No
F1.3-02-7	CAV0011	21	20.5	17.5
F1.3-02-8	CAV0015	21	21.0	No

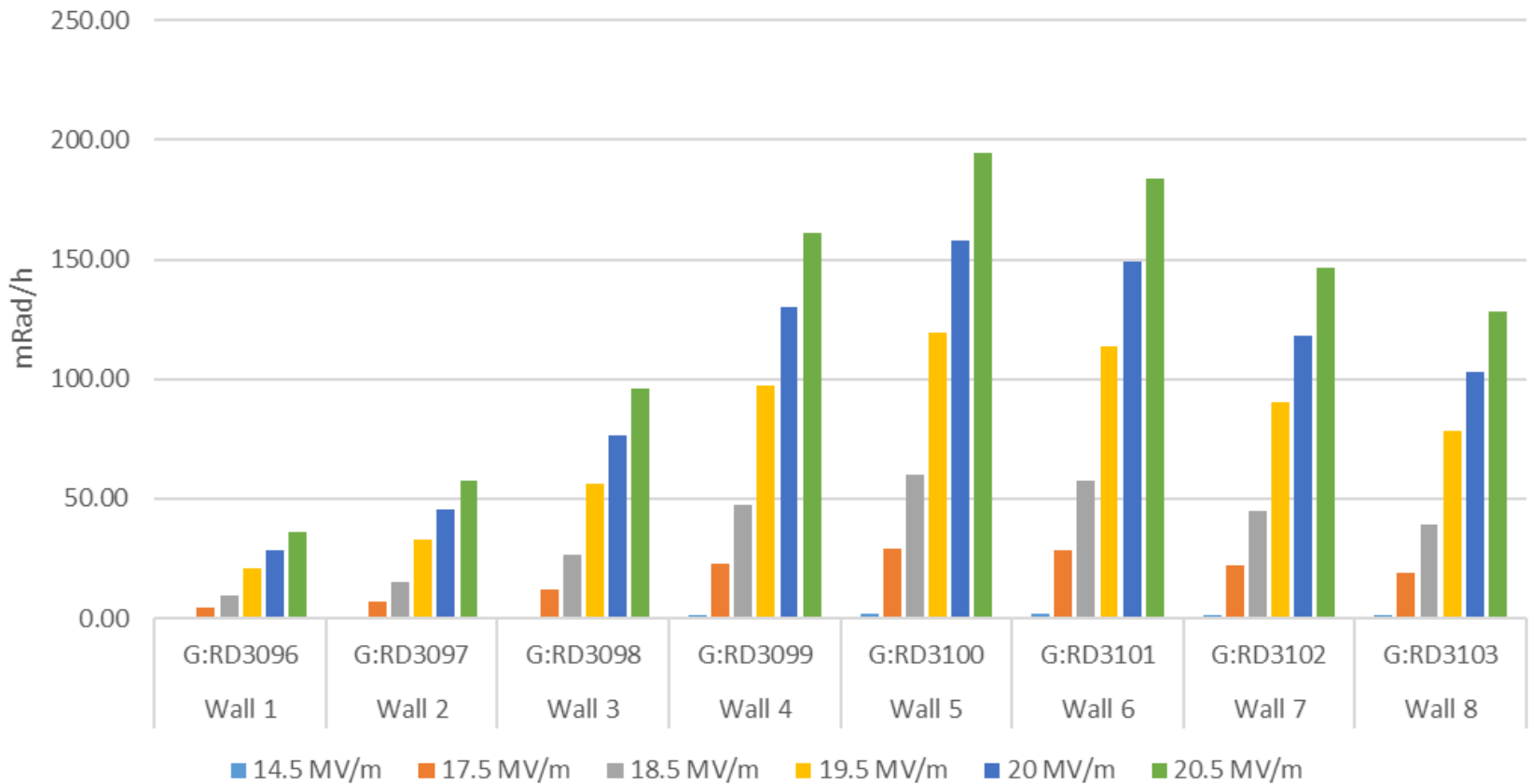
F1.3-02

Cavity 5

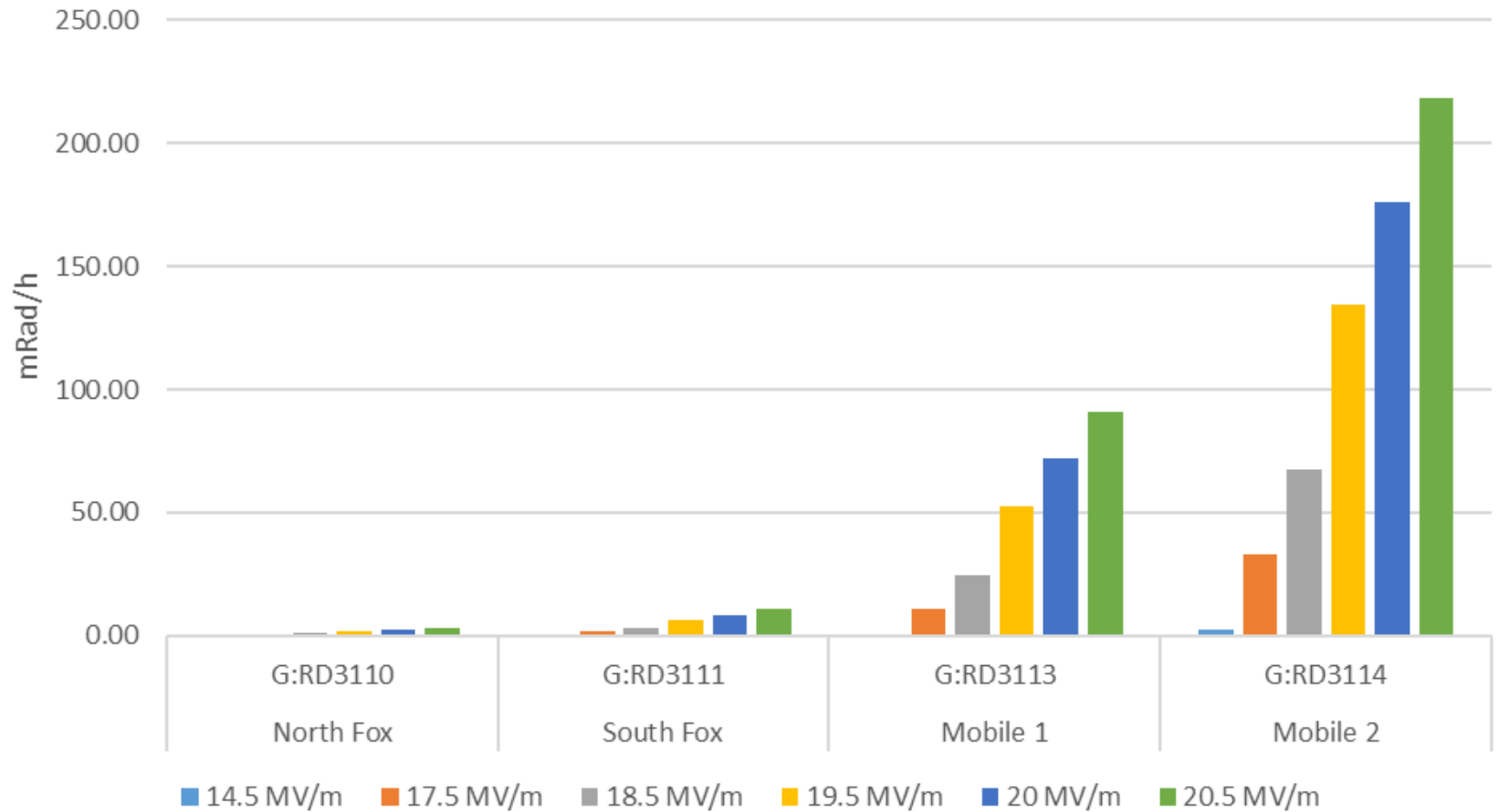
Fr-5-May-17



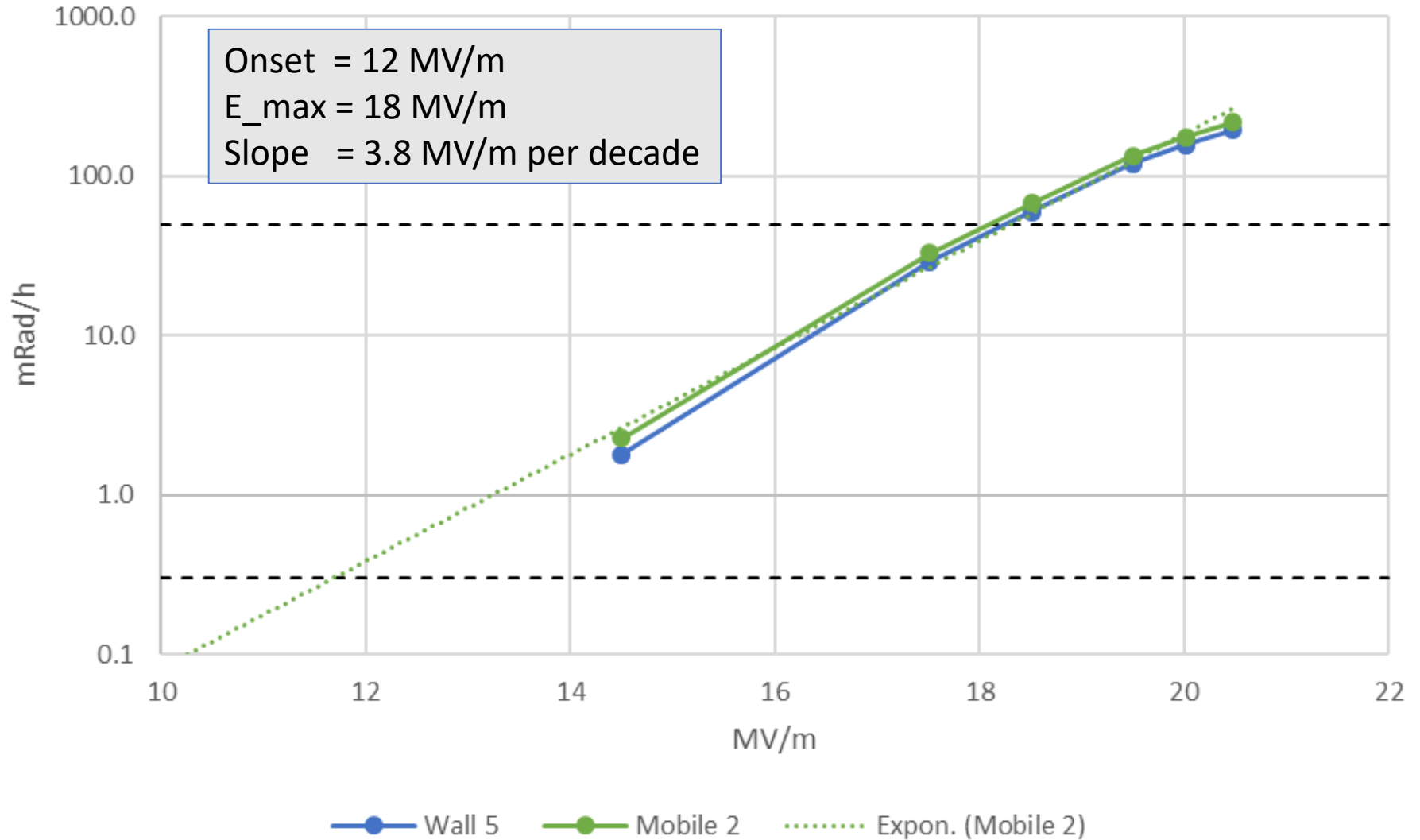
F1.3-02 Cavity 5 (CW)



F1.3-02 Cavity 5 (CW)



F1.3-02 Cavity 5 (CW)



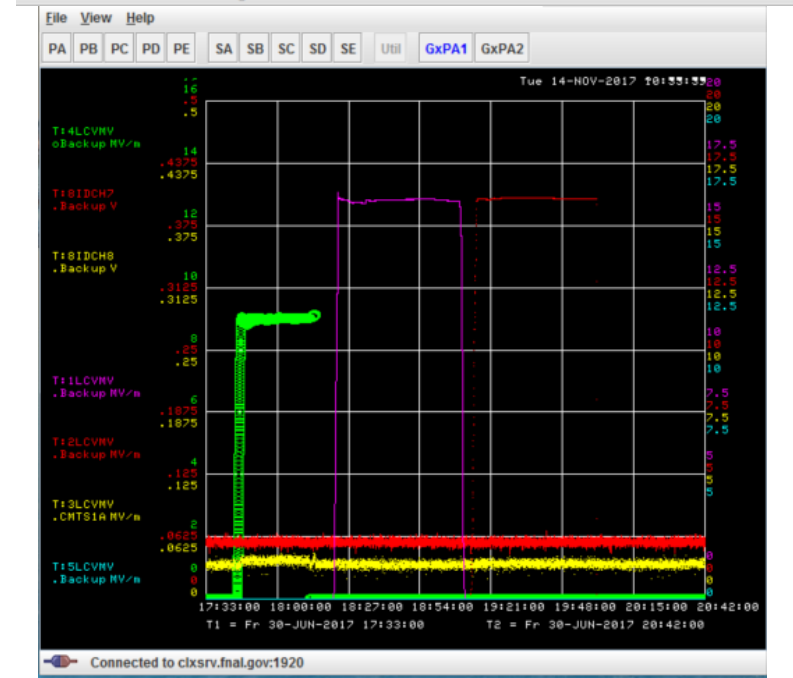
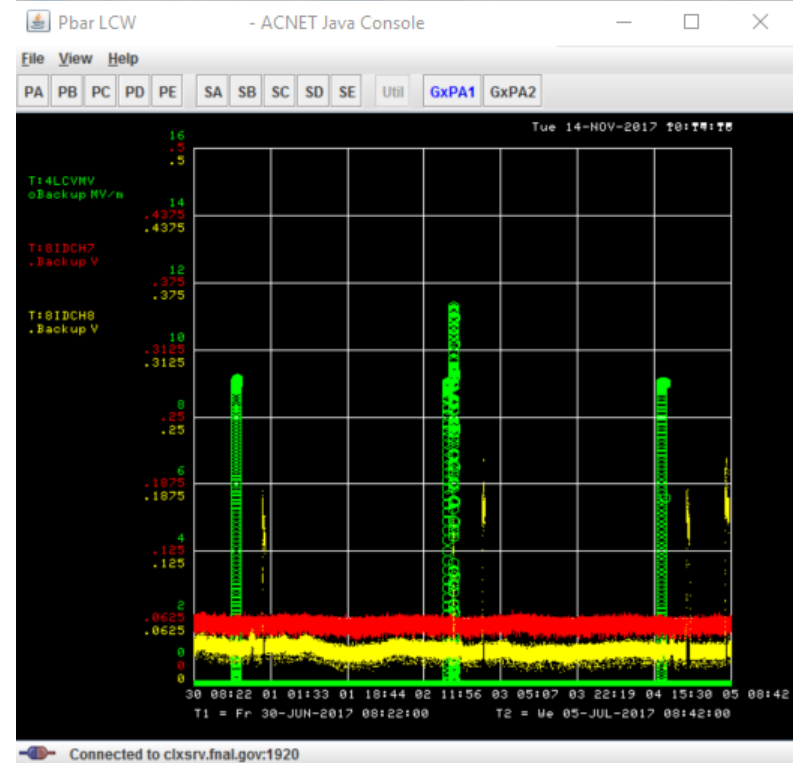
F1.3-03

Cavity		CMTF Gradient		
Cavity ID	Cavity Serial #	Max Gradient [MV/m]	Usable Gradient* [MV/m]	FE onset [MV/m]
F1.3-03-1	CAV0034	21	21.0	No
F1.3-03-2	CAV0039	21	21.0	15.1
F1.3-03-3	CAV0040	12.2	10.0	No
F1.3-03-4	CAV0026	12	9.2	9.2 ?
F1.3-03-5	CAV0027	21	21.0	16.8
F1.3-03-6	CAV0029	21	21.0	No
F1.3-03-7	CAV0042	21	16.8	11
F1.3-03-8	CAV0032	21	21.0	15.4

F1.3-03

Cavity 4

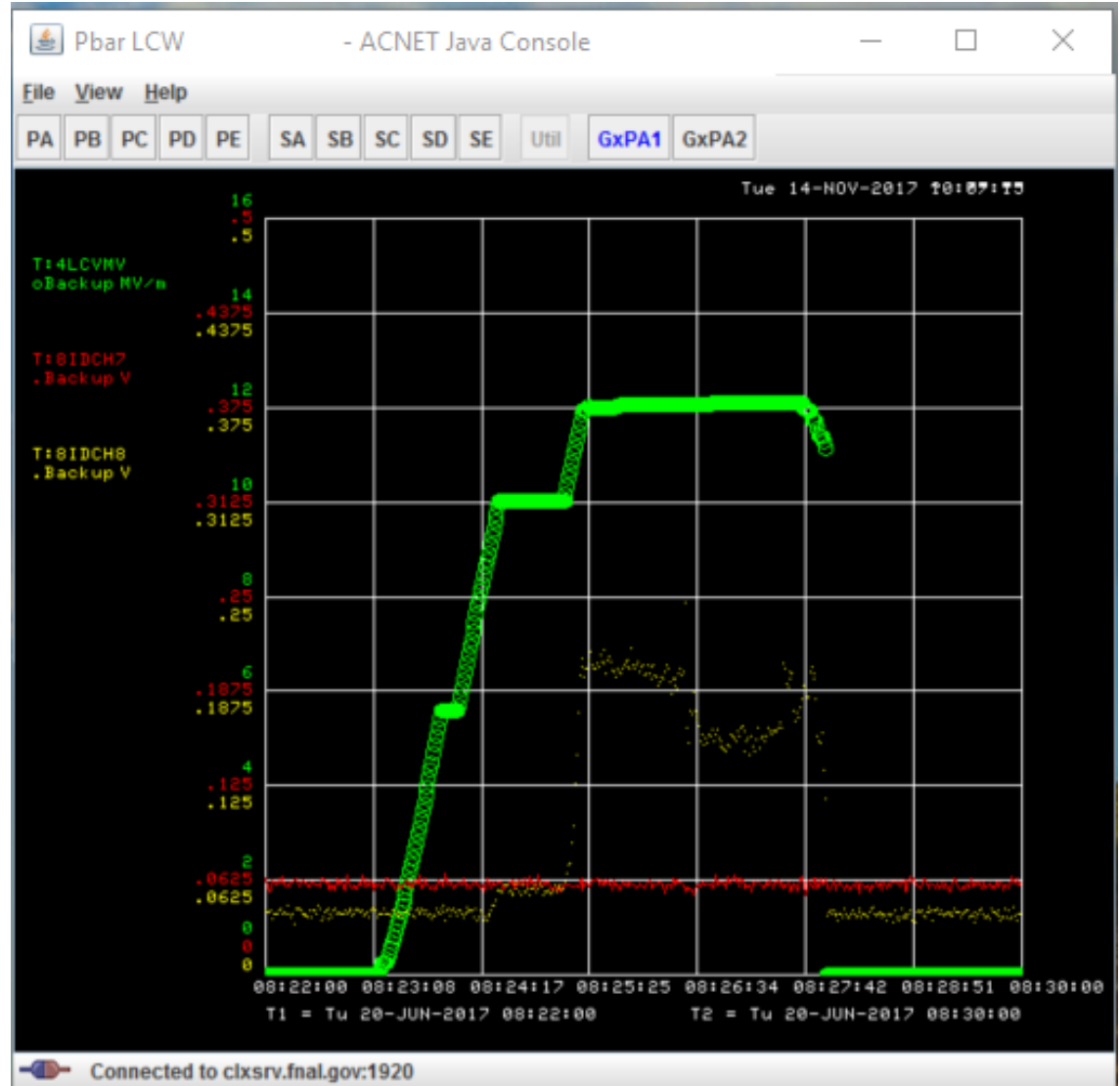
Fr-30-Jun-17



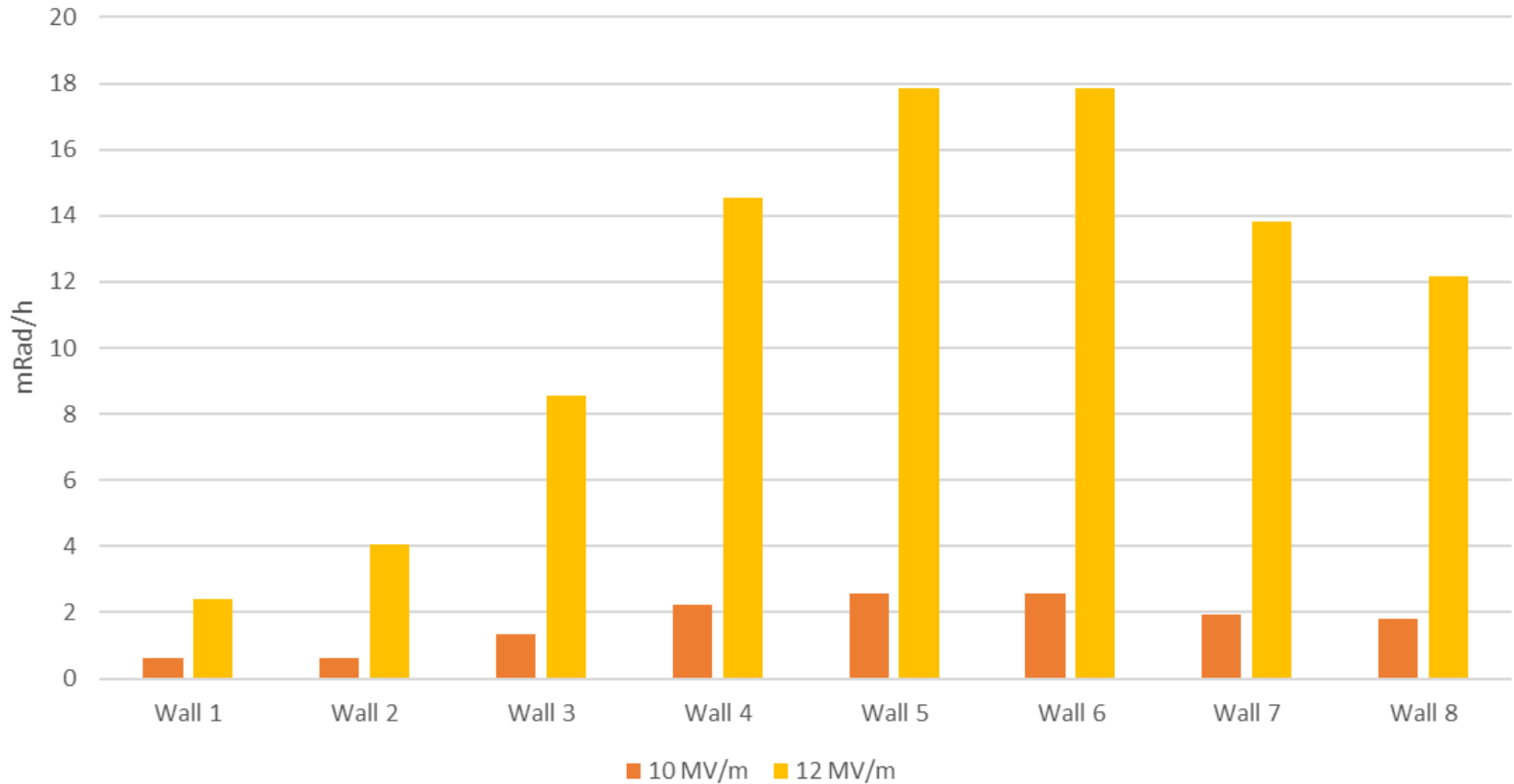
F1.3-03

Cavity 4

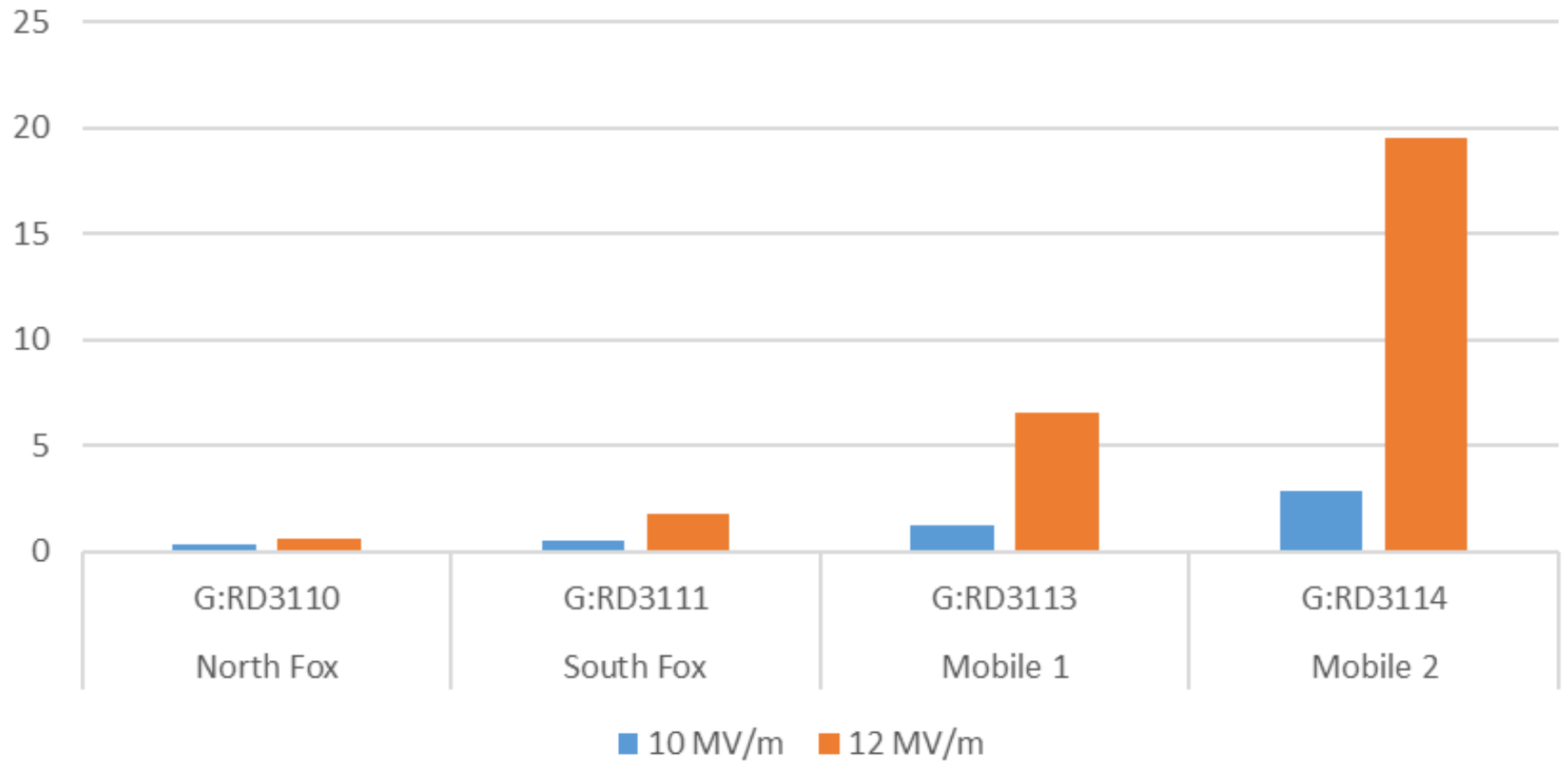
Tu-20-Jun-17



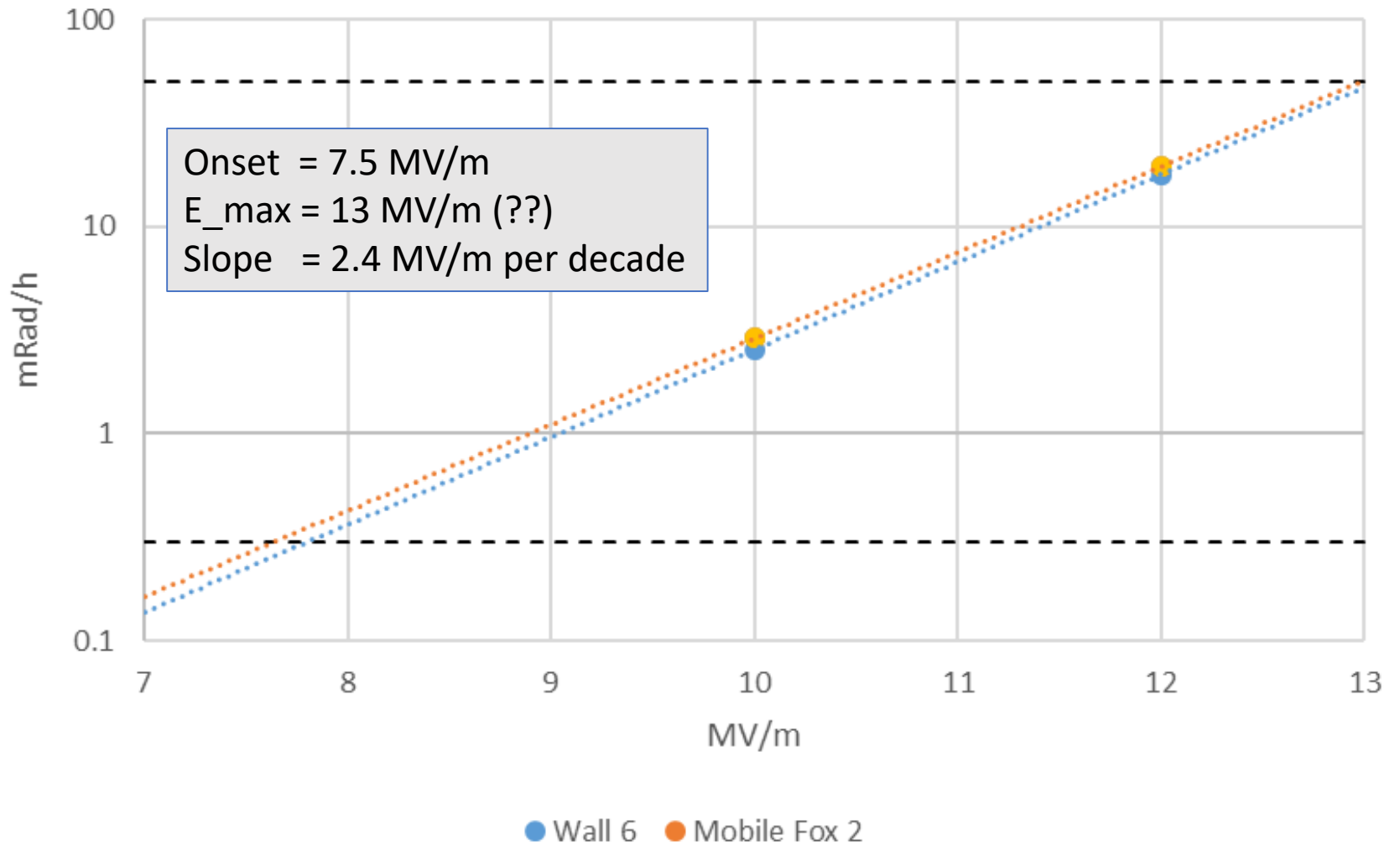
F1.3-03 Cavity 4 (CW)



F1.3-03 Cavity 4 (CW)



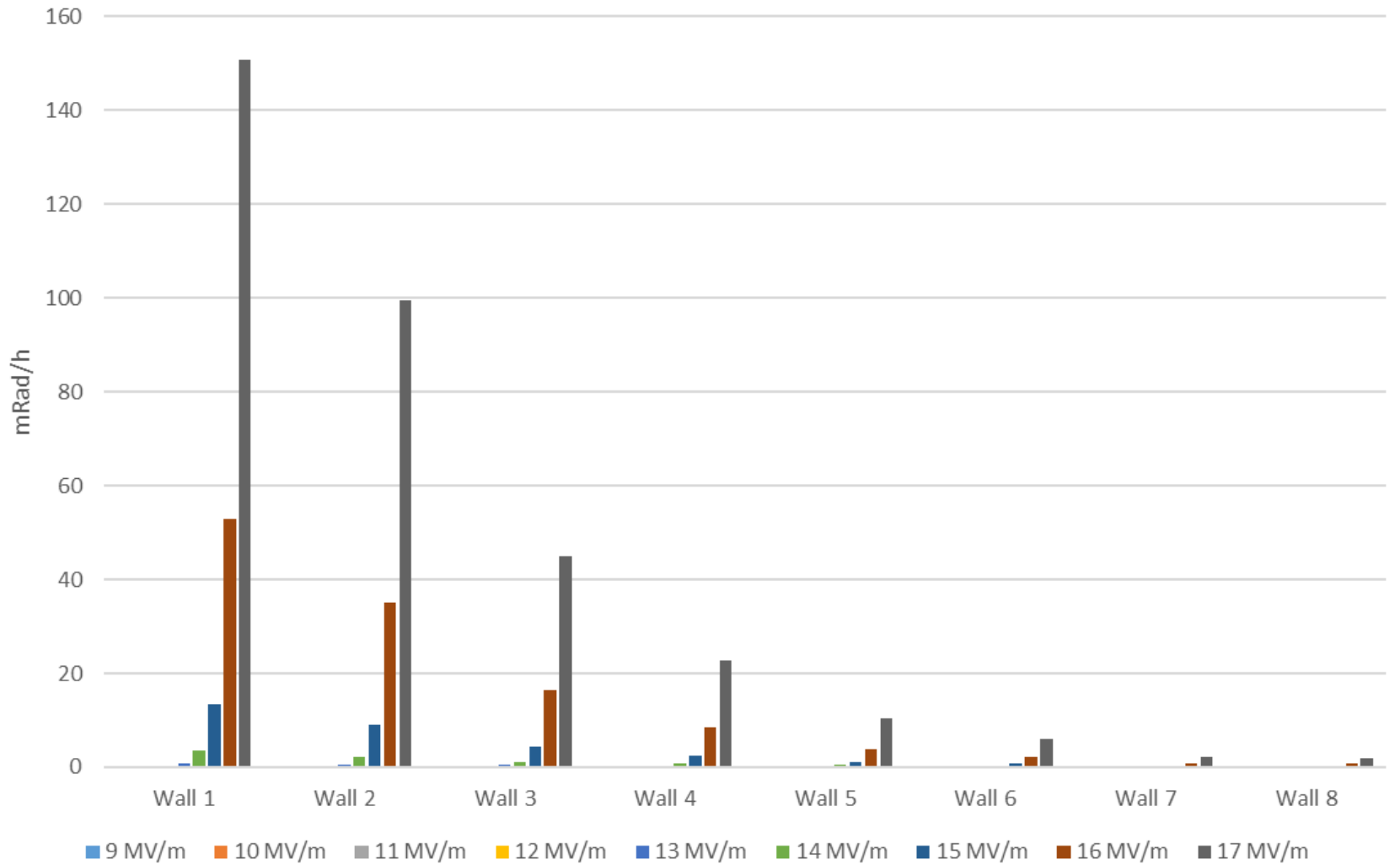
F1.3-03 Cavity 4 (CW)



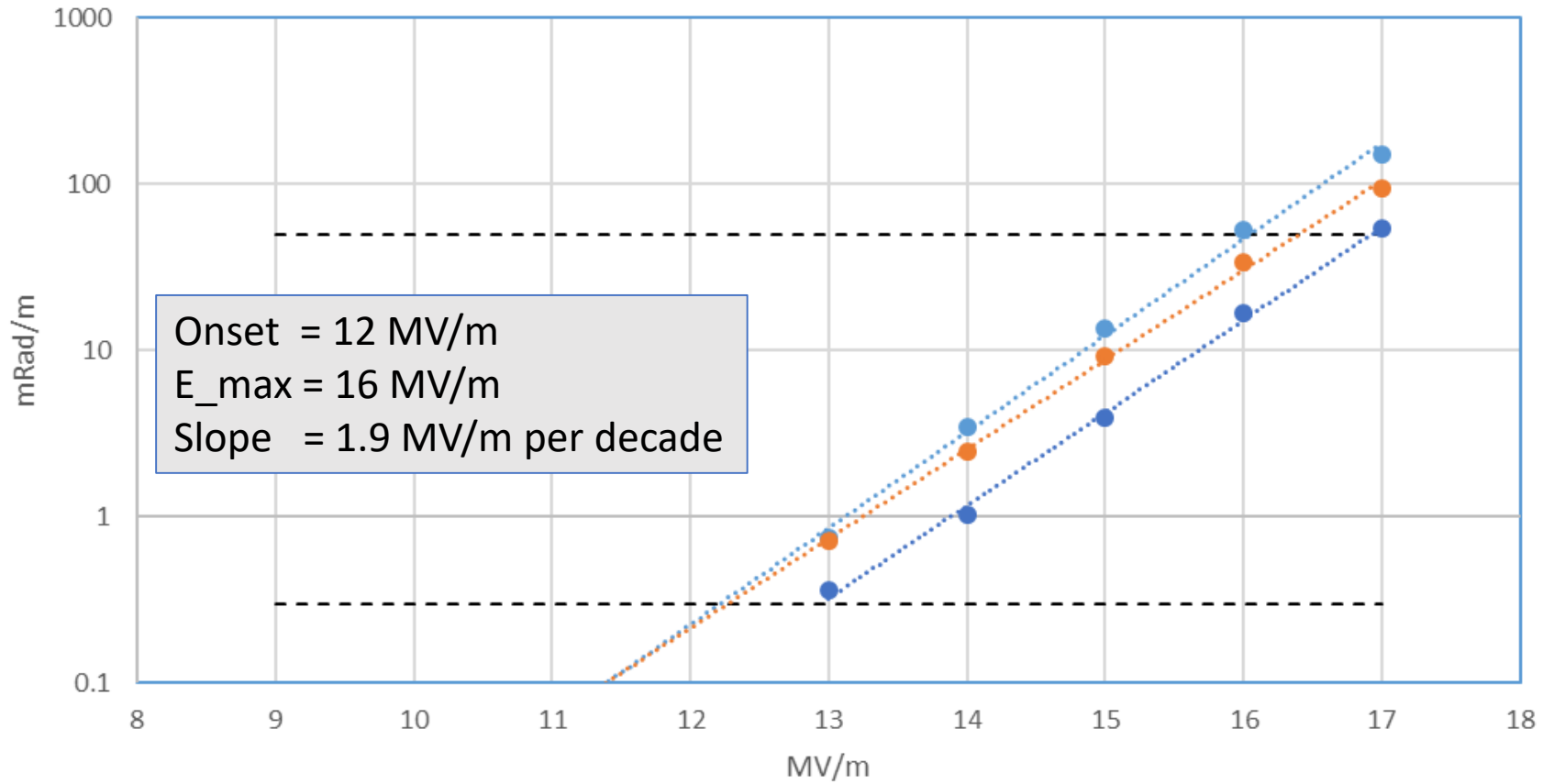
F1.3-04

Cavity		CMTF Gradient		
Cavity ID	Cavity Serial #	Max Gradient [MV/m]	Usable Gradient* [MV/m]	FE onset [MV/m]
F1.3-04-1	CAV0052	21	21.0	no
F1.3-04-2	CAV0036	21	21.0	15.2
F1.3-04-3	CAV0019	21	16.0	12
F1.3-04-4	CAV0041	21	21.0	no
F1.3-04-5	CAV0030	21	21.0	16.5
F1.3-04-6	CAV0020	19.8	19.3	16.5 ? 13.9 12 ?
F1.3-04-7	CAV0051	20	19.6	No
F1.3-04-8	CAV0221	19.7	19.5	No

F1.3-04 Cavity 3 (CW)



F1.3-04 Cavity 3 (CW)

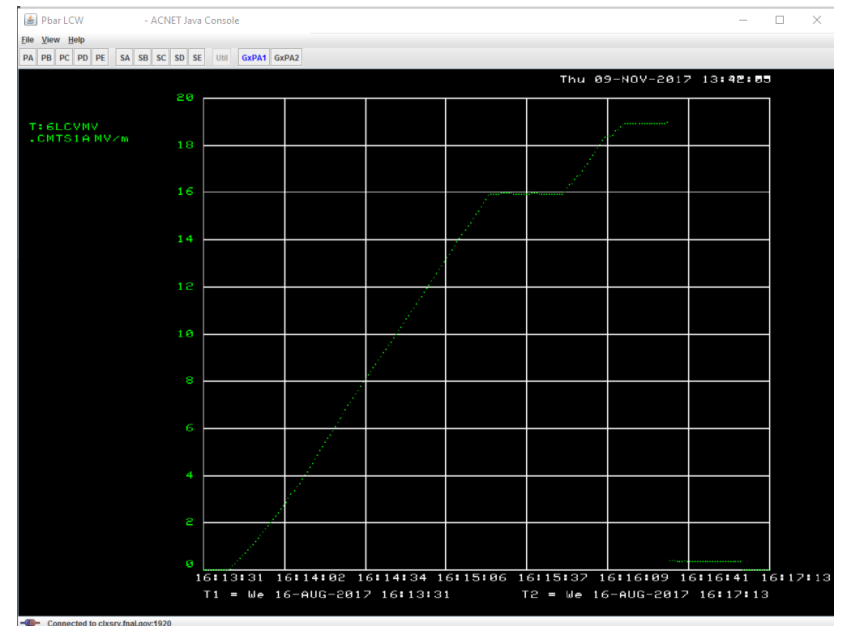
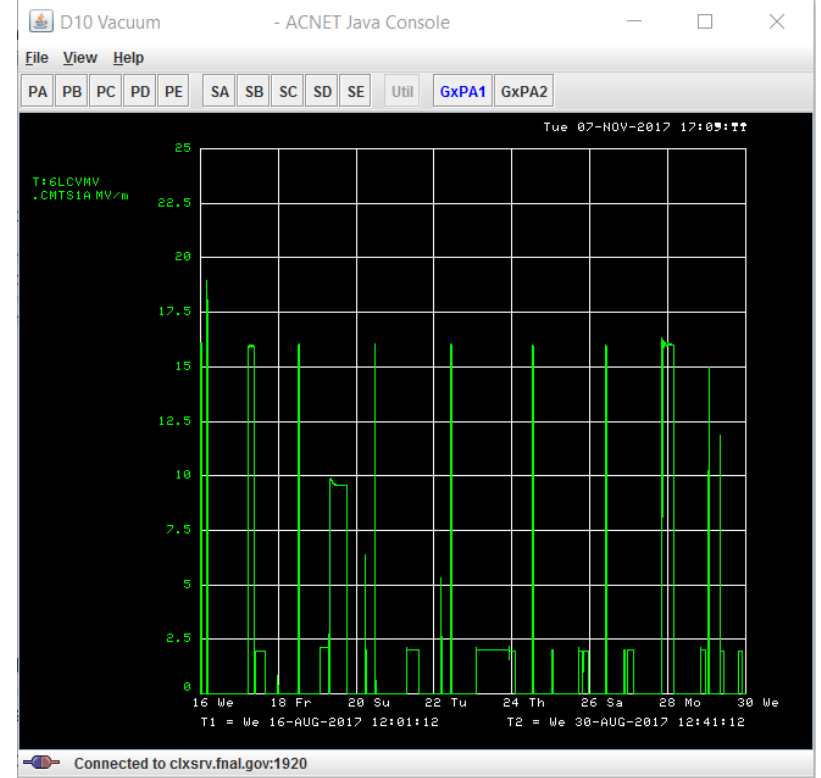


● Wall 1 ● Mobile 1 ● North Fox

F1.3-04

Cavity 6

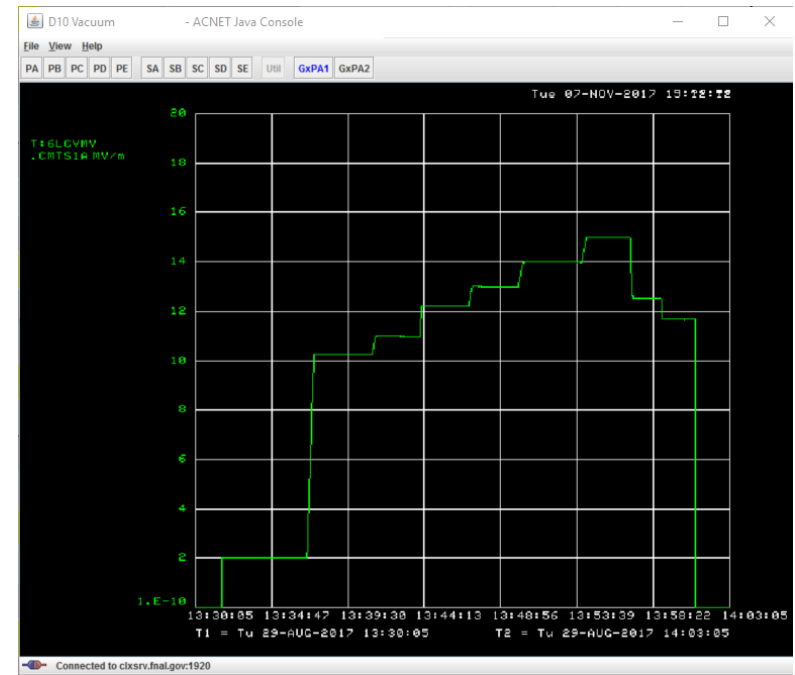
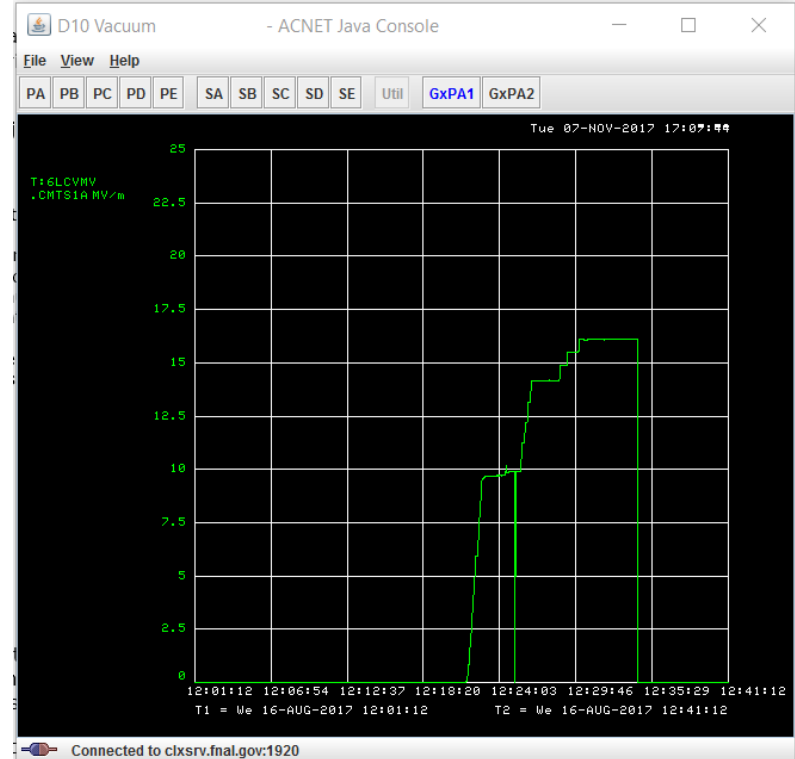
Tu-29-Aug-17



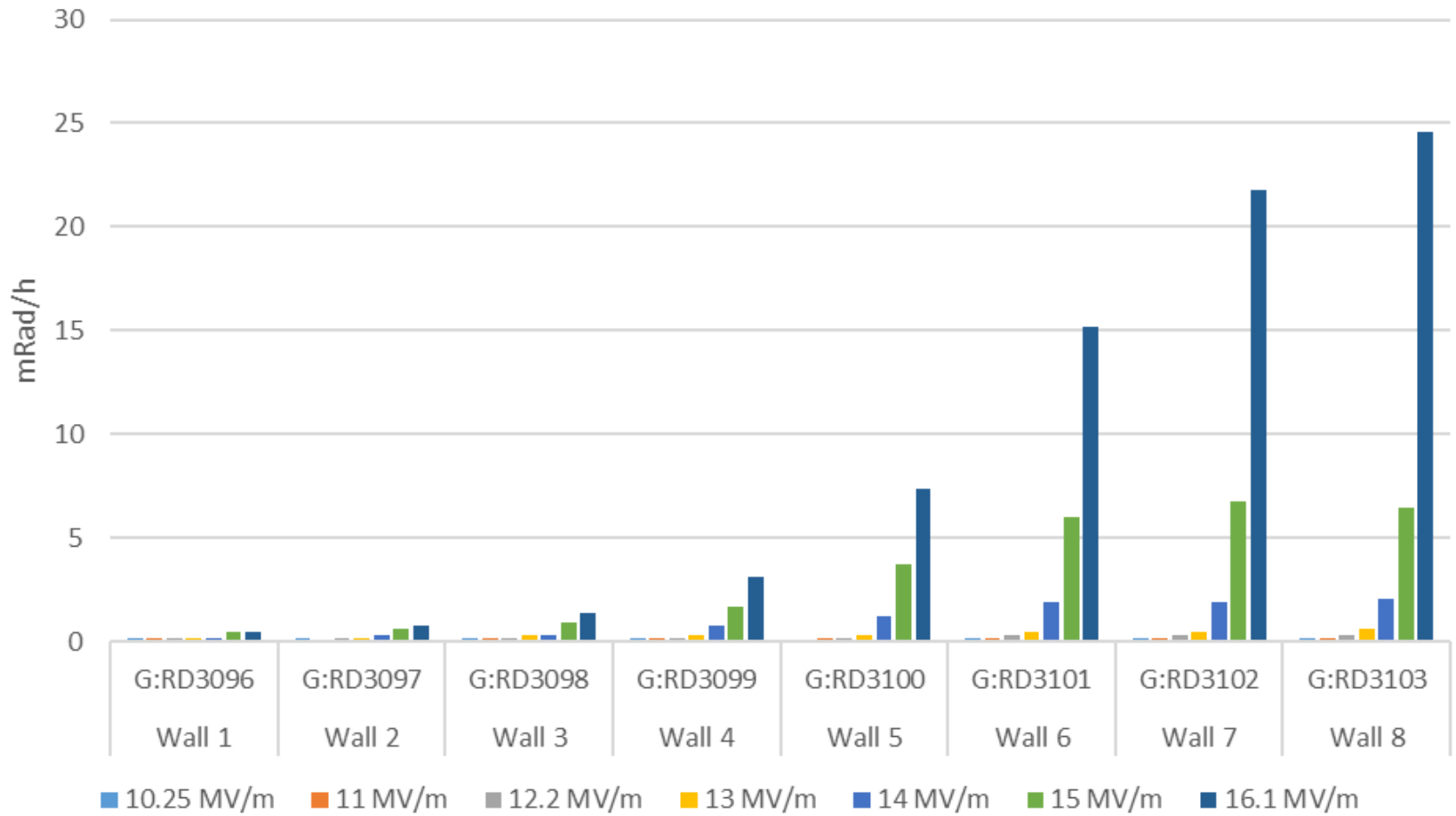
F1.3-04

Cavity 6

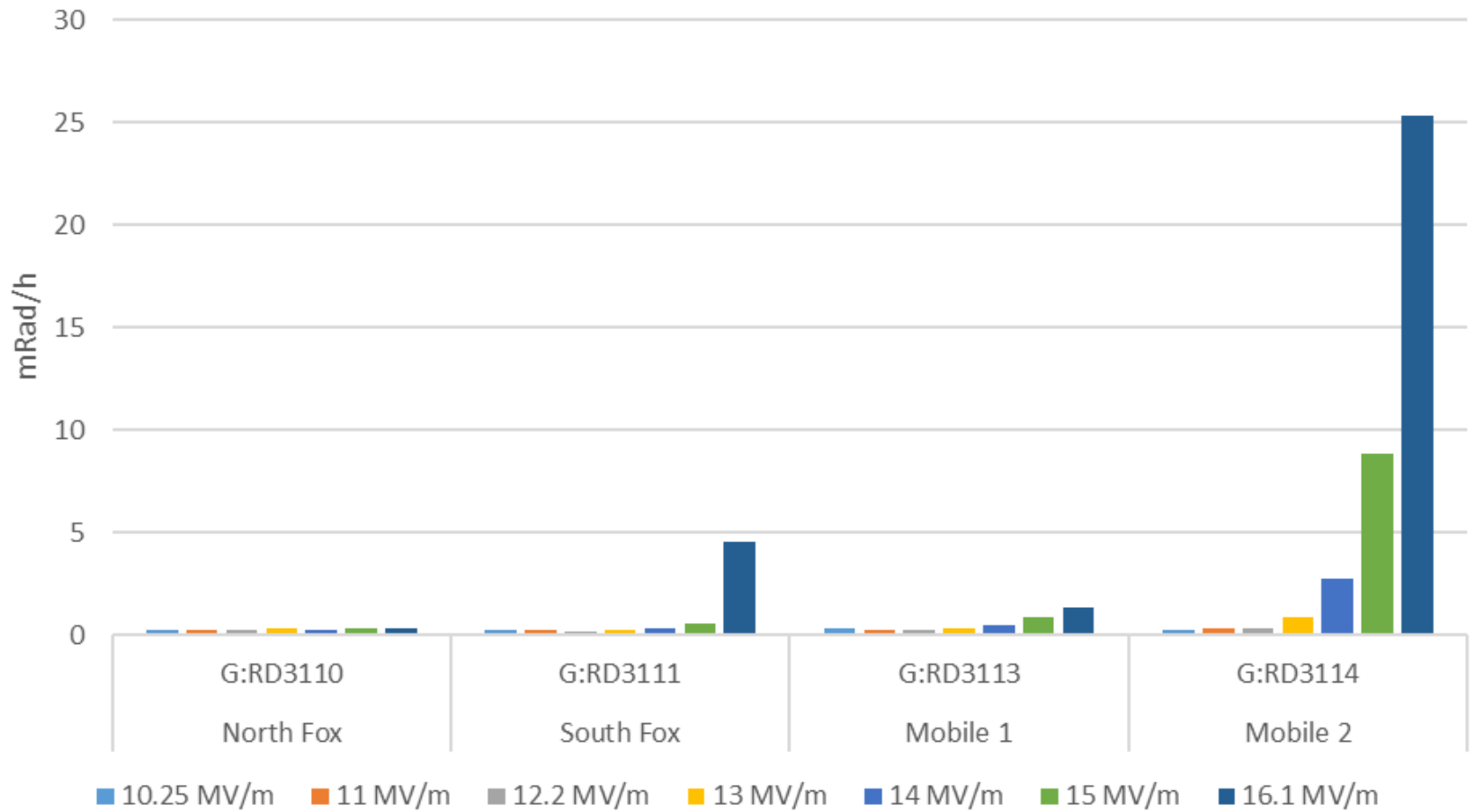
Tu-29-Aug-17



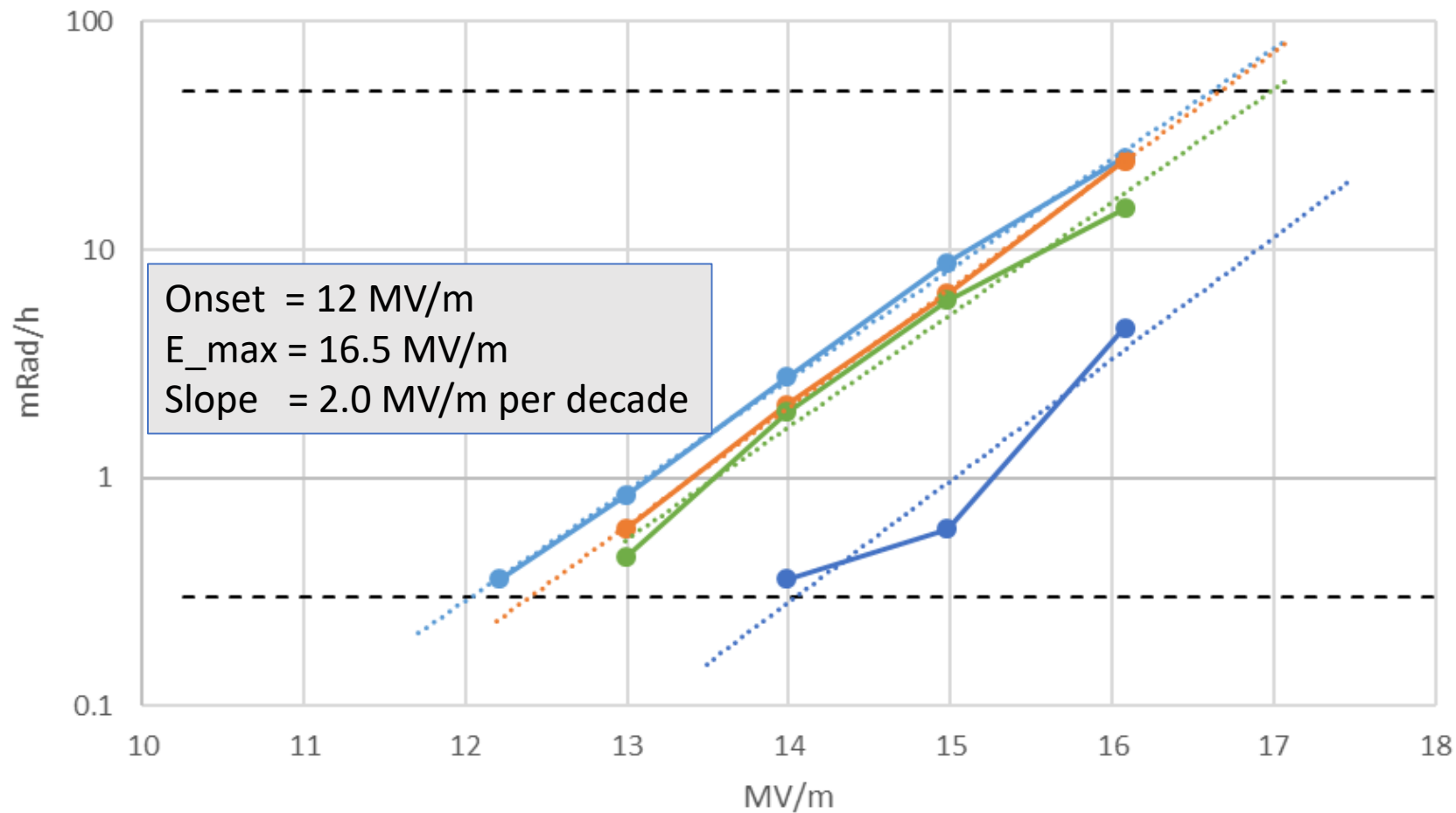
F1.3-04 Cavity 6 (CW)



F1.3-04 Cavity 6 (CW)



F1.3-04 Cavity 6 (CW)

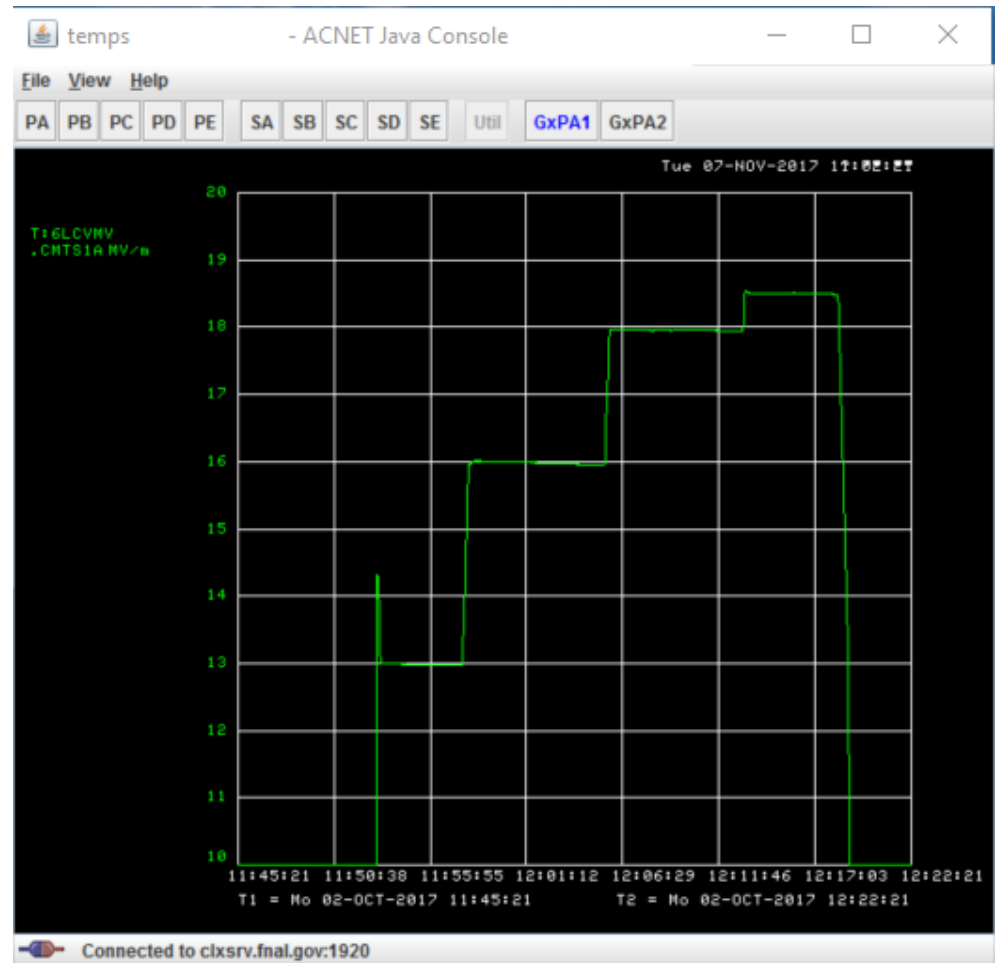


● Mobile 2 ● Wall 8 ● South Fox ● Wall 6

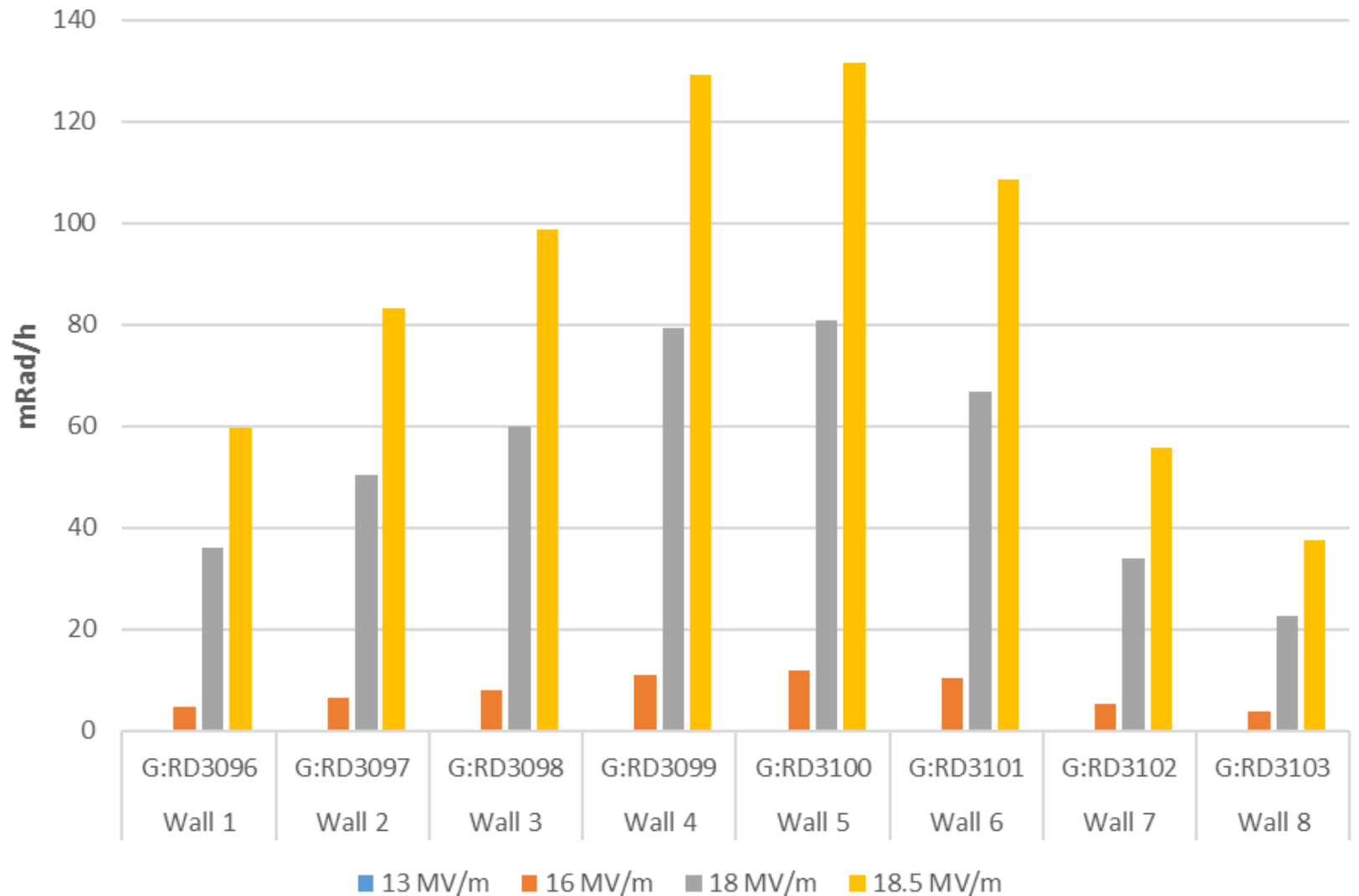
J1.3-01

Cavity 6

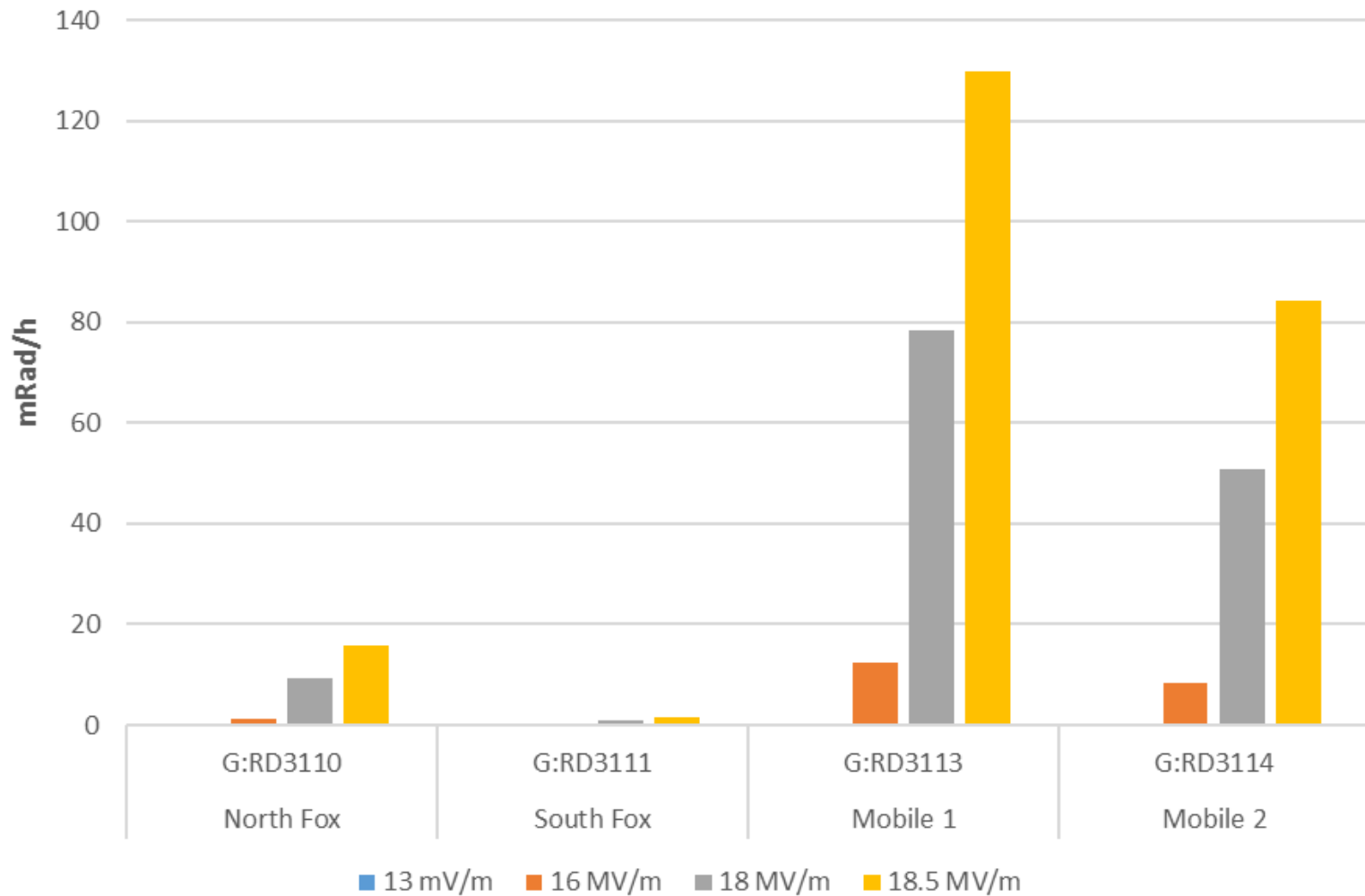
Tu-02-Oct-17



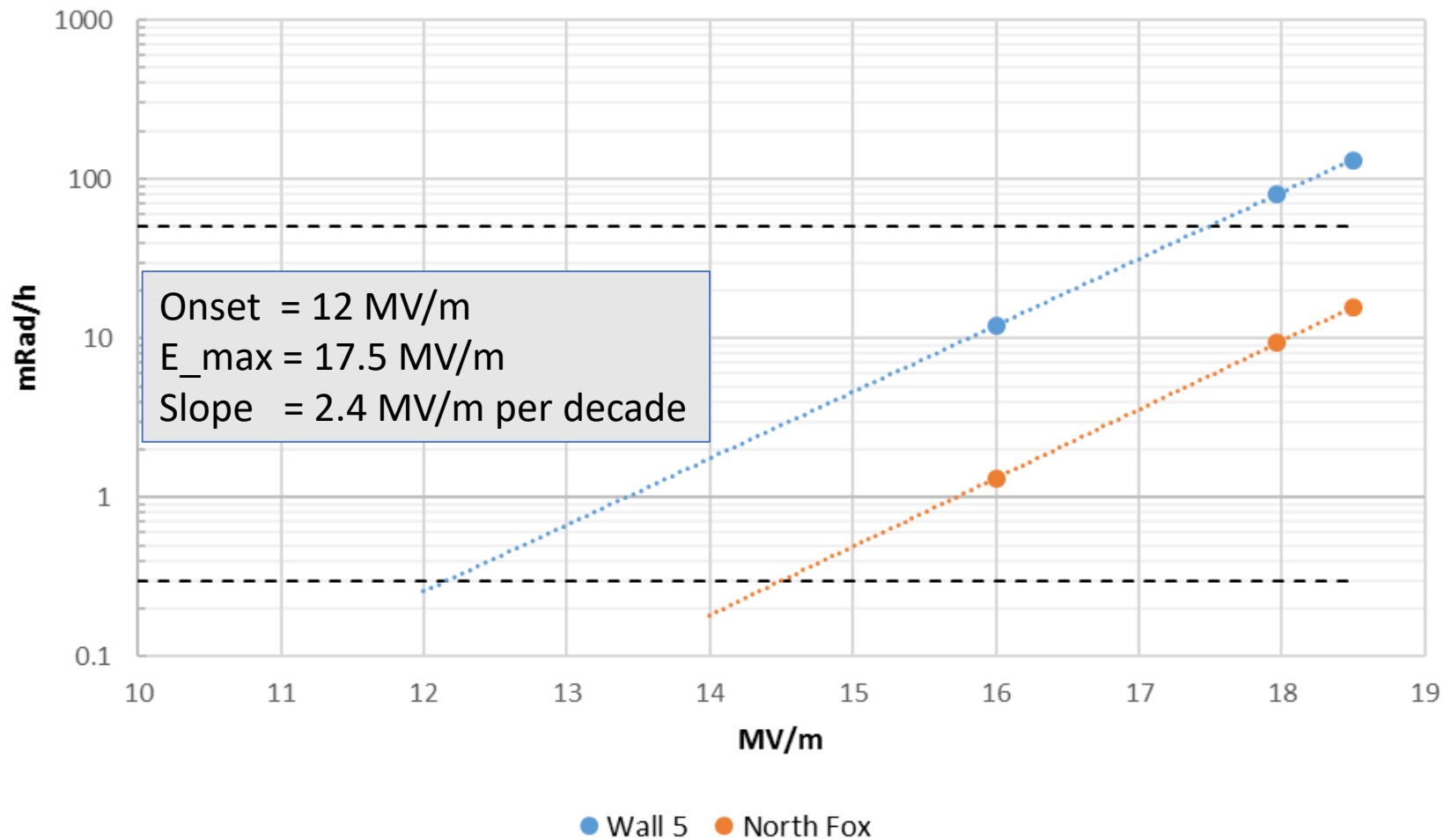
J1.3-01 Cavity 6 (CW)



J1.3-01 Cavity 6 (CW)



J1.3-06 Cavity 6 (CW)



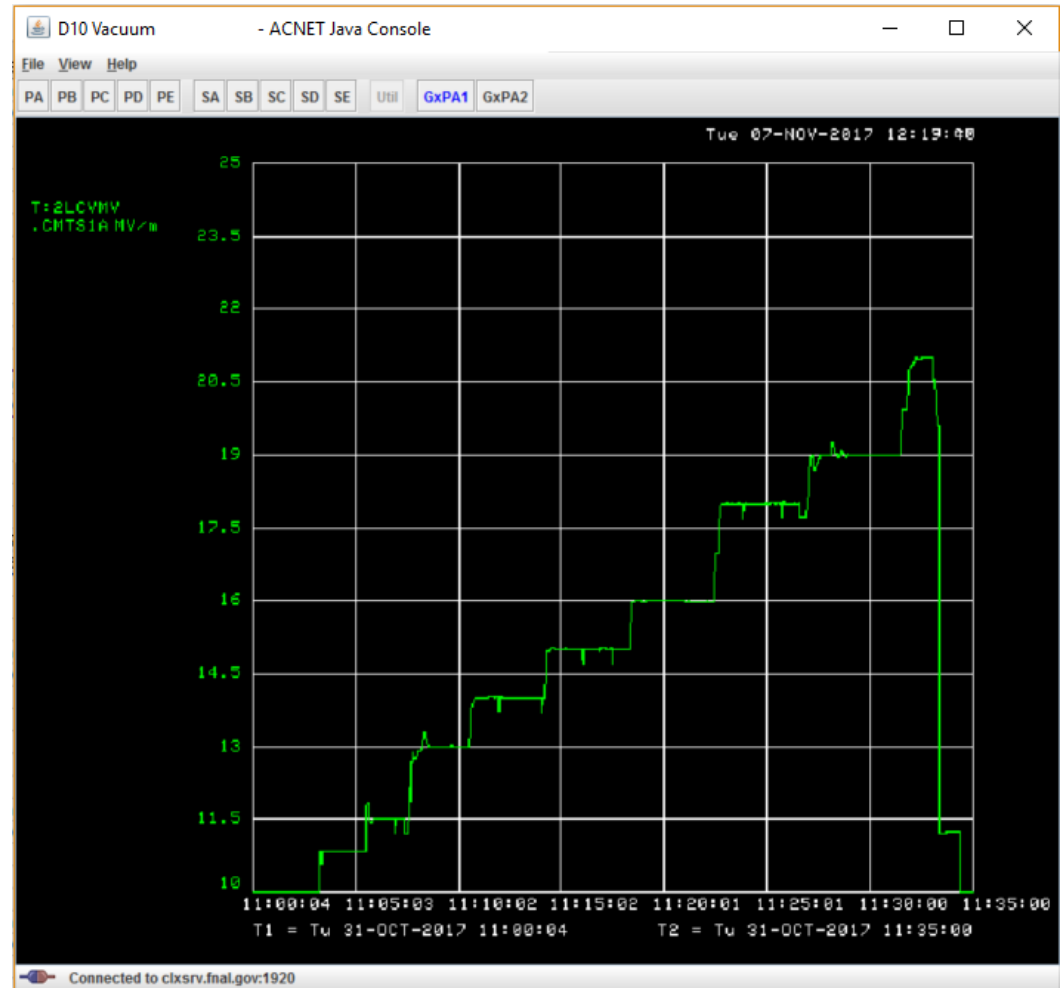
F1.3-06

Cavity		CMTF Test		
Cavity ID	Cavity Serial #	Max** Gradient [MV/m]	Usable Gradient*** [MV/m]	FE onset [MV/m]
F1.3-06-1	CAV0064	21	2.10E+01	No
F1.3-06-2	CAV0081	21	18.4	13.2
F1.3-06-3	CAV0077	19.85	19.6	No
F1.3-06-4	CAV0074	21	2.10E+01	No
F1.3-06-5	CAV0078	20.2	1.98E+01	No
F1.3-06-6	CAV0086	21	2.08E+01	No
F1.3-06-7	CAV0085	21	1.90E+01	No
F1.3-06-8	CAV0068	21	1.75E+01	No

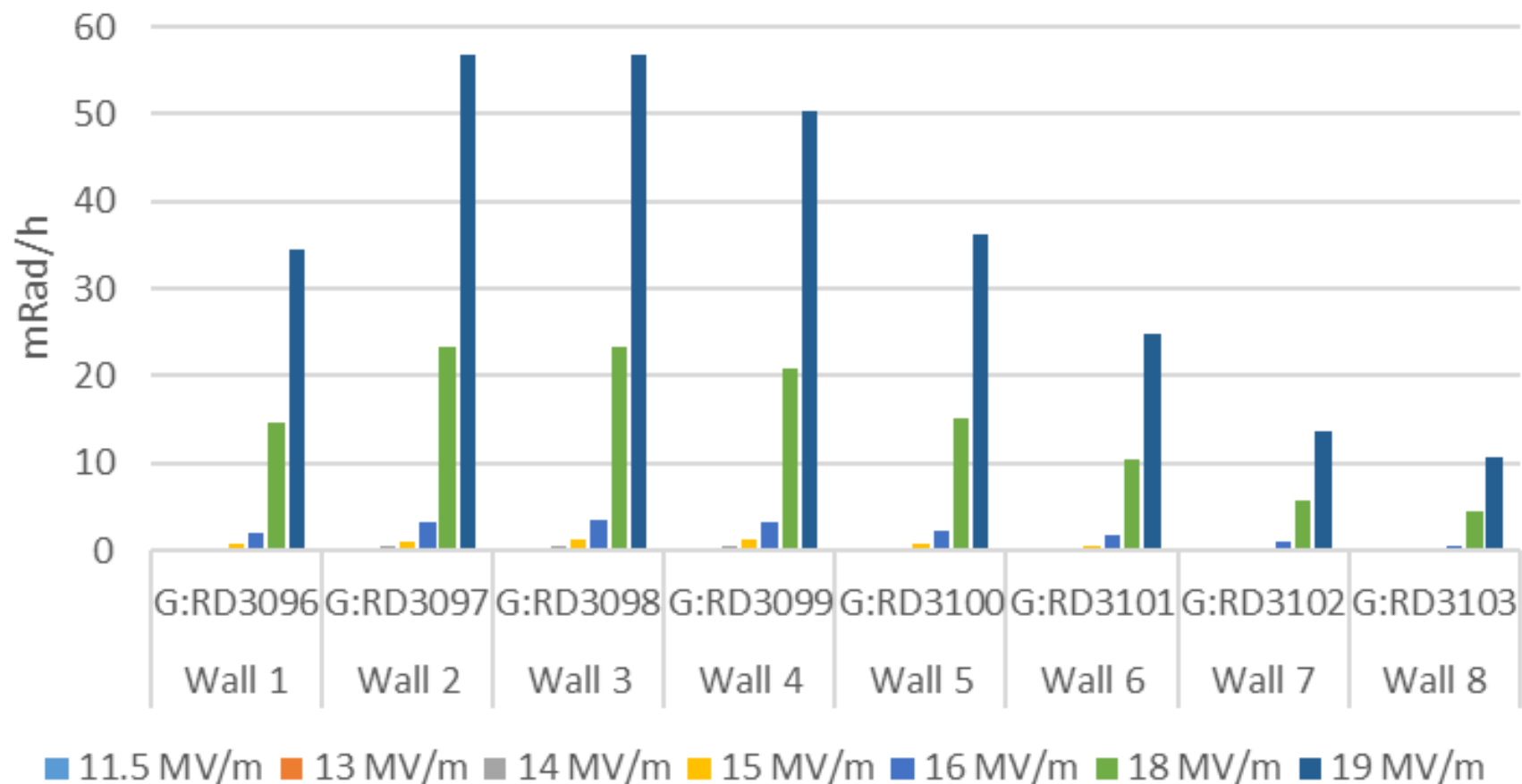
F1.3-06

Cavity 2

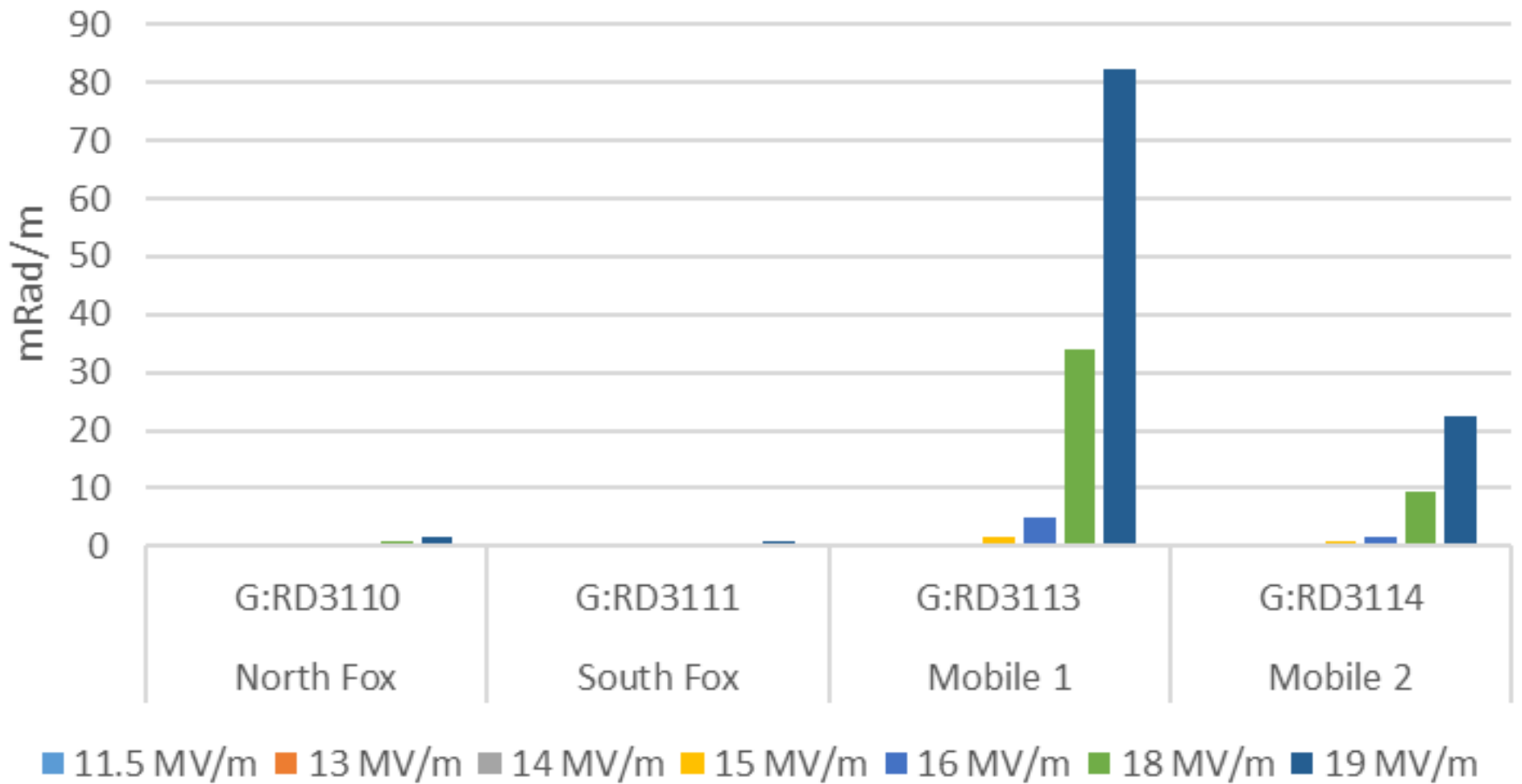
Tu-31-Oct-17



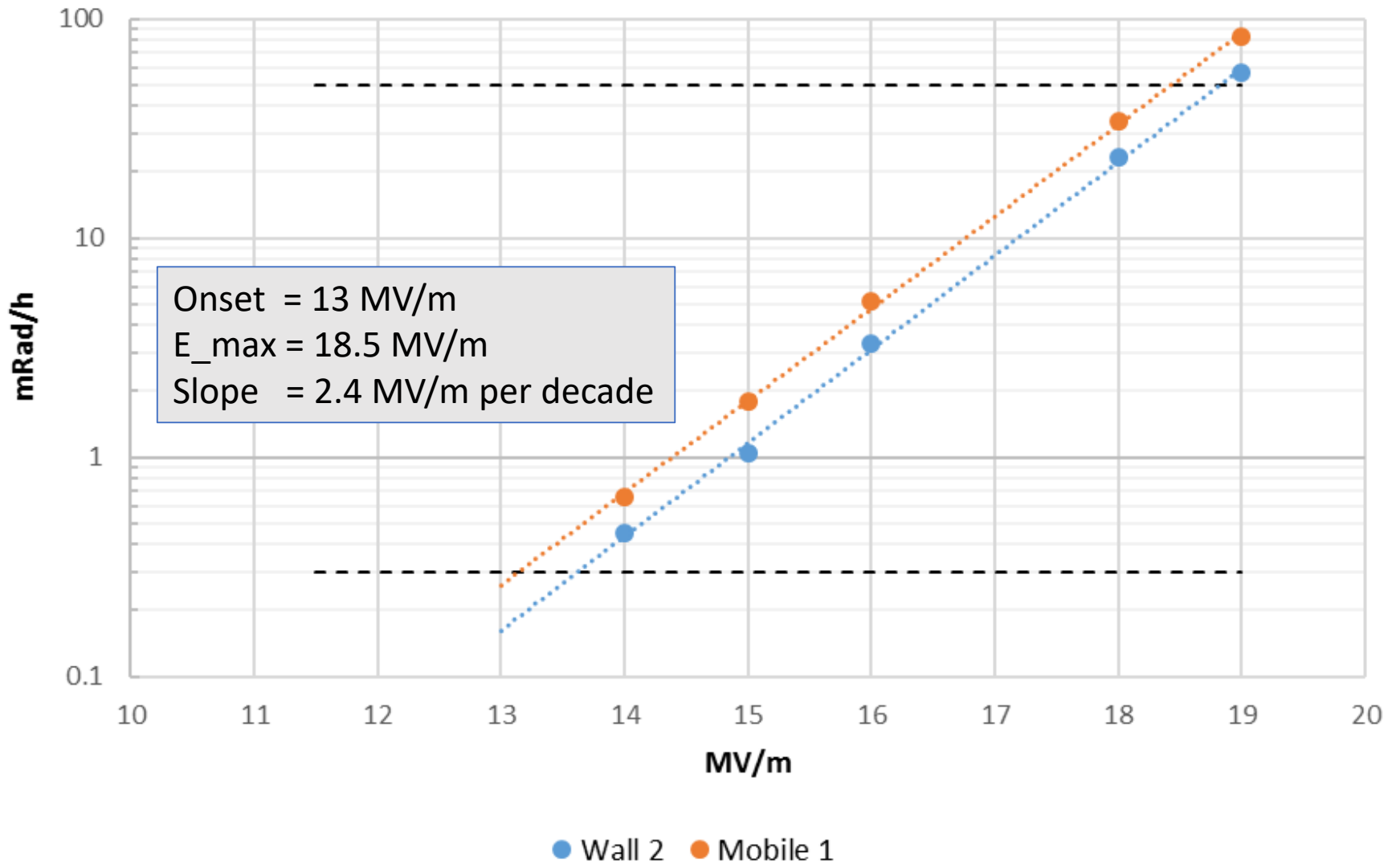
F1.3-06 Cavity 2 (CW)



F1.3-06 Cavity 2 (CW)



F1.3-06 Cavity 2



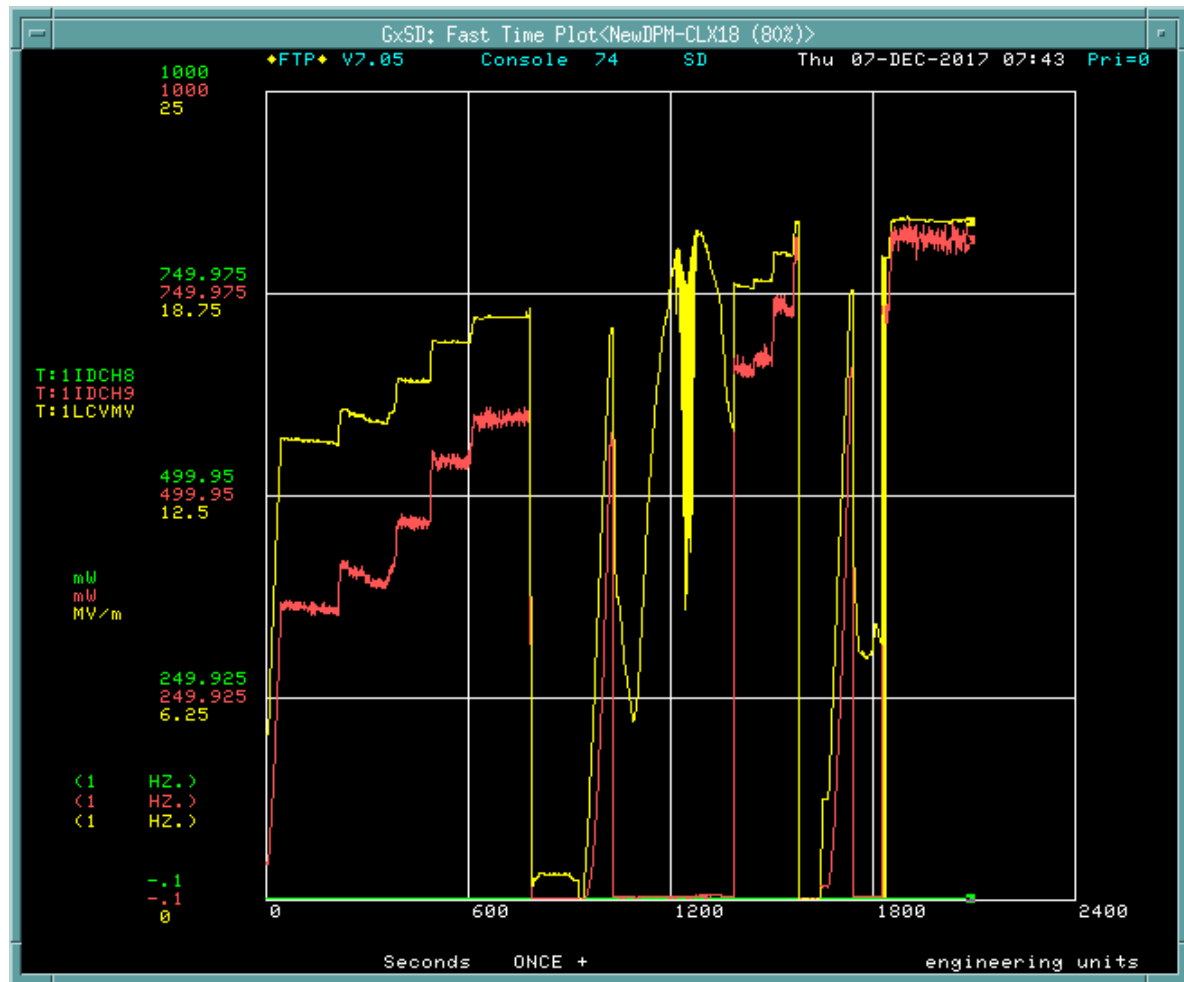
F1.3-05

	Cavity	VTS		CMTF Test	Usable Gradient*** [MV/m]	FE onset [MV/m]	Q0 @16MV/m 2K @ 80 g/s	Q0 @16MV/m 2K @ 1.5 g/s	Material
		Eacc* [MV/m]	Q0@ 16MV/m	Max** Gradient [MV/m]					
1	CAV0045	22	3.3 E+10	21	21	17	3.49 E+10	2.70 E+10	TD 900C
2	CAV0038	28.2	3.3 E+10	20	15	13.8	3.16 E+10	2.54 E+10	TD 900C
3	CAV0047	19.5	3.65 E+10	19.6	19.6	18	3.57 E+10	2.69 E+10	TD 900C
4	CAV0050	23	3.2 E+10	19.5	19	none	3.95 E+10	2.05 E+10	TD 900C
5	CAV0071	20	2.5 E+10	21	21	none	2.28 E+10	2.24 E+10	NXB 900C
6	CAV0223	19.2	2.8 E+10	18.5	18.5	none	2.42 E+10	2.32 E+10	TD 900C
7	CAV0069	19	2.9 E+10	18.4	18.4	none	2.53 E+10	2.56 E+10	NXA 900C
8	CAV0037	20	3.25 E+10	19.9	19.9	none	3.57 E+10	2.80 E+10	TD 900C
	<i>Average</i>	21.36	3.11 E+10	20.8	19.05		3.12 E+10	2.49 E+10	
	Total Voltage			152.1 MV					
	*Note: No VTS administrative limit								
	**21 MV/m is CMTF administrative limit								
	***50mR/h wall radiation detector								

F1.3-05

Cavity 1

Th-07-Dec-17



F1.3-05, Cav1

Cavity 1 testing underwent five phases:

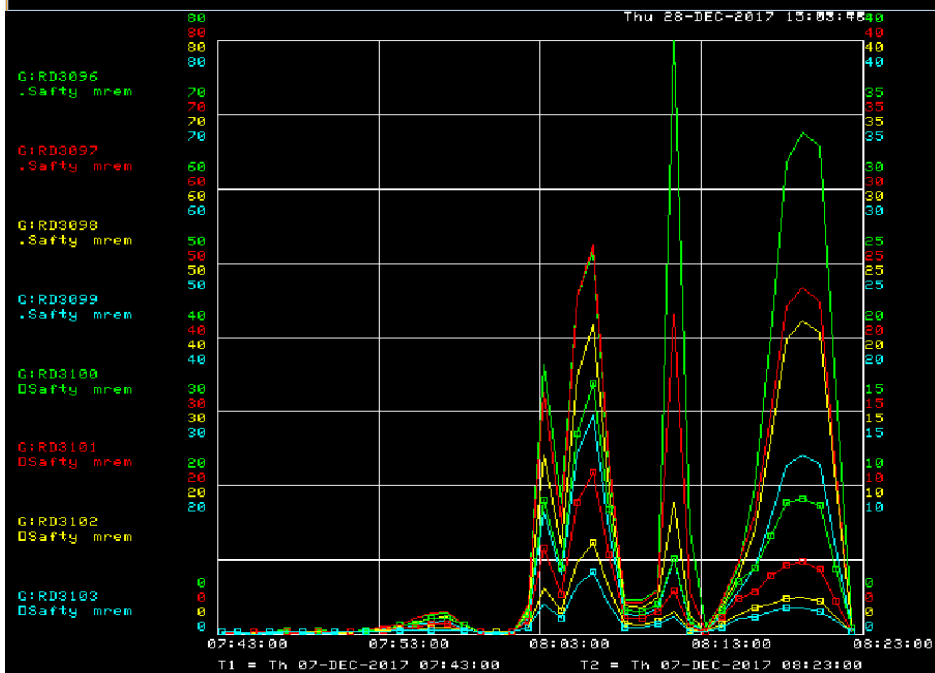
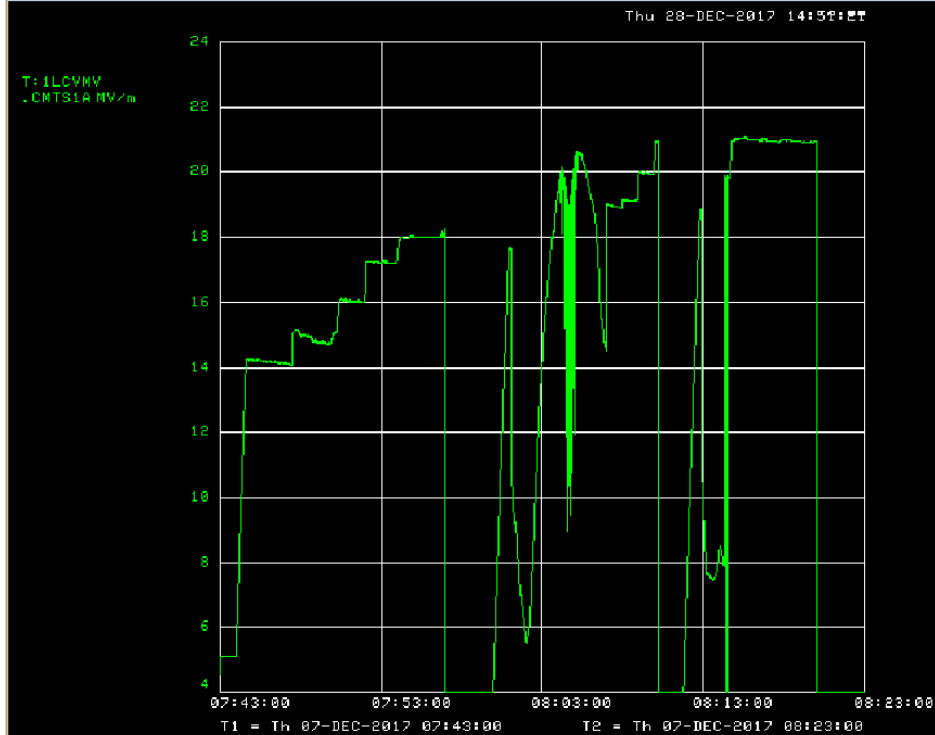
ph1) 7:43 – 7:57: gradient ramp
with very small FE

ph2) 7:57 – 8:07: RF conditioning
with FE (MP?)

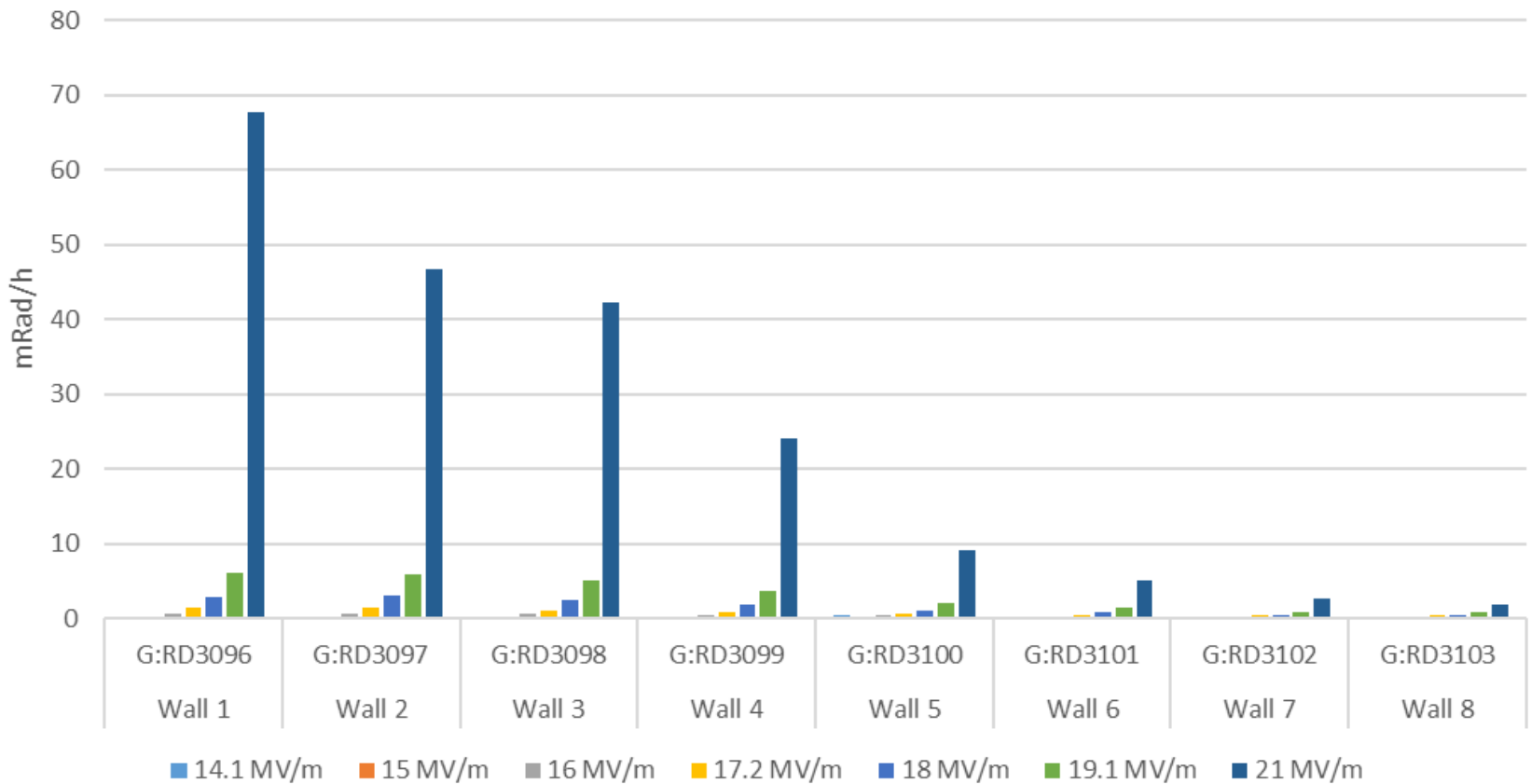
ph3) 8:07 – 8:10: gradient ramp
with very small FE

ph4) 8:10 – 8:14: RF conditioning
with high FE (MP?)

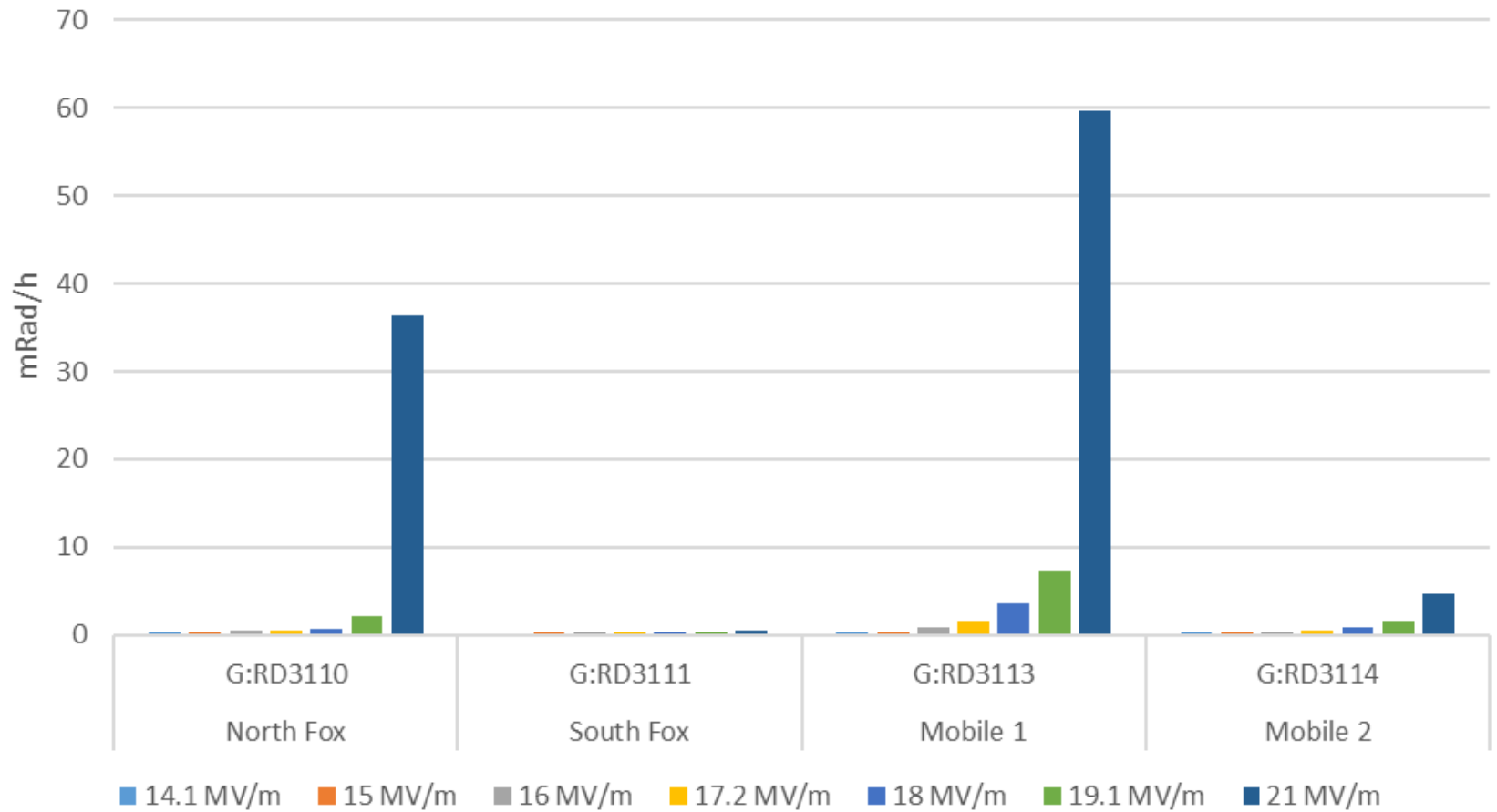
ph5) 8:14 – 8:20: at 21 MV/m
with high FE



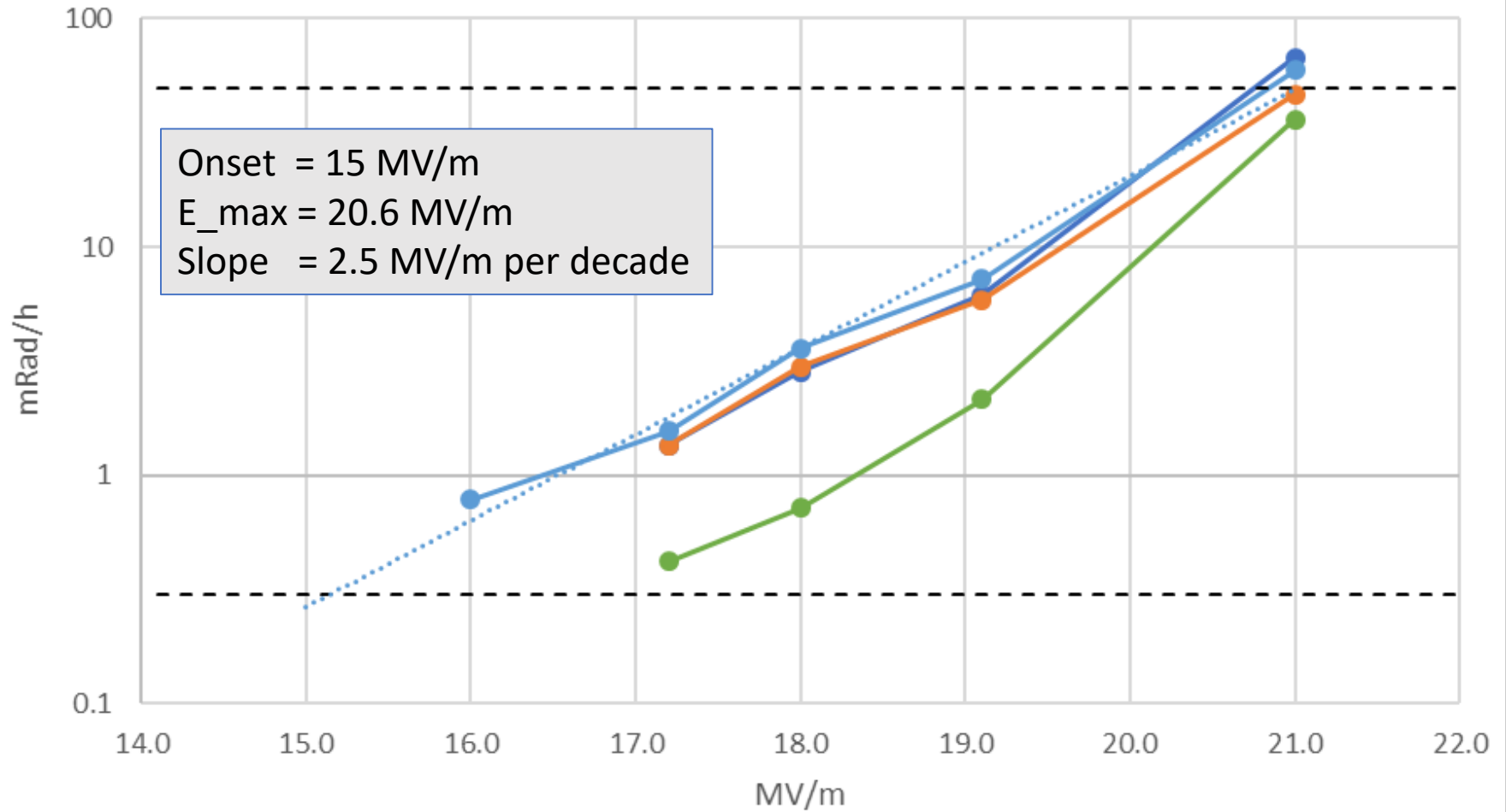
F1.3-05 Cavity 1 (CW)



F1.3-05 Cavity 1 (CW)



F1.3-05 Cavity 1 (CW)

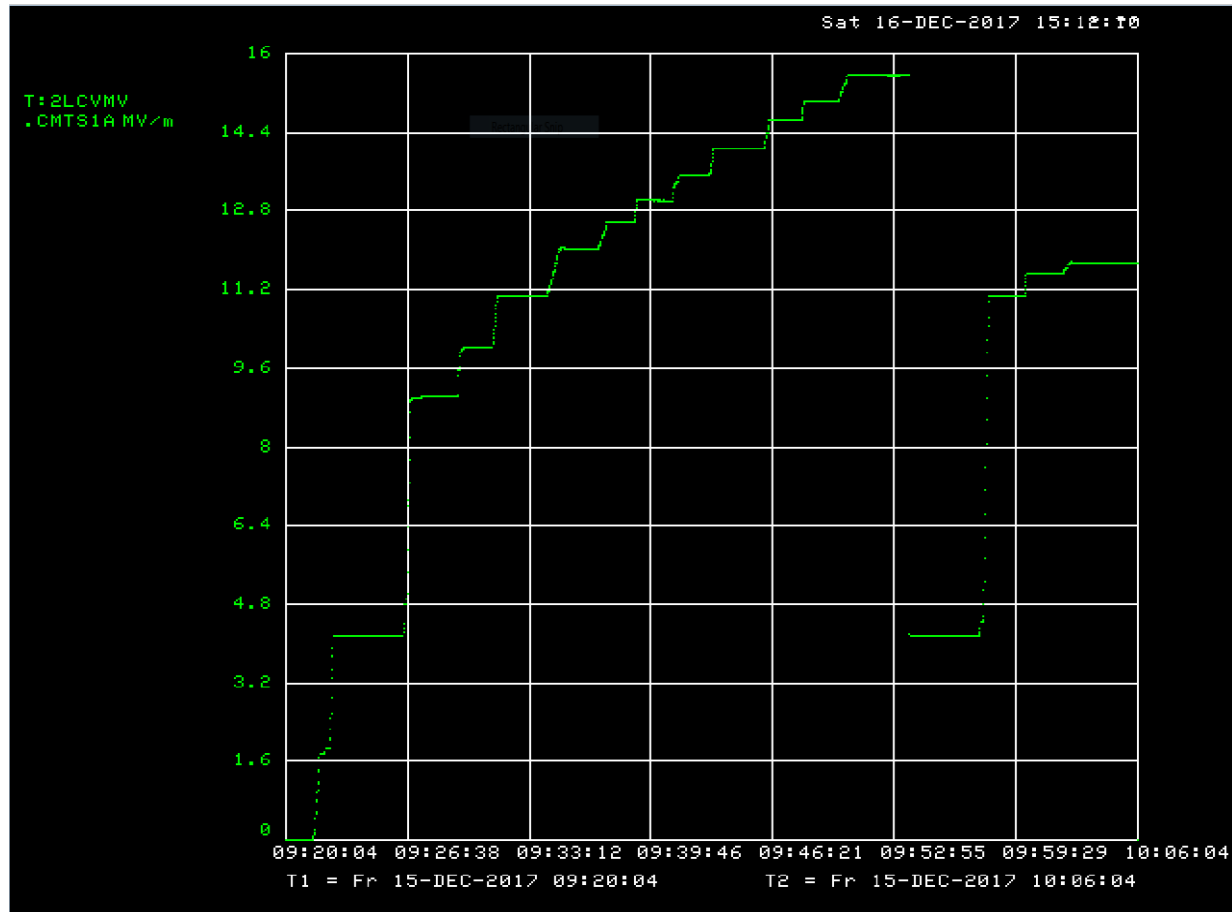


—●— North Fox —●— Wall 1 —●— Wall 2 —●— Mobile 1 Expon. (Mobile 1)

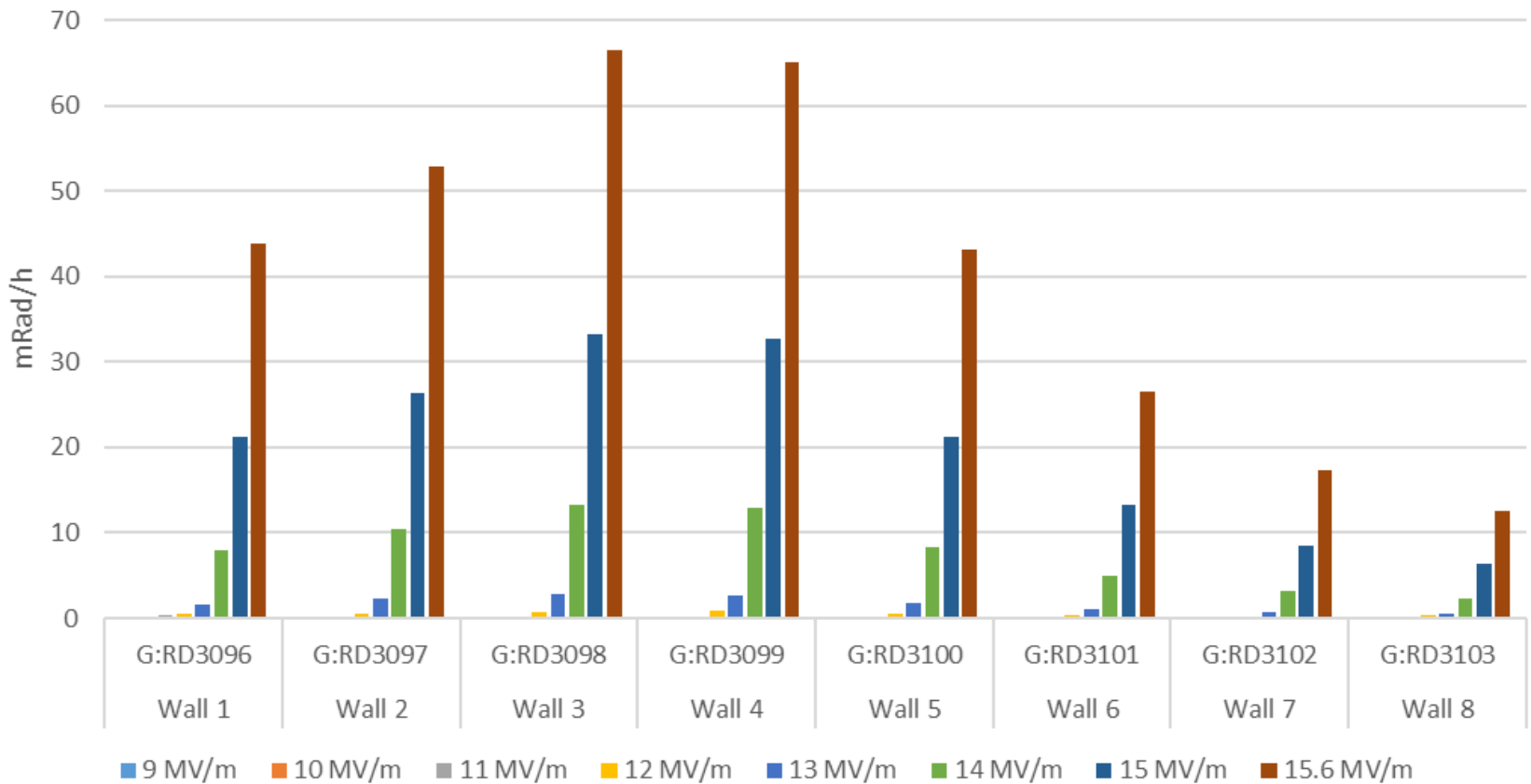
F1.3-05

Cavity 2

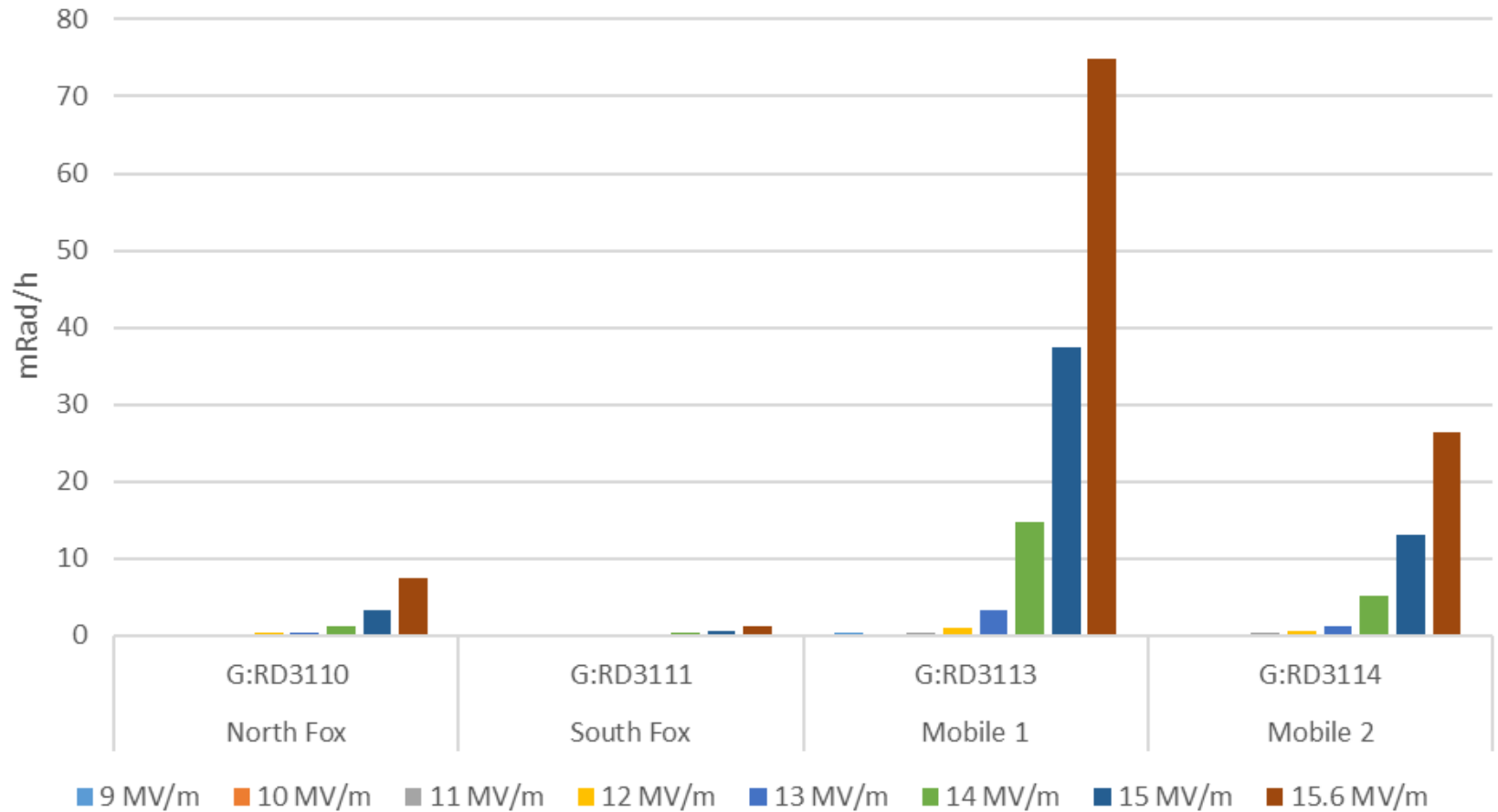
Fr-15-Dec-17



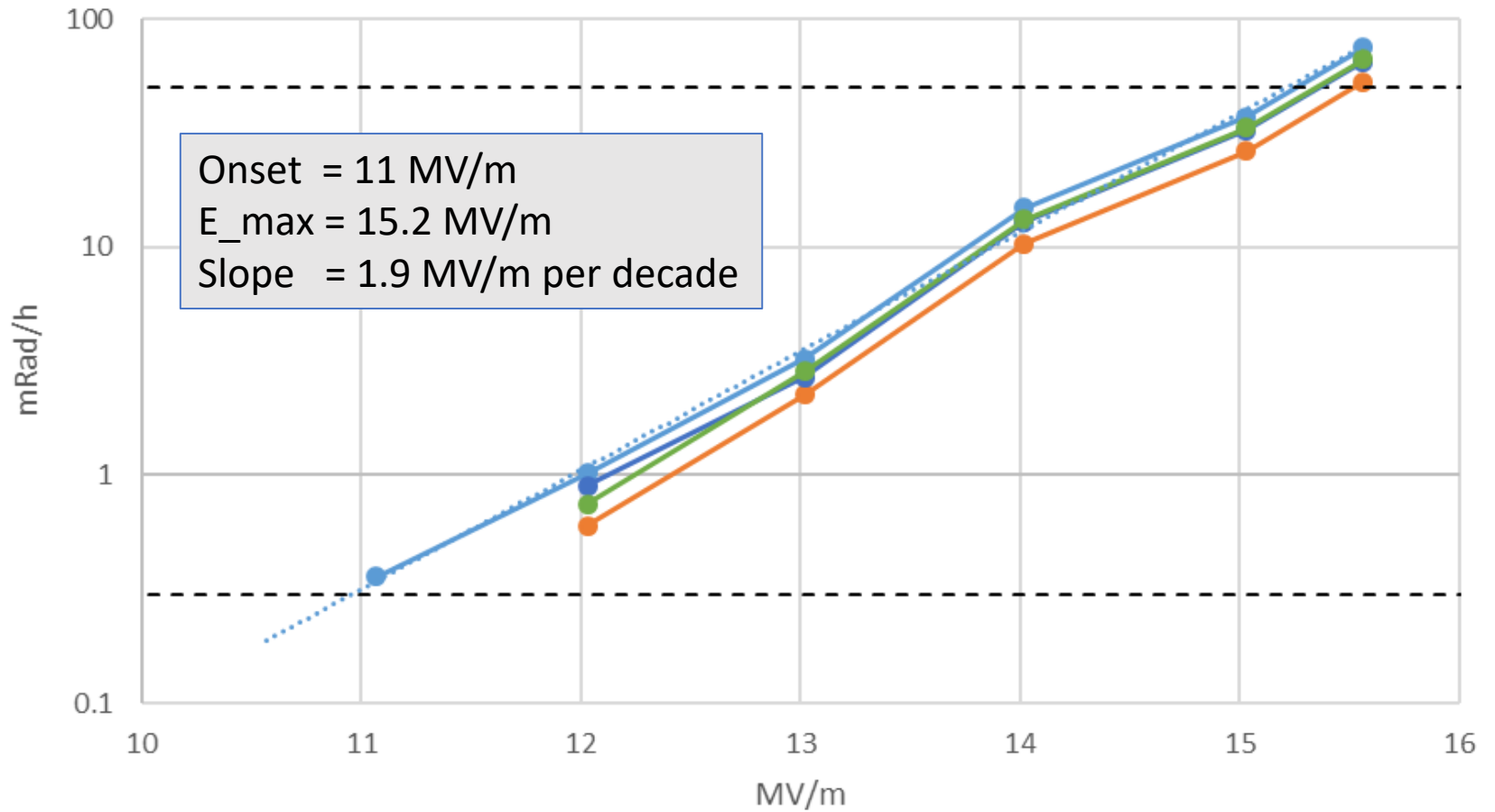
F1.3-05 Cavity 2 (CW)



F1.3-05 Cavity 2 (CW)



F1.3-05 Cavity 2 (CW)

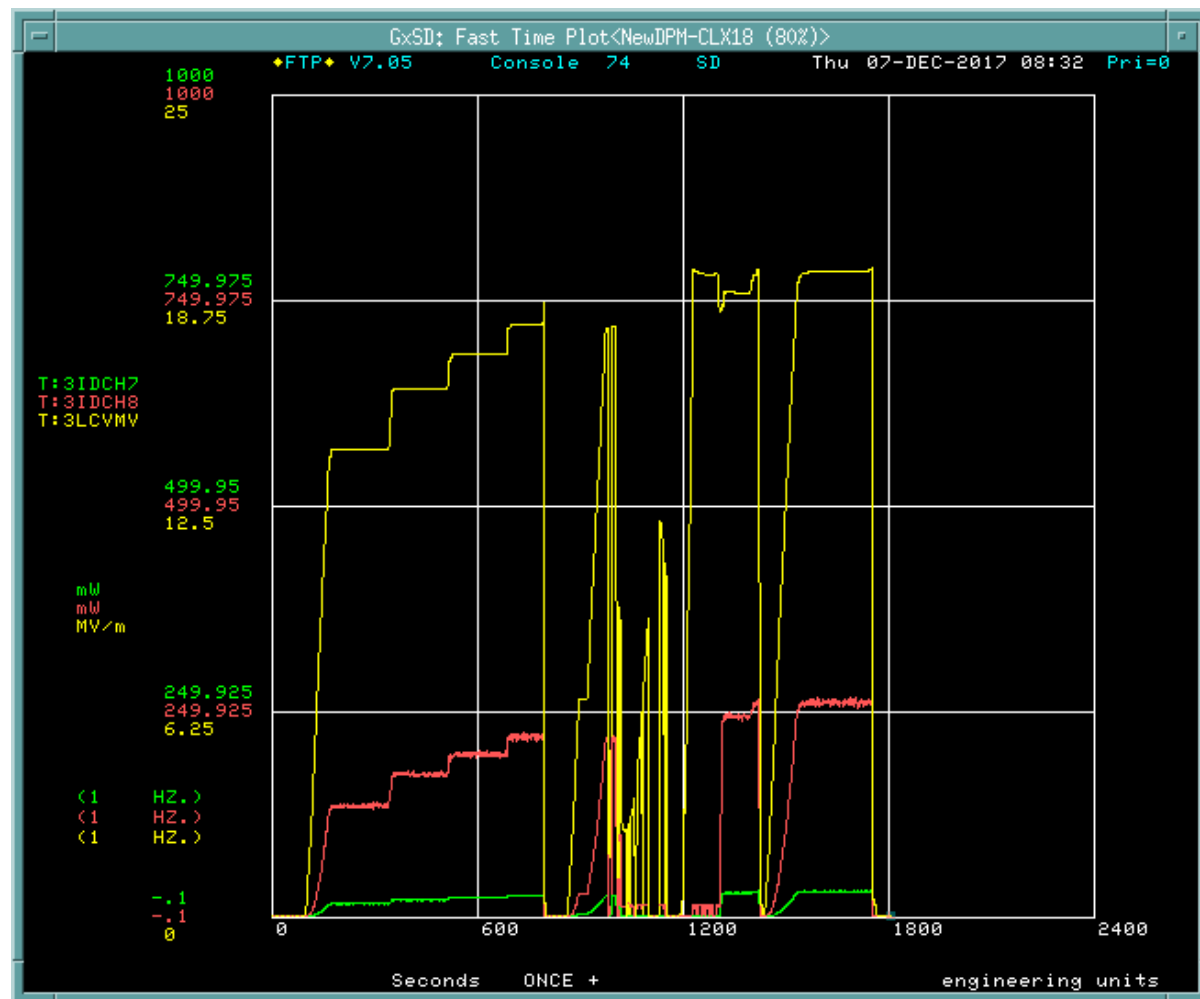


● Mobile 1 ● Wall 2 ● Wall 4 ● Wall 3 Expon. (Mobile 1)

F1.3-05

Cavity 3

Th-07-Dec-17



F1.3-05, Cav3

Cavity 3 testing underwent three phases:

ph1) 8:35 – 8:46: gradient ramp

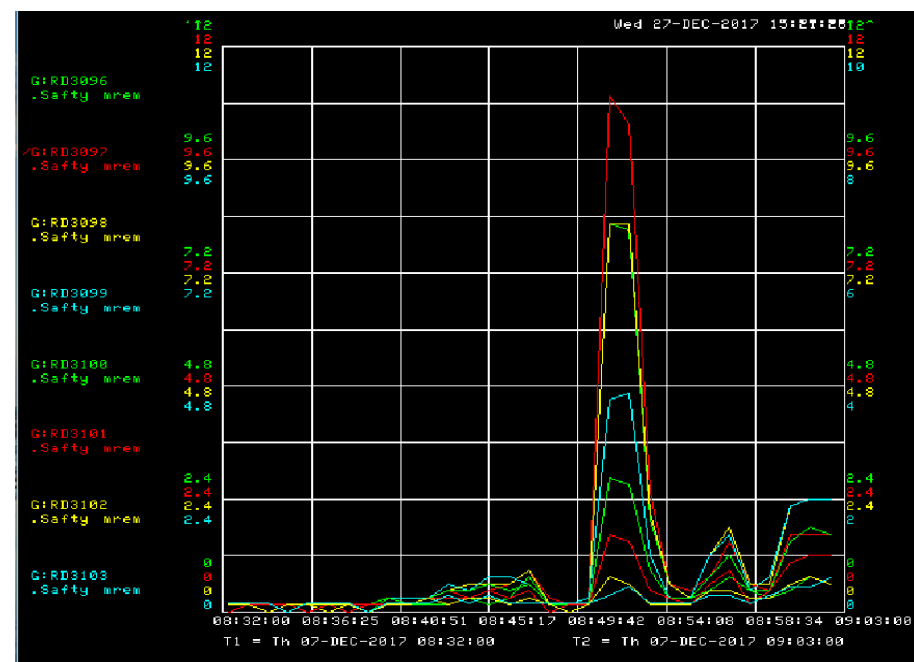
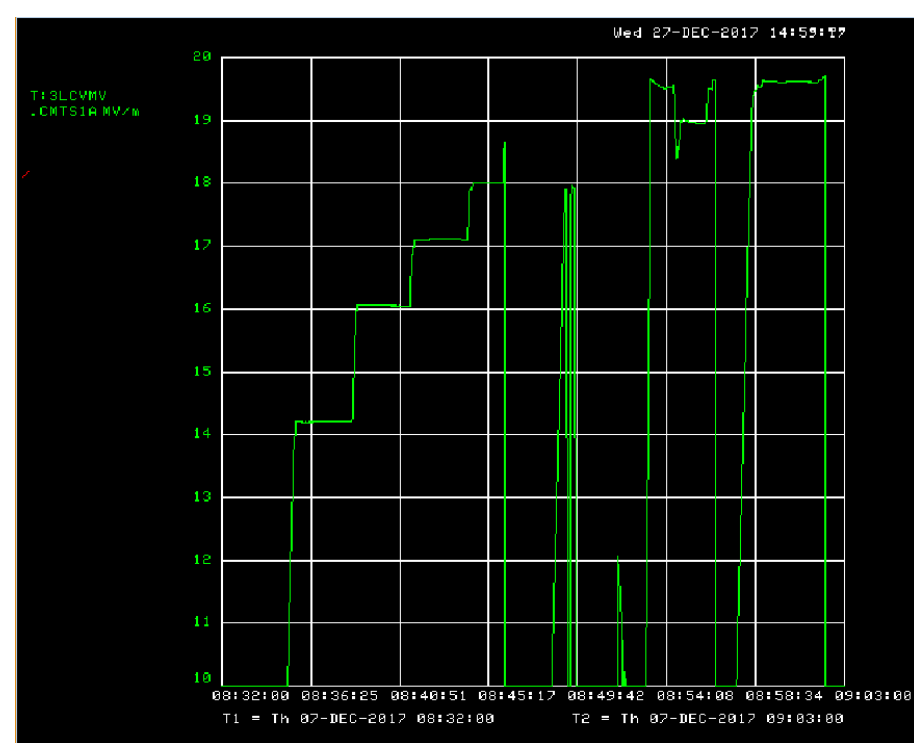
with very small FE

ph2) 8:46 – 8:53: RF conditioning

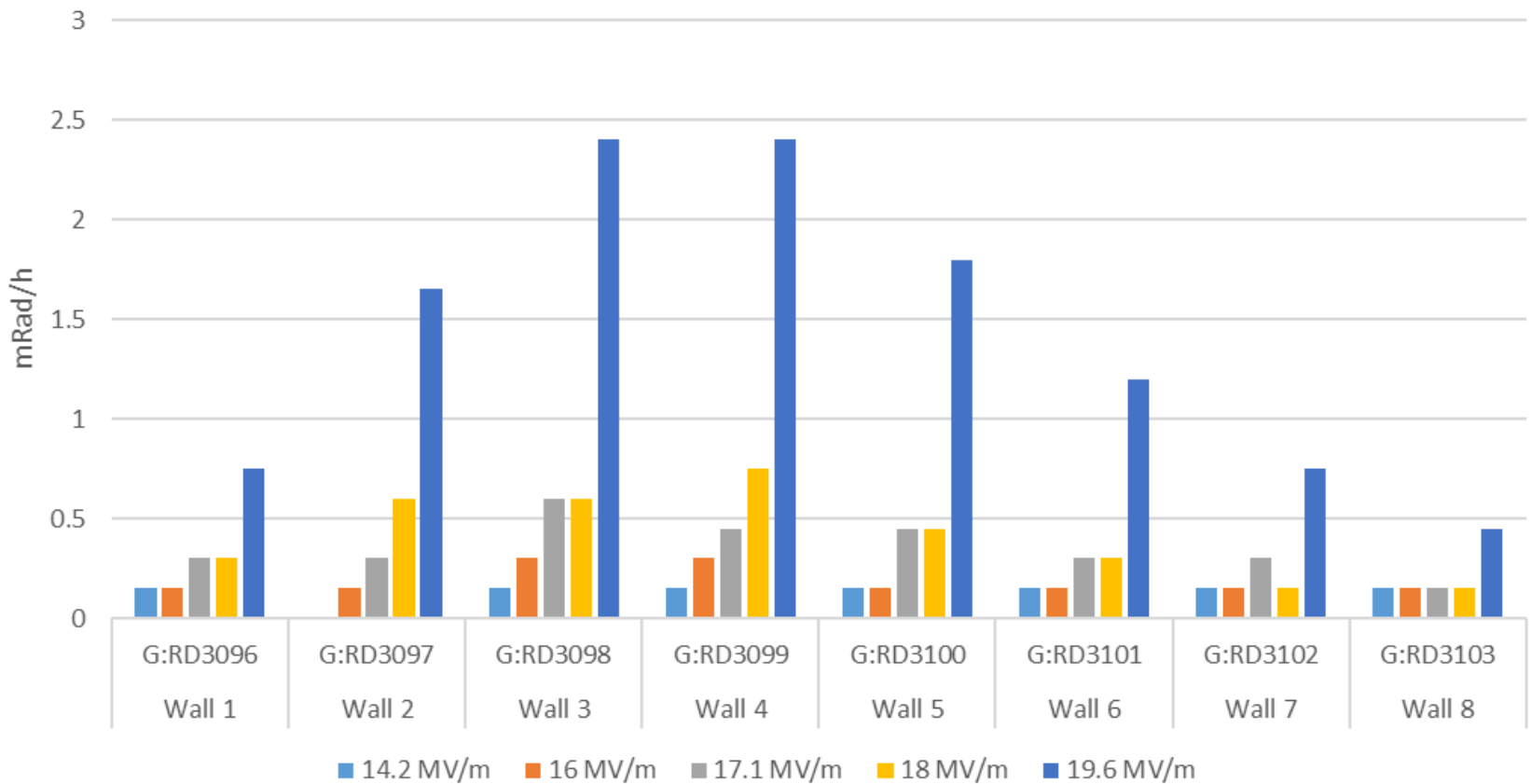
with high FE (MP ?)

ph3) 8:53 – 9:02: at 19.6 MV/m

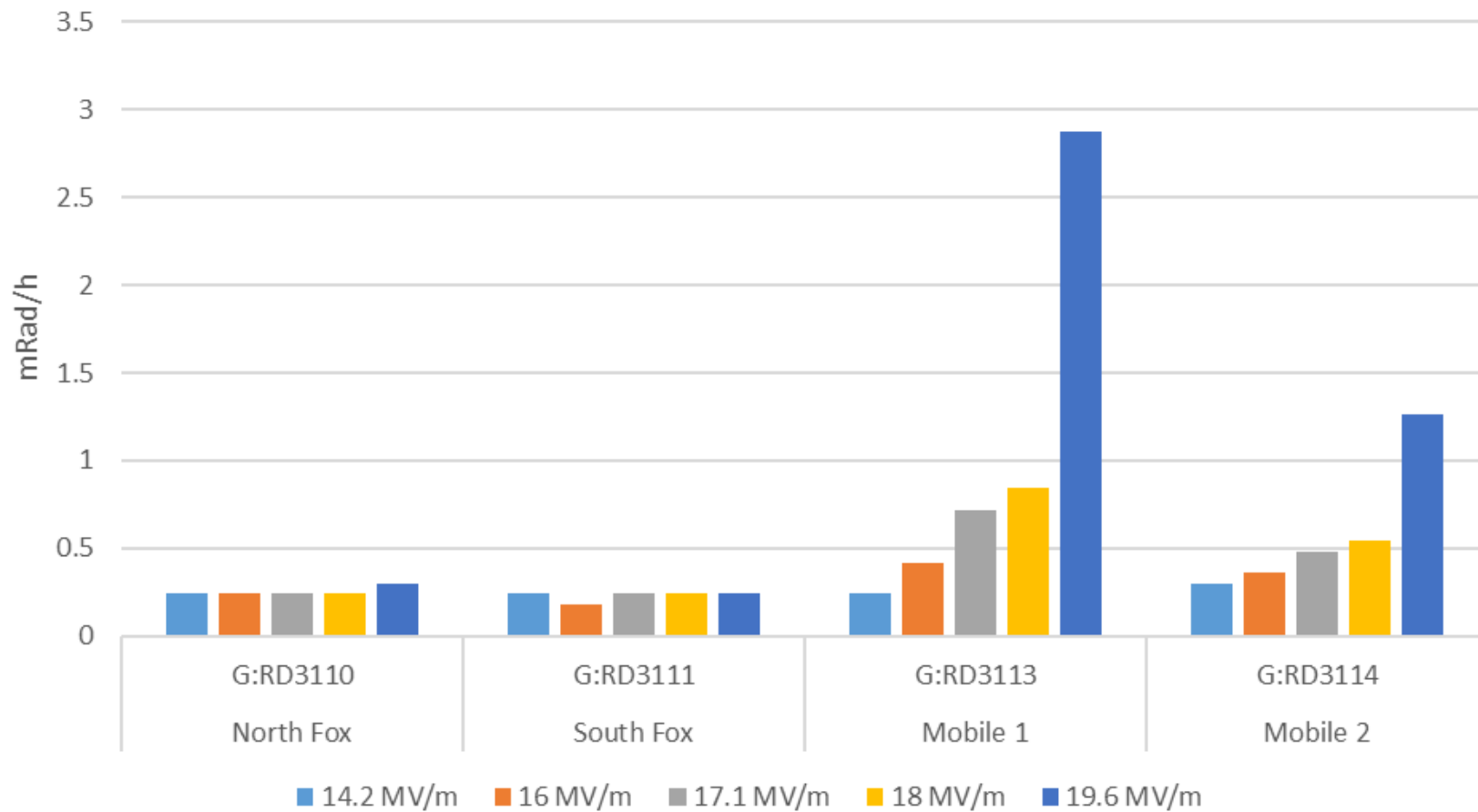
with small FE



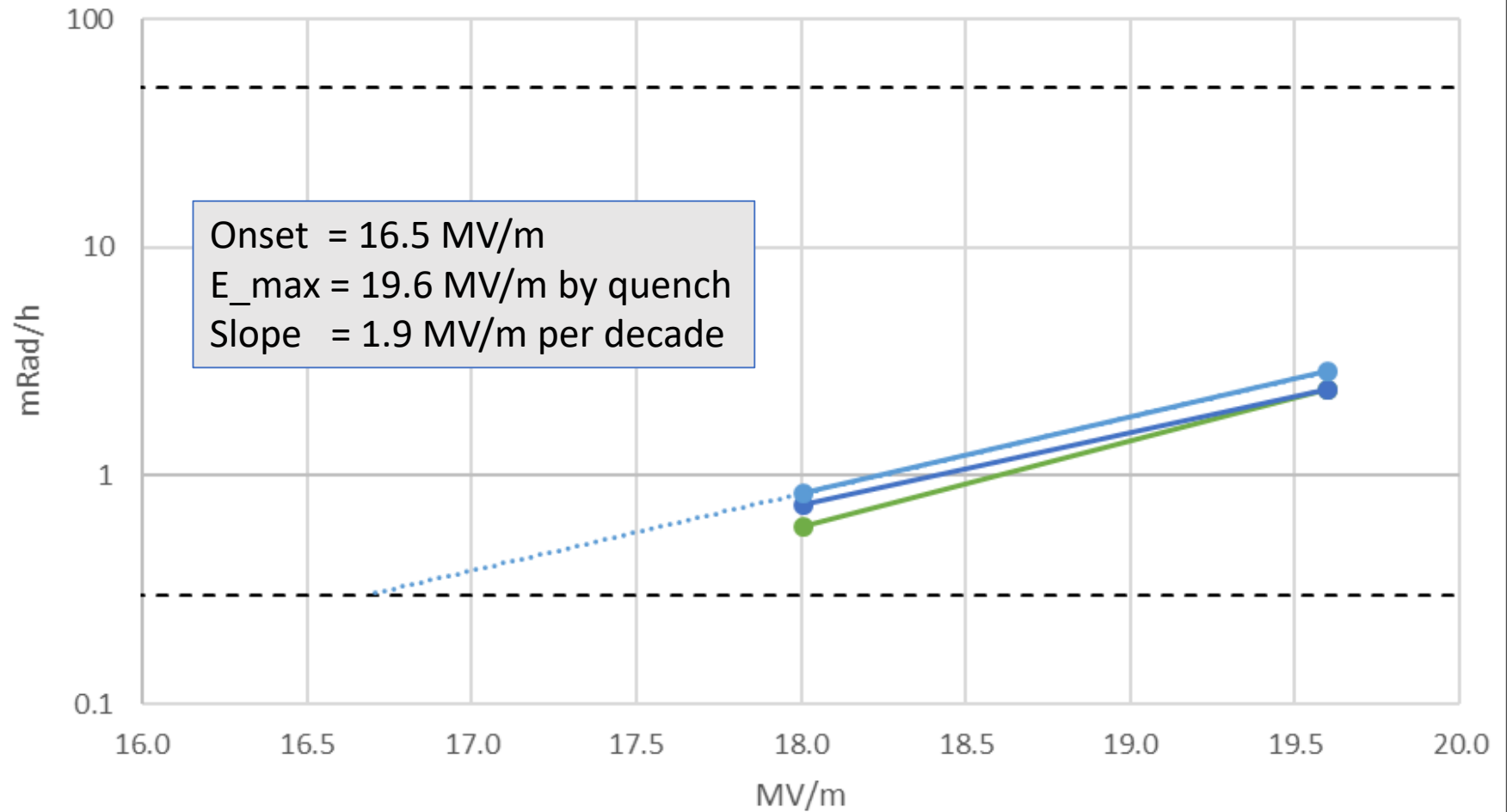
F1.3-05 Cavity 3 (CW)



F1.3-05 Cavity 3 (CW)



F1.3-05 Cavity 3 (CW)



—●— Wall 3 —●— Wall 4 —●— Mobile 1 Expon. (Mobile 1)

F1.3-07 performance

Cavity	VTS			CMTF Test	Max** Gradient [MV/m]	Usable Gradient** [MV/m]	FE onset [MV/m]	Q0 @16MV/m 2K @ 70 G/s	Q0 @16MV/m 2K @ 1. G/s	Q0 @16MV/m 2K @ 75G/s	Q0 @16MV/m 2K @ 83G/s	Material
	Eacc* [MV/m]	FE onset	Q0@16M V/m									
CAV0058	21.8	No	3.34E+10	20	20.0	none	3.29E+10	2.41E+10	3.20E+10	3.67E+10	TD, 200/900	
CAV0084	21.5	No	3.06E+10	21	21.0	none	2.64E+10	2.96E+10	2.71E+10	2.98E+10	NX-B, 200/900	
CAV0098	25.5	no	2.89E+10	21	21.0	none	1.94E+10	2.35E+10	2.15E+10	2.38E+10	NX-A, 200/900	
CAV0091	21.1	no	2.79E+10	20.8	20.8	none	1.60E+10	2.16E+10	1.82E+10	1.89E+10	NX-A, 200/900	
CAV0111	21.5	no	2.76E+10	18	18.0	none	1.74E+10	2.25E+10	2.04E+10	2.08E+10	NX-A, 200/900	
CAV0262	27	24.0	2.94E+10	21	21.0	none	2.53E+10	2.27E+10	3.18E+10	3.07E+10	TD, 200/900	
CAV0108	26.5	no	2.48E+10	20.5	20.5	none	1.94E+10	2.15E+10	2.15E+10	2.18E+10	NX-A, 200/900	
CAV0076	19.8	No	2.62E+10	18.8	18.8	none	2.27E+10	2.66E+10	2.50E+10	2.50E+10	NX-B, 200/900	
Average	23.1		2.86E+10	20.1	20.1		2.24E+10	2.40E+10	2.47E+10	2.59E+10		
Total Voltage	191.7				167.2							

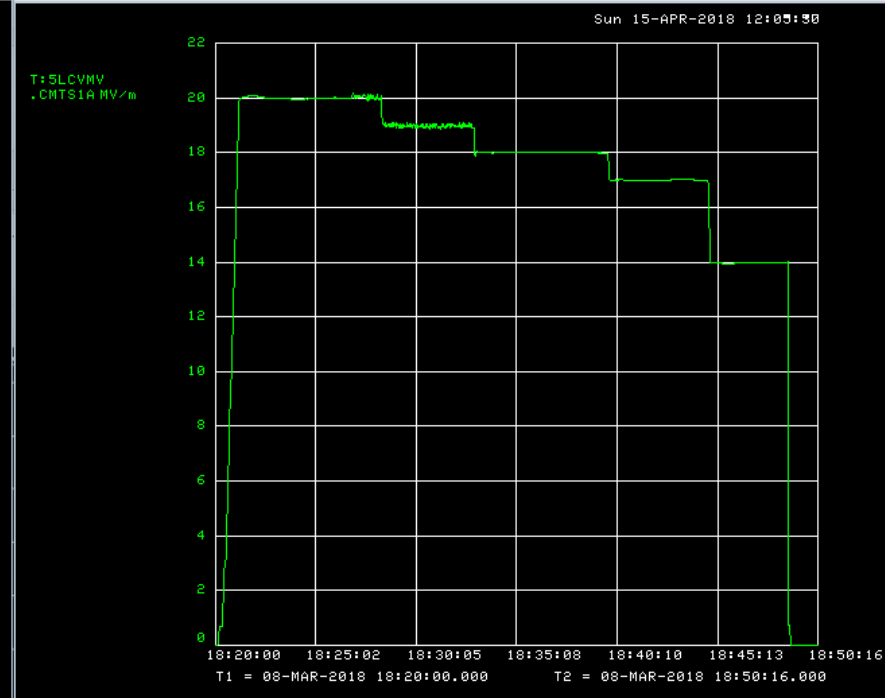
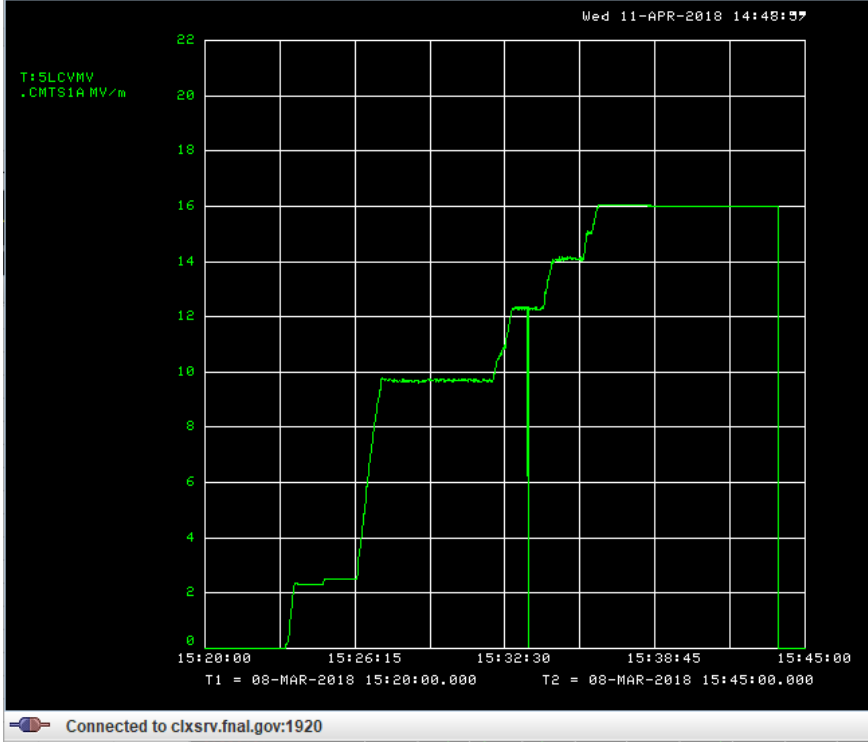
*No VTS administrative limit

**21 MV/m is CMTF administrative limit

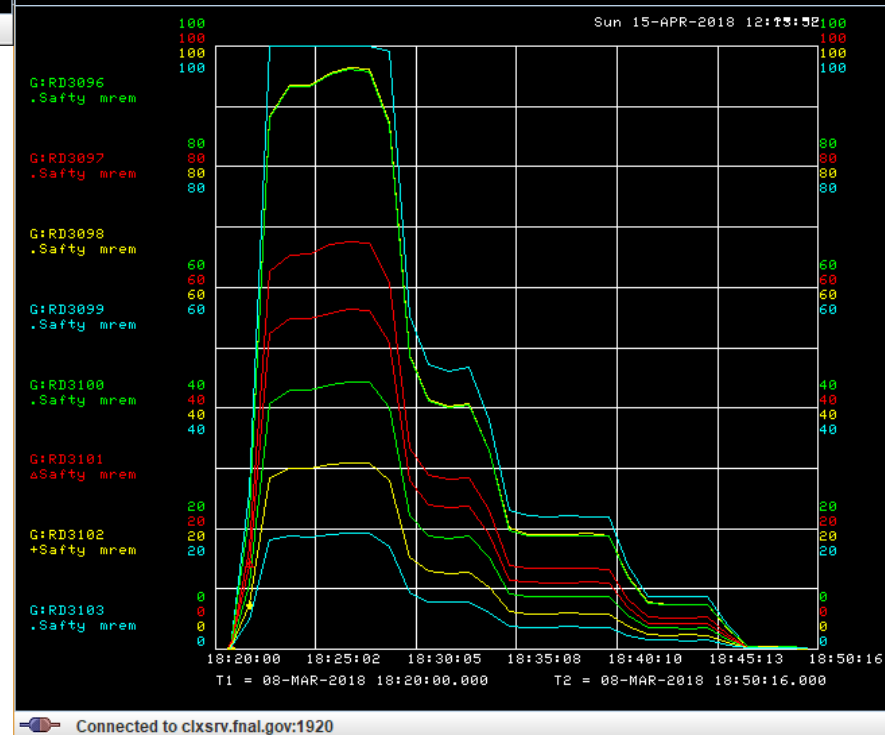
***50mR/h wall radiation detector

F1.3-09

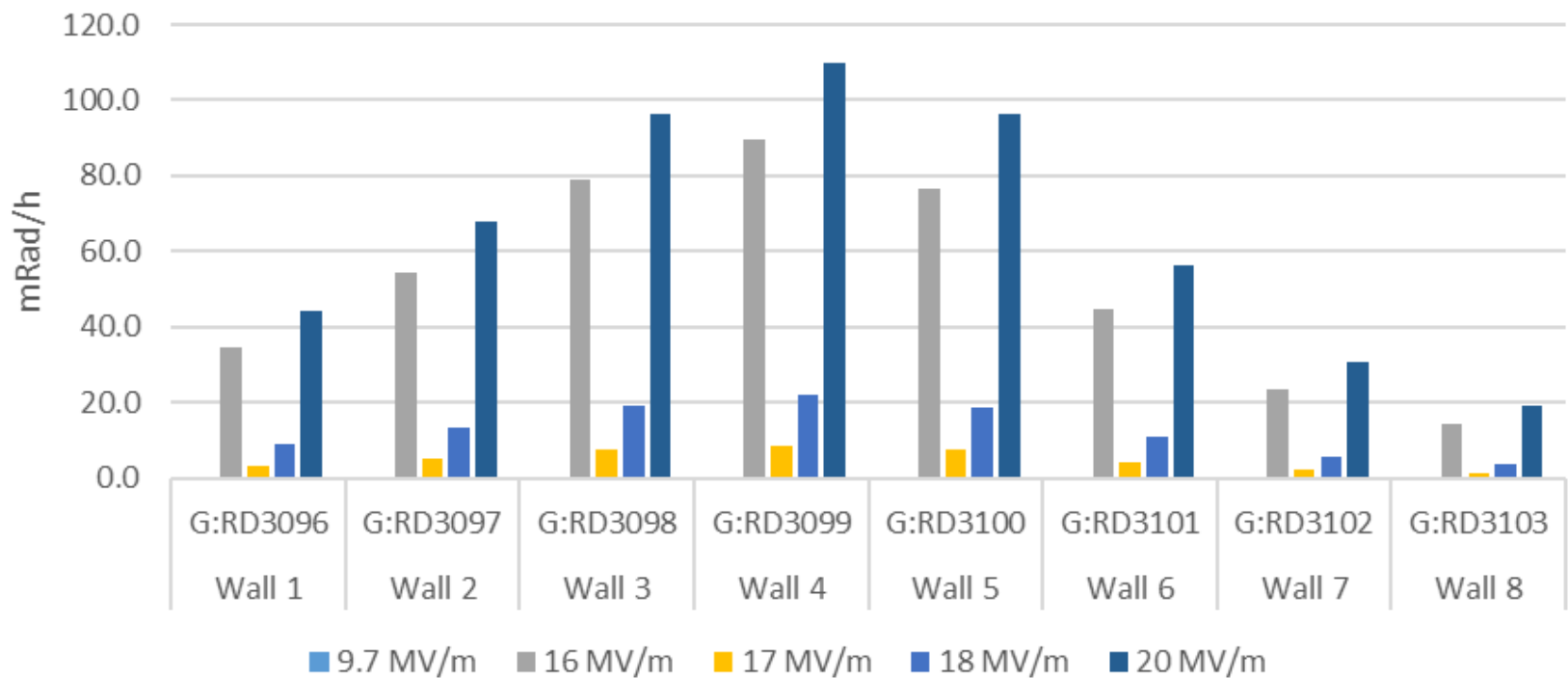
Cavity	VTS			CMTF Test		
	Eacc* [MV/m]	FE onset	Q0@16MV/m	Max** Gradient [MV/m]	Usable Gradient*** [MV/m]	FE onset [MV/m]
CAV0127	24.5	no	3.28E+10	21	21.0	none
CAV0291	26.5	no	3.45E+10	21	21.0	none
CAV0126	25	no	3.62E+10	21	21.0	none
CAV0107	21.3	no	3.76E+10	21	21.0	none
CAV0282	27.5	no	3.79E+10	21	19.0	12.3
CAV0275	24.6	23.5	3.49E+10	20.7	20.0	14
CAV0283	24.3	no	3.53E+10	21	21.0	none
CAV0277	20.9	19.5	3.43E+10	21	21.0	16.2
Average	24.3		3.54E+10	21.0	20.6	
Total Voltage	202.0				171.3	



F1.3-09
Cavity 5
Fr-08-Mar-18

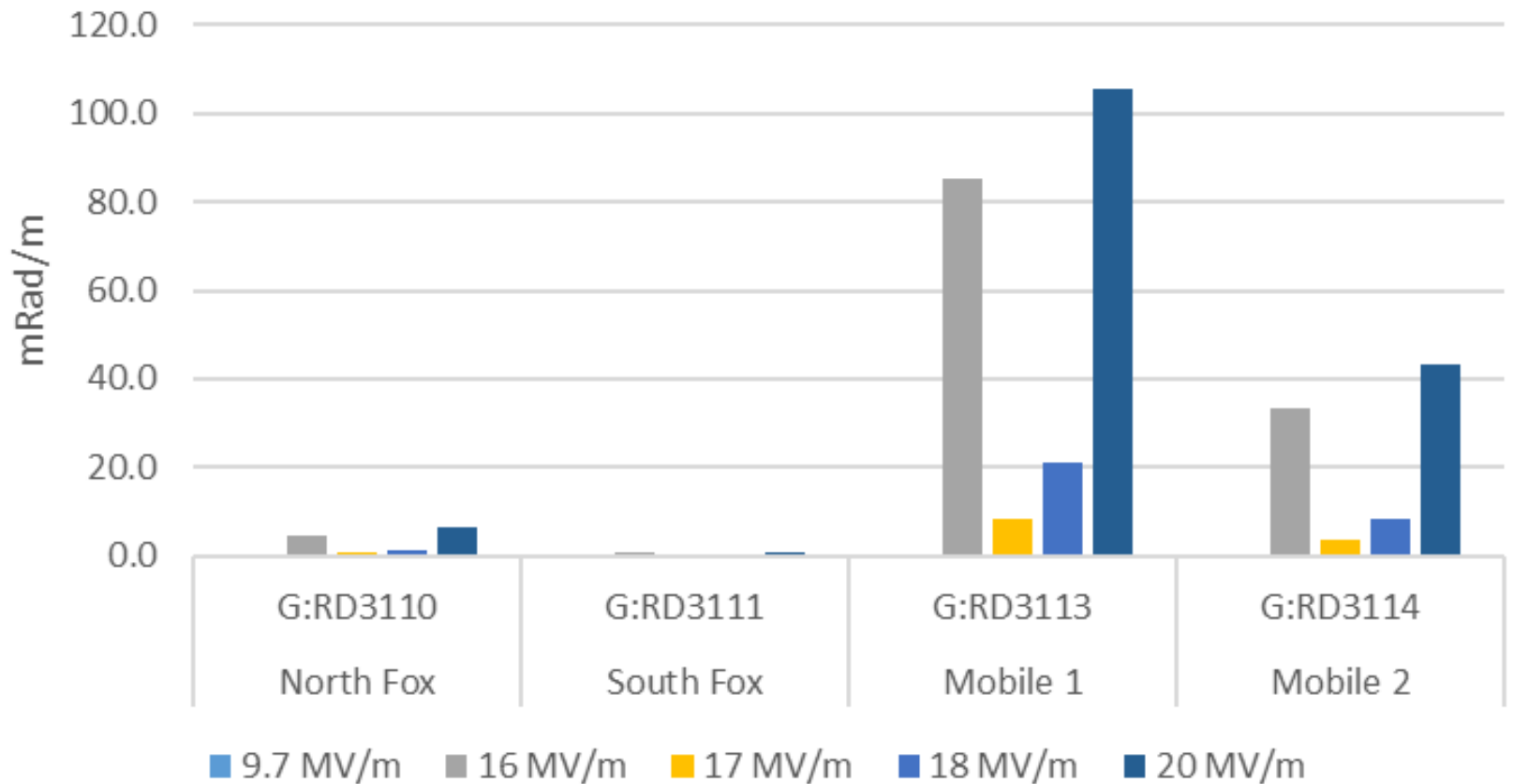


F1.3-09 Cavity 5 (CW)



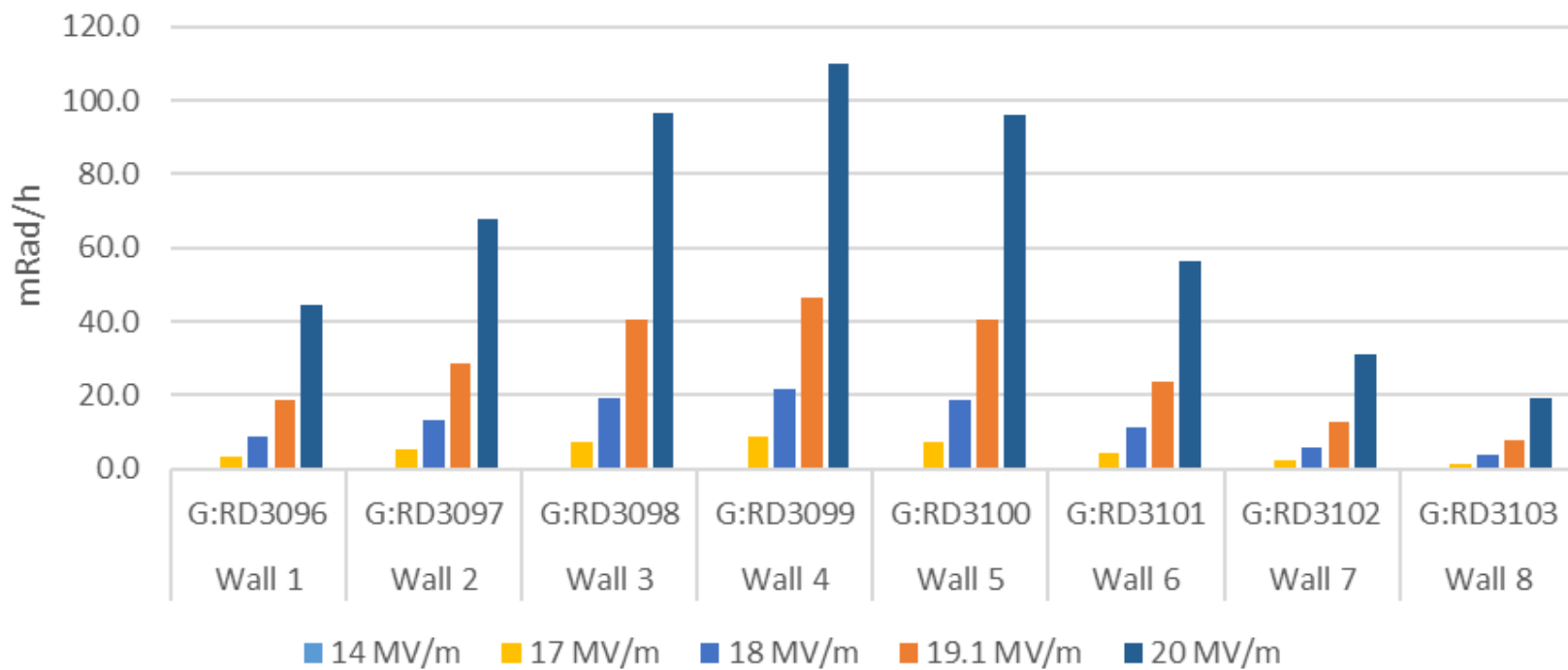
The data at 16 MV/m was obtained earlier during the field ramp up

F1.3-09 Cavity 5 (CW)

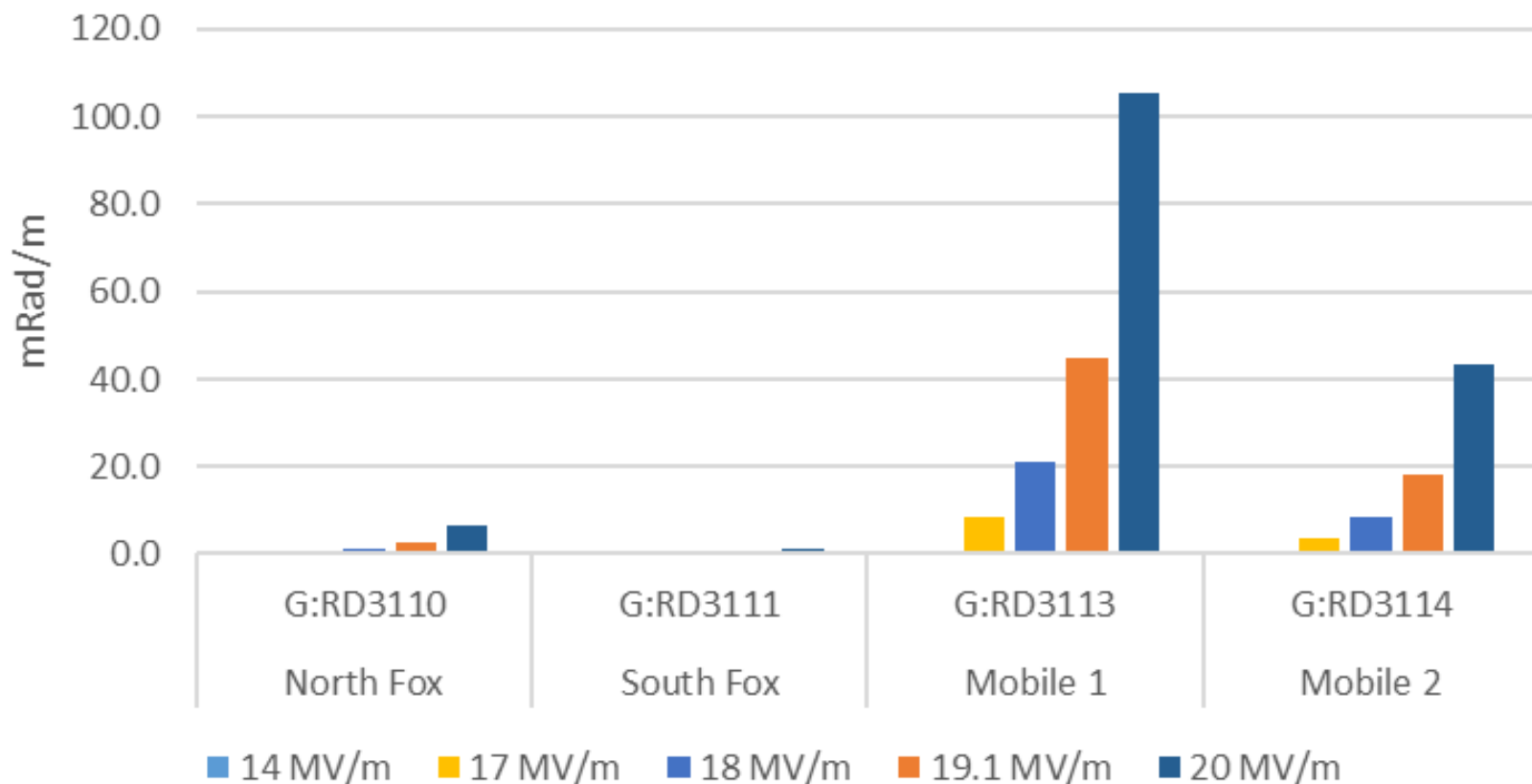


The data at 16 MV/m was obtained earlier during the field ramp up

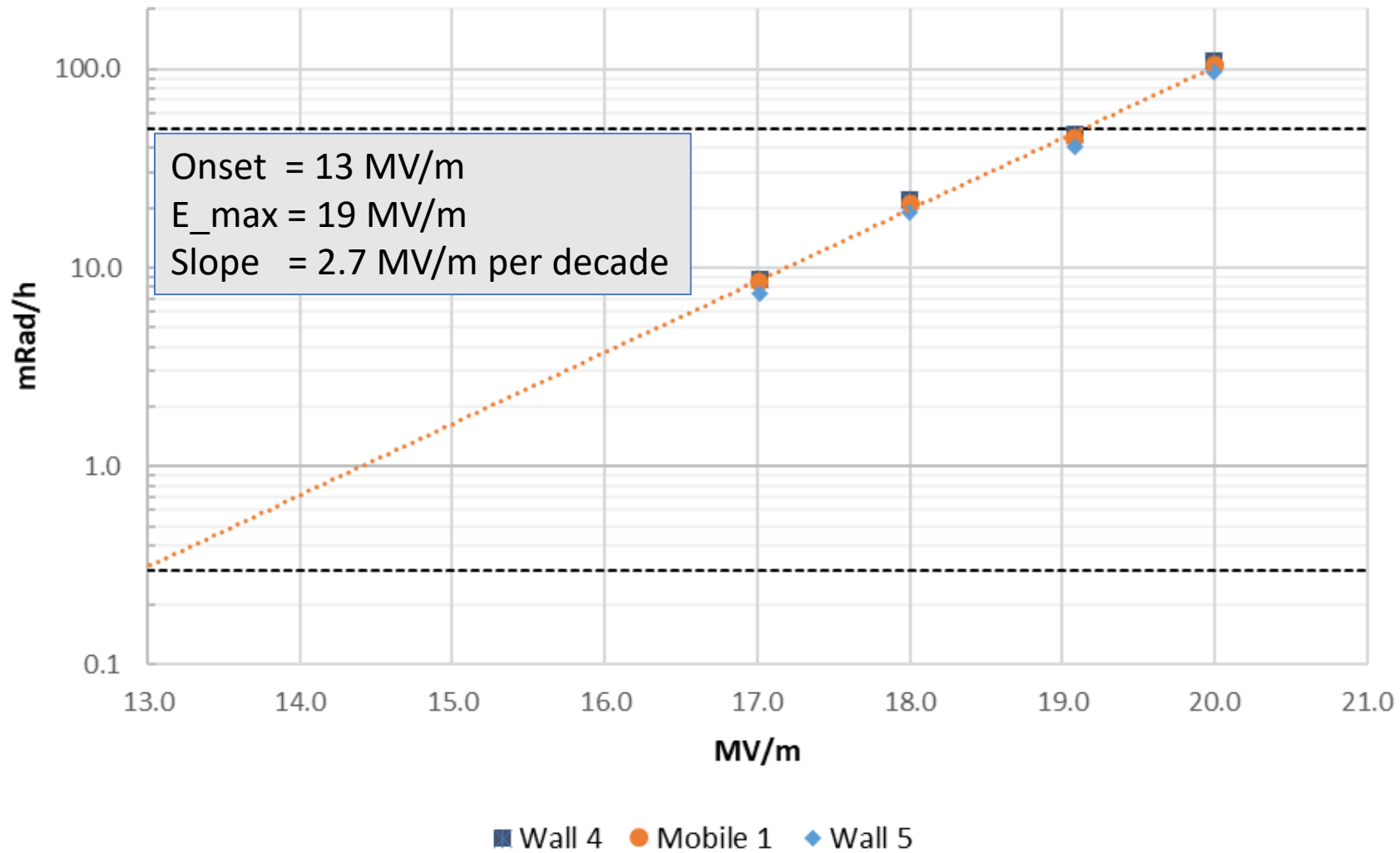
F1.3-09 Cavity 5 (CW)



F1.3-09 Cavity 5 (CW)



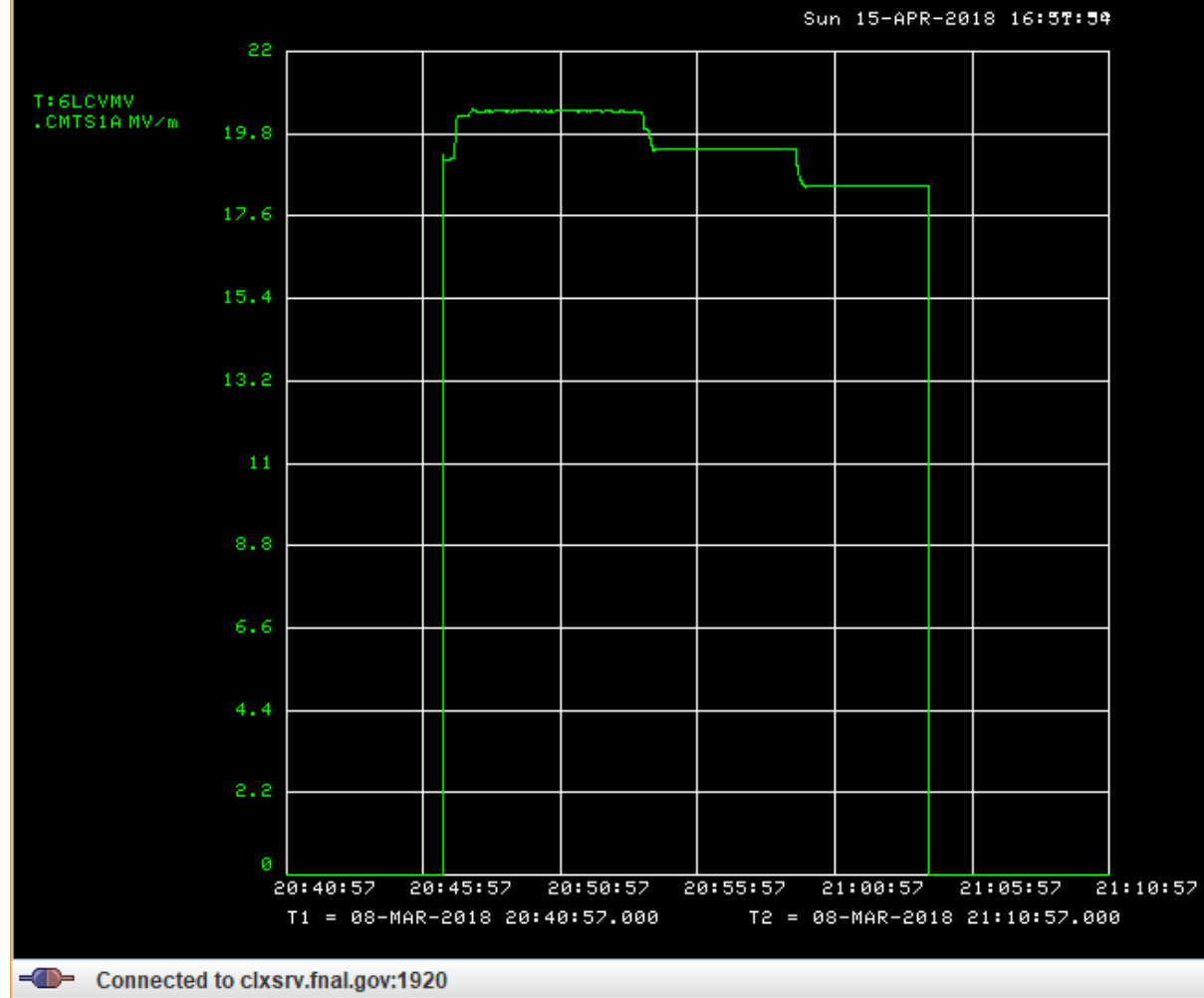
F1.3-09 Cavity 5 (CW)



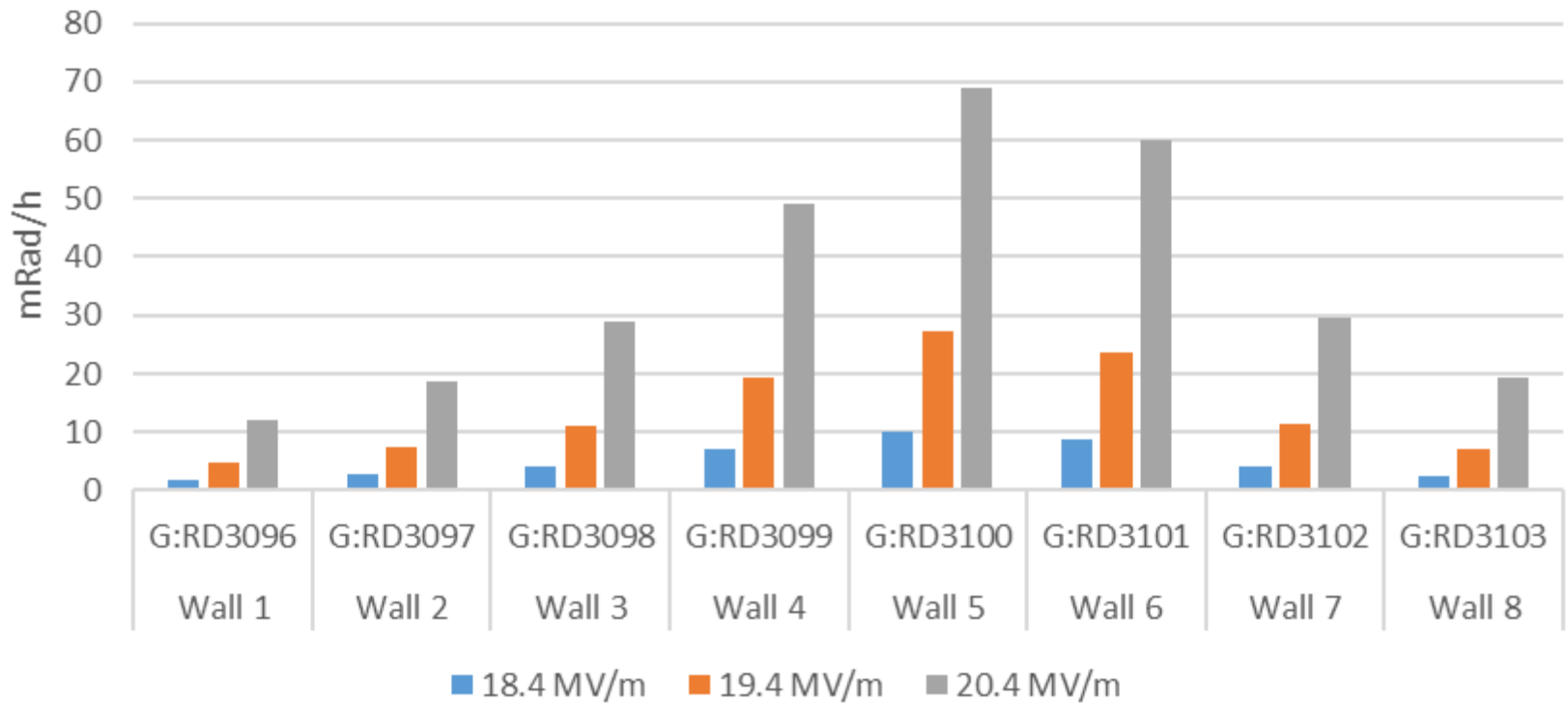
F1.3-09

Cavity 6

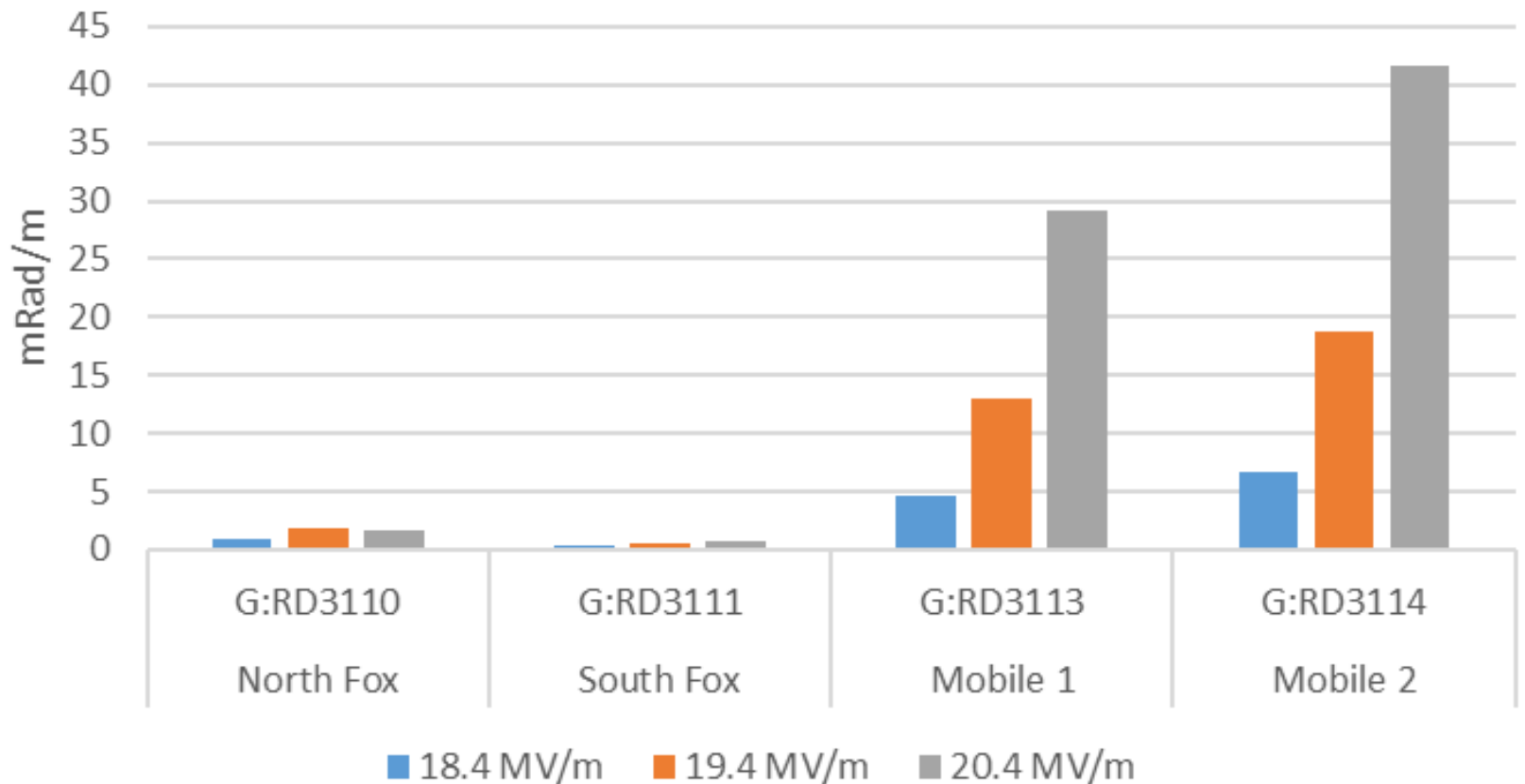
Fr-08-Mar-18



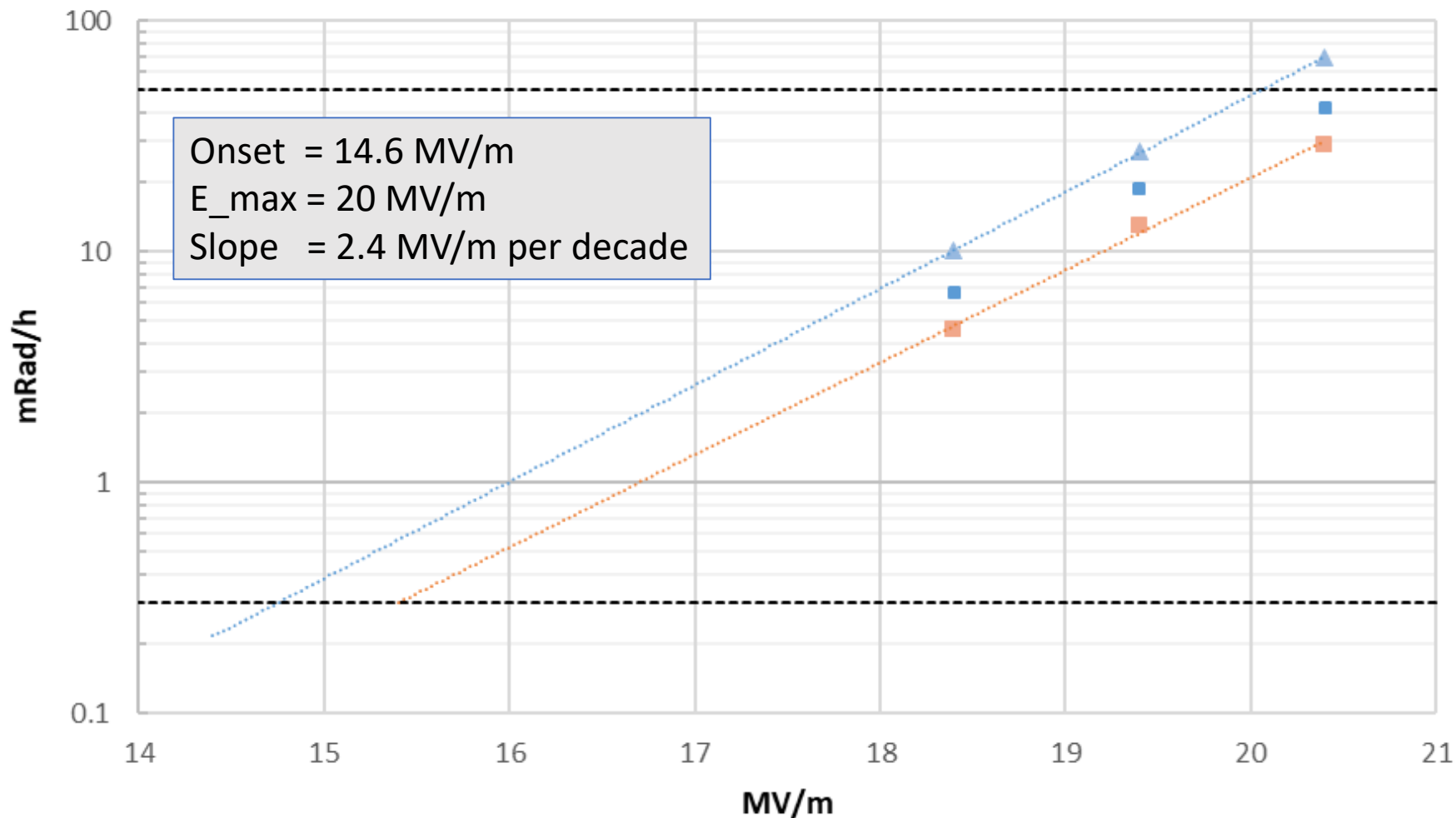
F1.3-09 Cavity 6 (CW)



F1.3-09 Cavity 6 (CW)



F1.3-09 Cavity 6 (CW)

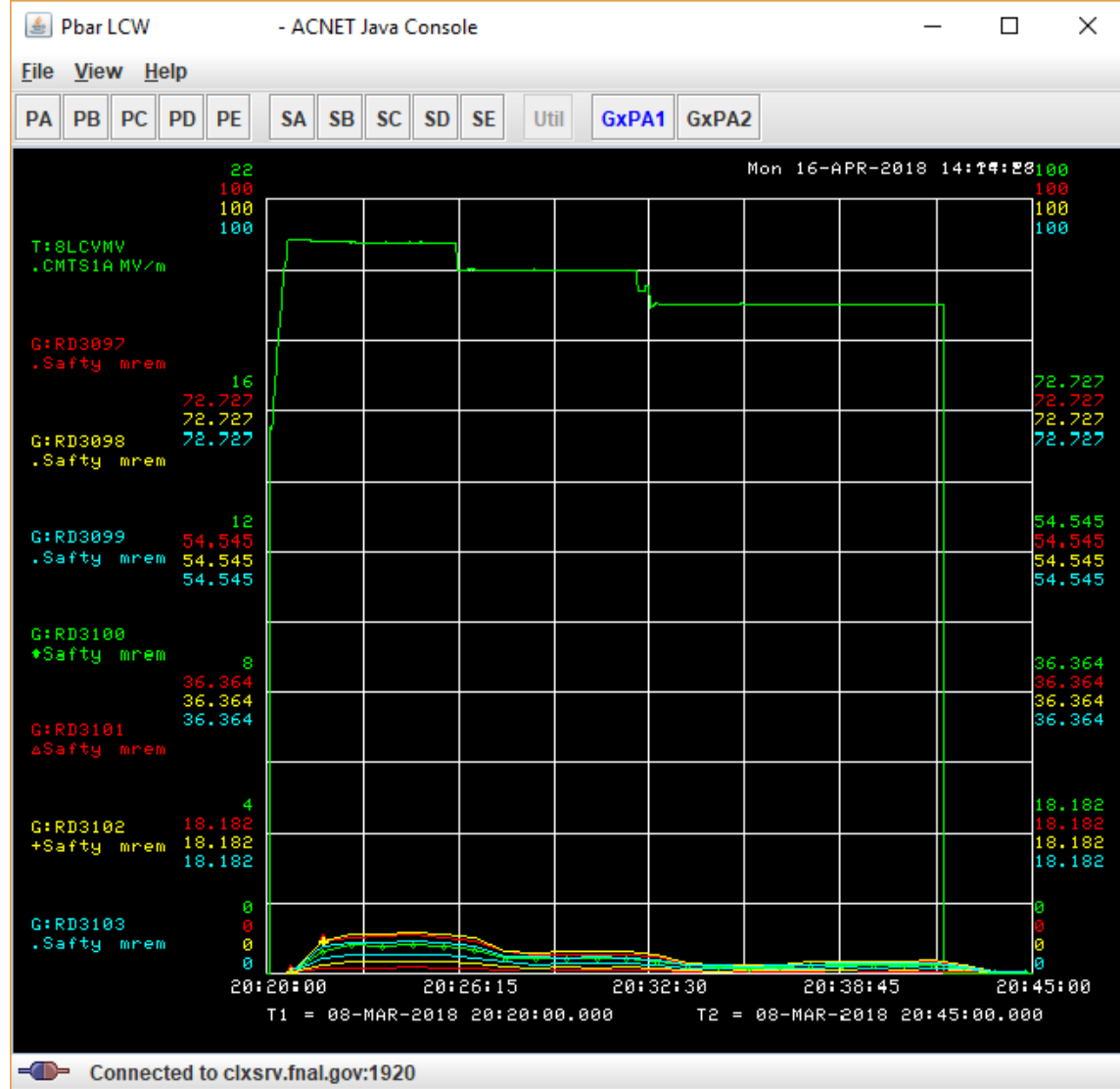


▲ Wall 5 ■ Mobile 1 ■ Mobile 2

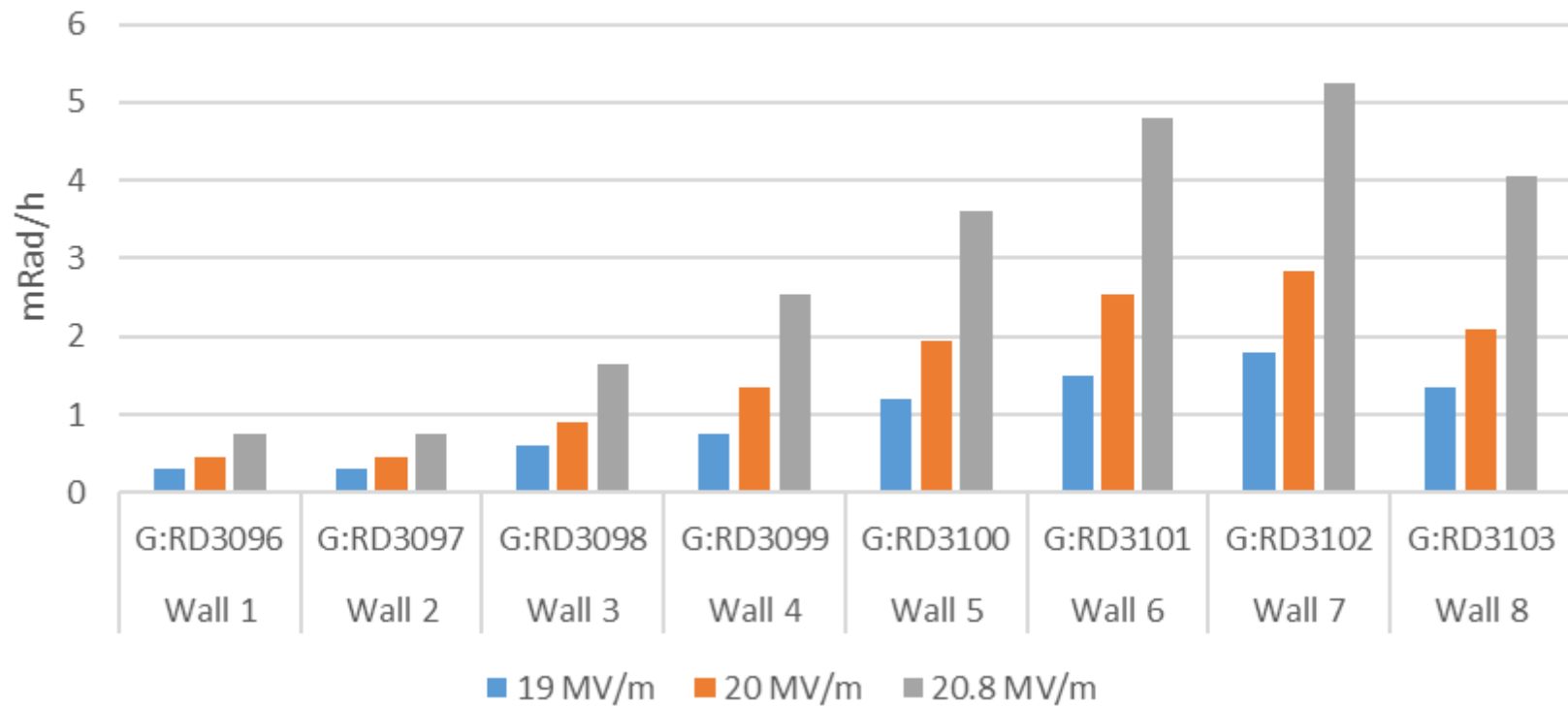
F1.3-09

Cavity 8

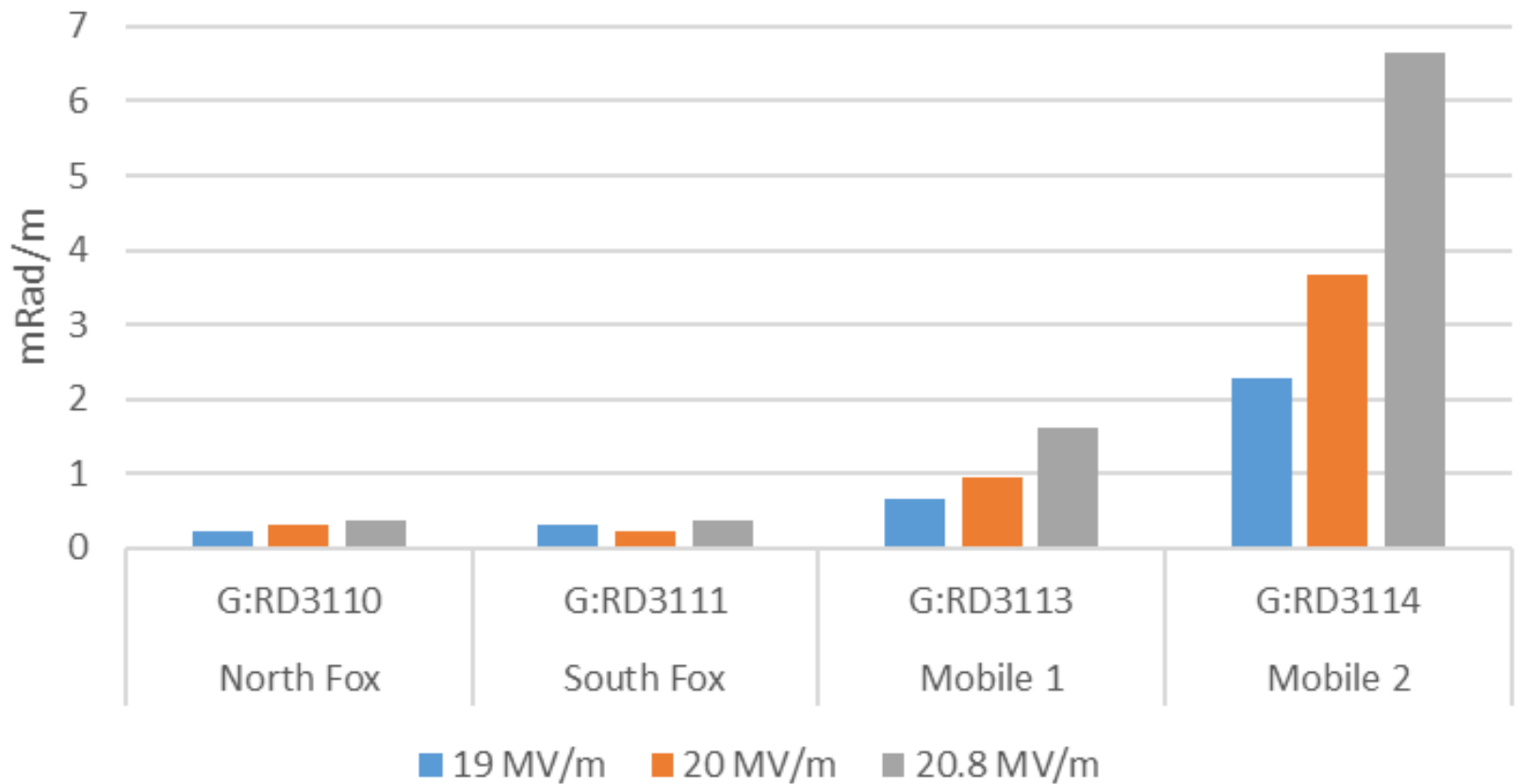
Fr-08-Mar-18



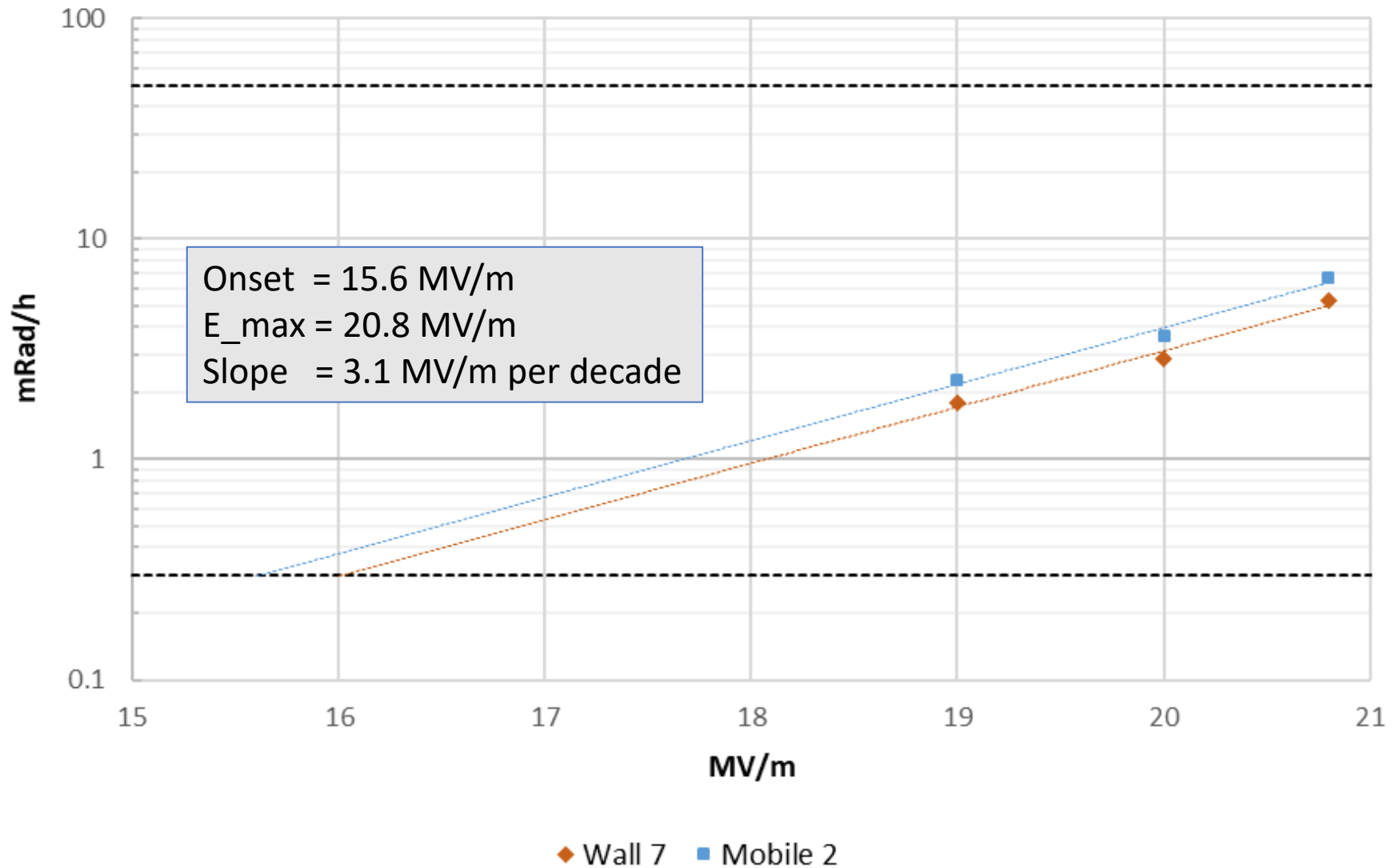
F1.3-09 Cavity 8 (CW)



F1.3-09 Cavity 8 (CW)



F1.3-09 Cavity 8 (CW)



F1.3-08 performance

Cavity	VTS			CMTF Test					
	Eacc* [MV/m]	FE onset	Q0@16MV/ m	Max** Gradient [MV/m]	Usable Gradient** * [MV/m]	FE onset [MV/m]	Q0 @16MV/m 2K @ 80 g/s	Q0 @16MV/m 2K @ 80 g/s do-over	Material
CAV0117	20.9		2.8E+10	19.7	19.7	none	1.94E+10	2.25E+10	NX-A, EGS C, 200/950
CAV0092	25.5		2.7E+10	20.5	20.5	none	1.35E+10	1.78E+10	NX-A, 200/900
CAV0121	25.5		2.8E+10	20.7	20.7	none	1.97E+10		NX-A, 200/900
CAV0274	23.3		3.E+10	18	18	none	3.03E+10		NX-B, 200/950
CAV0266	27.8		2.9E+10	20.8	20.8	none	2.49E+10	2.57E+10	TD, 200/900
CAV0269	23		2.8E+10	19	19	none	3.00E+10		TD, 200/900
CAV0100	18.1		3.3E+10	18.7	18.7	none	4.08E+10	3.82E+10	NX-B, 200/950
CAV0093	25.5		2.6E+10	18.5	18.5	none	2.37E+10	2.19E+10	NX-A, 200/900
Average	23.7		2.86E+10	19.5	19.49		2.53E+10	2.52E+10	
Total Voltage	196.8			162					

*No VTS administrative limit

**21 MV/m is CMTF administrative limit

***50mR/h wall radiation detector

F1.3-10 performance

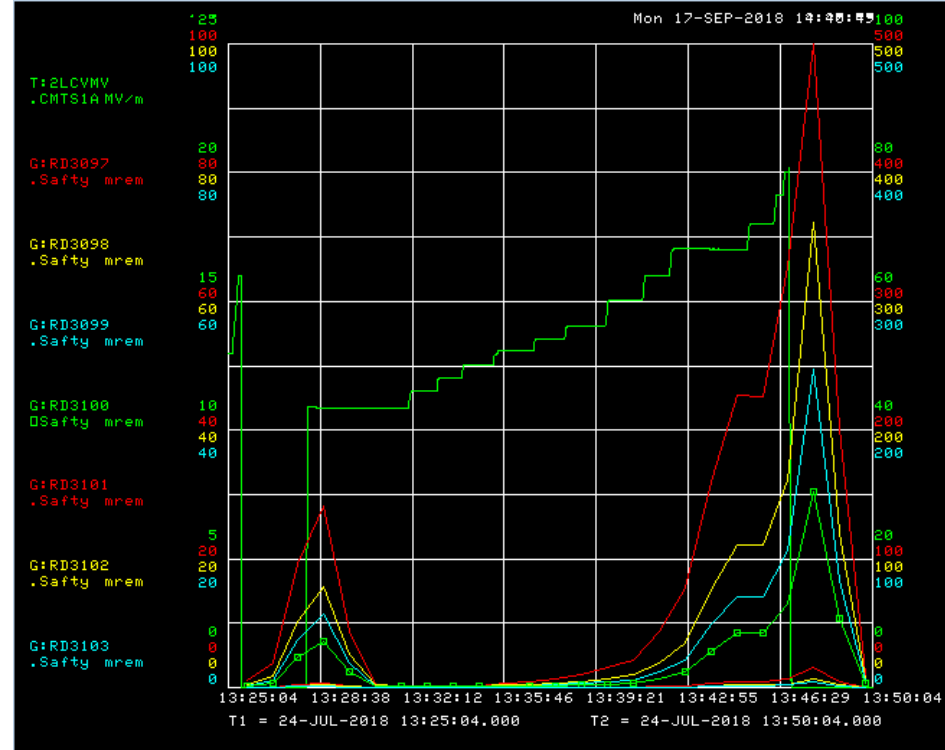
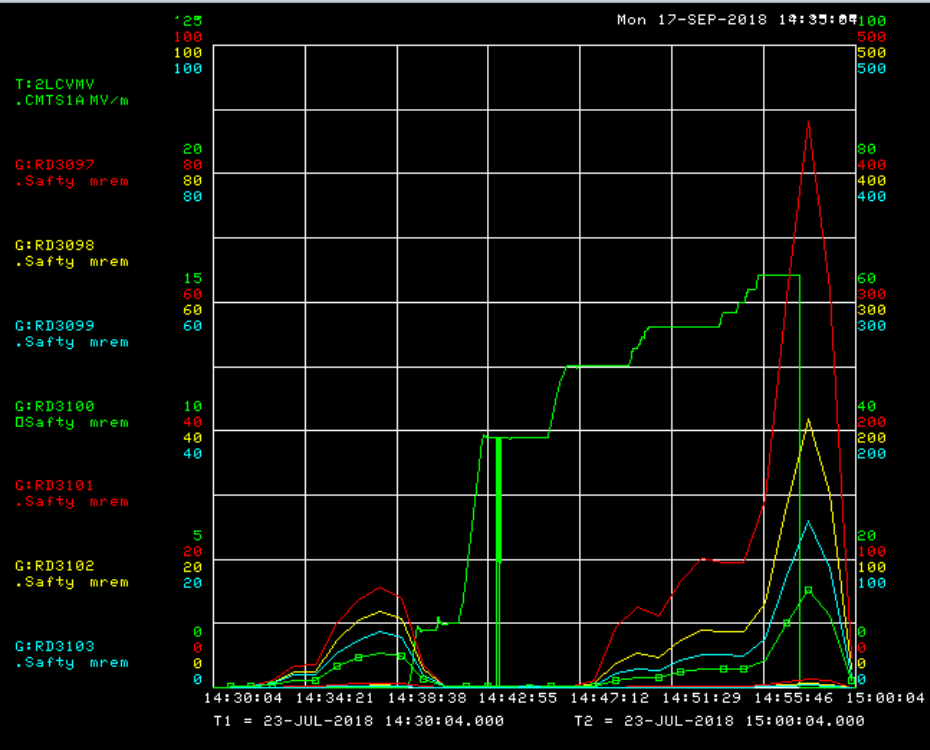
Cavity	VTS			CMTF Test				Material
	Eacc* [MV/m]	FE onset	Q0@16MV/m	Max** Gradient [MV/m]	Usable Gradient*** [MV/m]	FE onset [MV/m]	Q0 @16MV/m 2K @ 80 g/s	
CAV0312	20.5		2.9E+10	21	21	none [†]	2.65E+10	TD, 200/900
CAV0302	20.6		3.7E+10	19.8	16.4	12.5	2.41E+10	TD, 200/900
CAV0292	26.9		3.4E+10	21	21	none	3.12E+10	TD, 200/900
CAV0294	24.2		3.4E+10	21	21	21	2.83E+10	NX-B, 200/950
CAV0296	21.8		3.2E+10	21	21	16.5	2.59E+10	NX-A, 200/950
CAV0136	22		3.0E+10	20.9	20.4	none	2.66E+10	NX-C, 200/975
CAV0267	25.3		3.0E+10	20.6	20.1	none	2.58E+10	NX-A, 200/950
CAV0311	29		3.3E+10	21	21	none	2.74E+10	NX-B, 200/950
Average	23.8		3.24E+10	20.8	20.2		2.7E+10	
Total Voltage	197.5			172.6	168			

*No VTS administrative limit

**21 MV/m is CMTF administrative limit

***50mR/h wall radiation detector

[†]Cavity 1 initially exhibited FE onset of 12.6 MV/m even after processing; disappeared after thermal bump
Q0 measurements started 71 hours after thermal bump

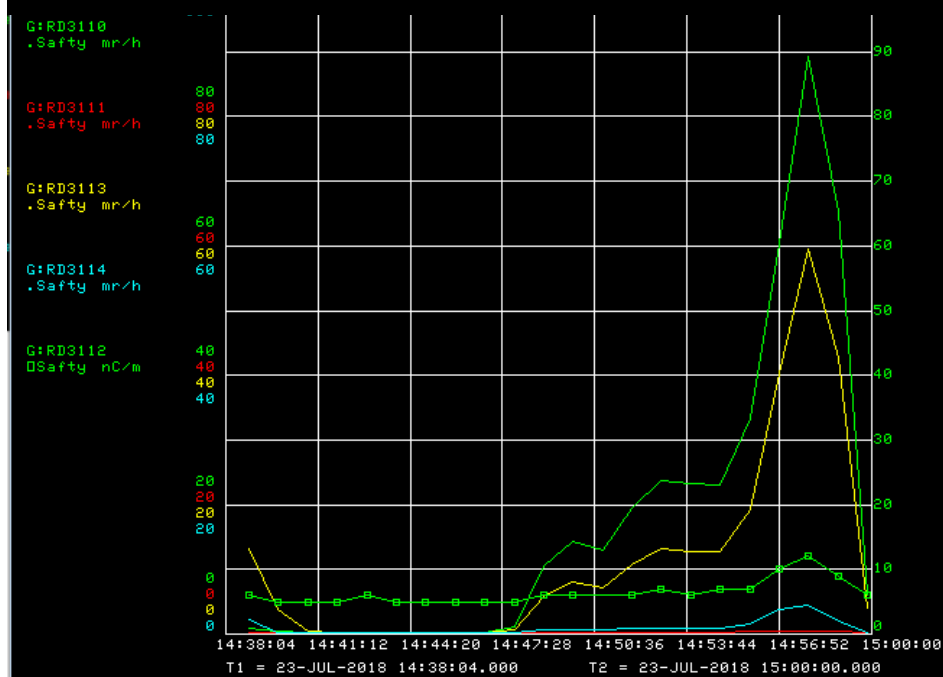
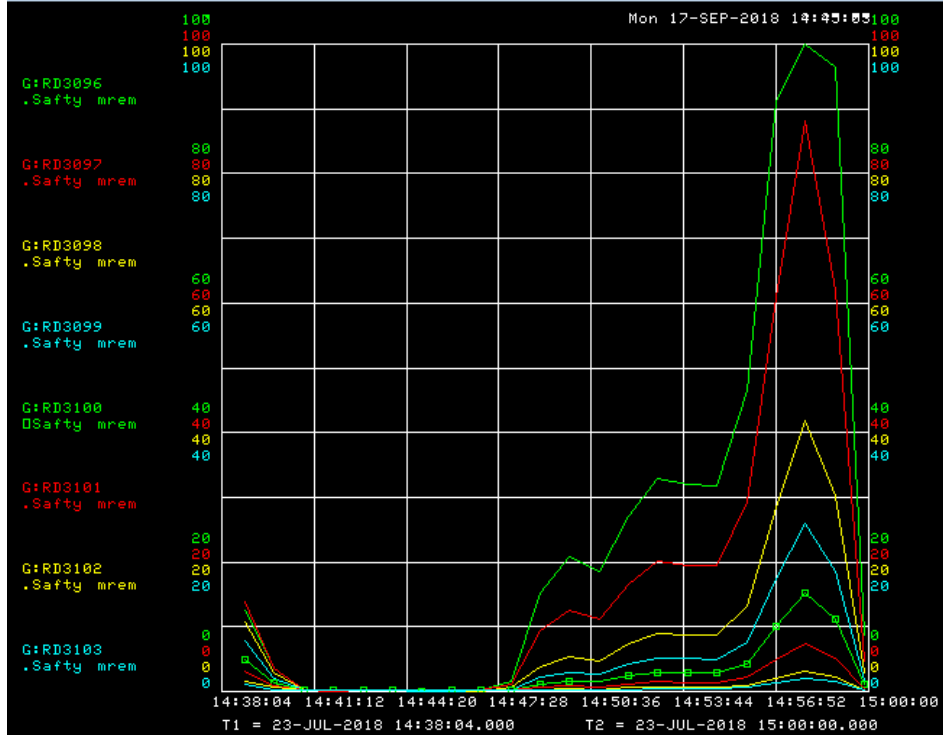
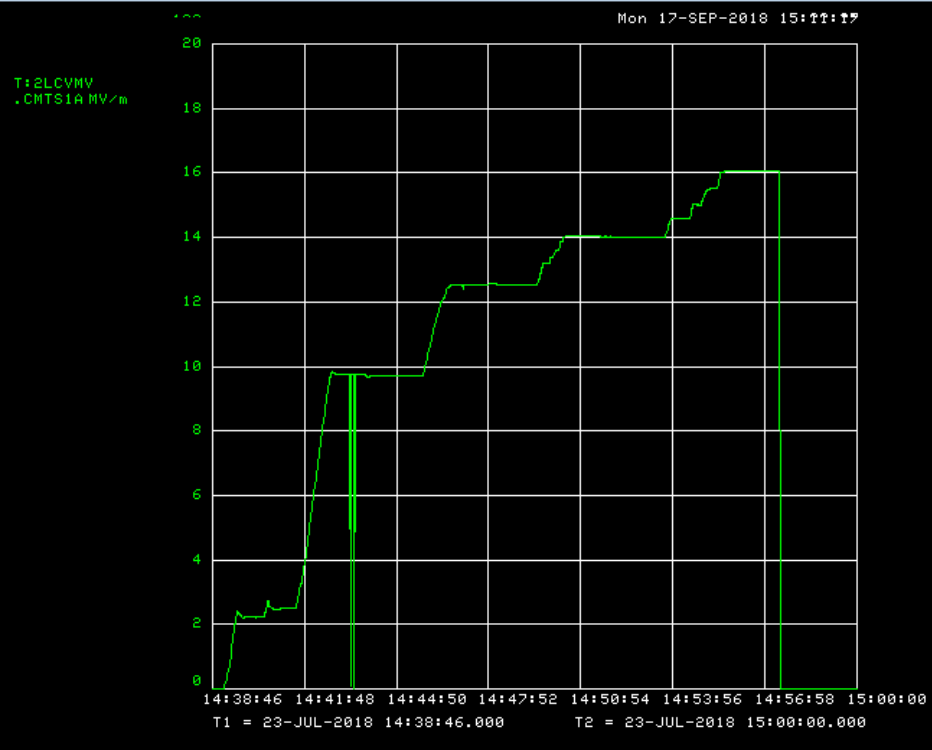


F1.3-10

Cavity 2

Mo-23-Jul-18

Tu-24-Jul-18

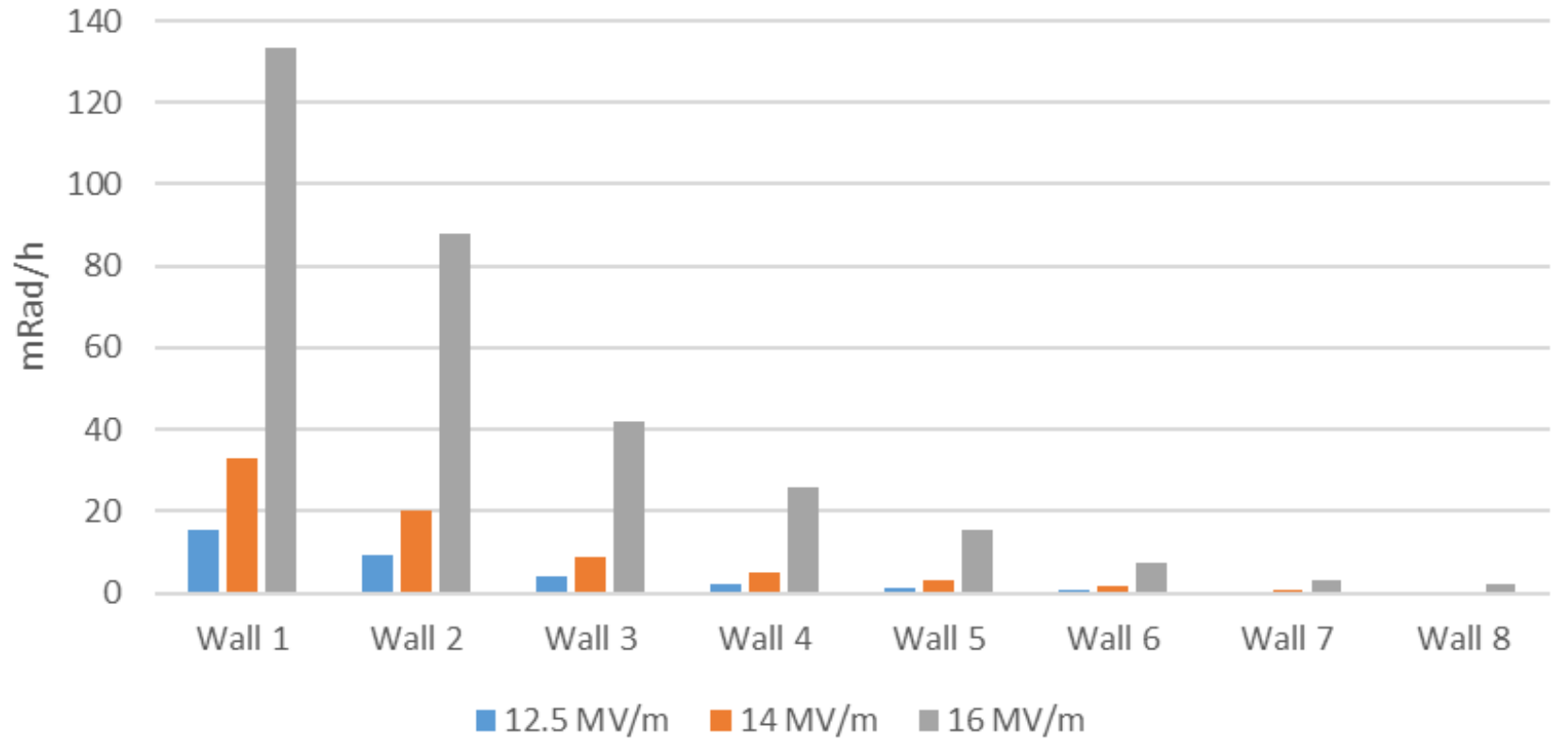


F1.3-10

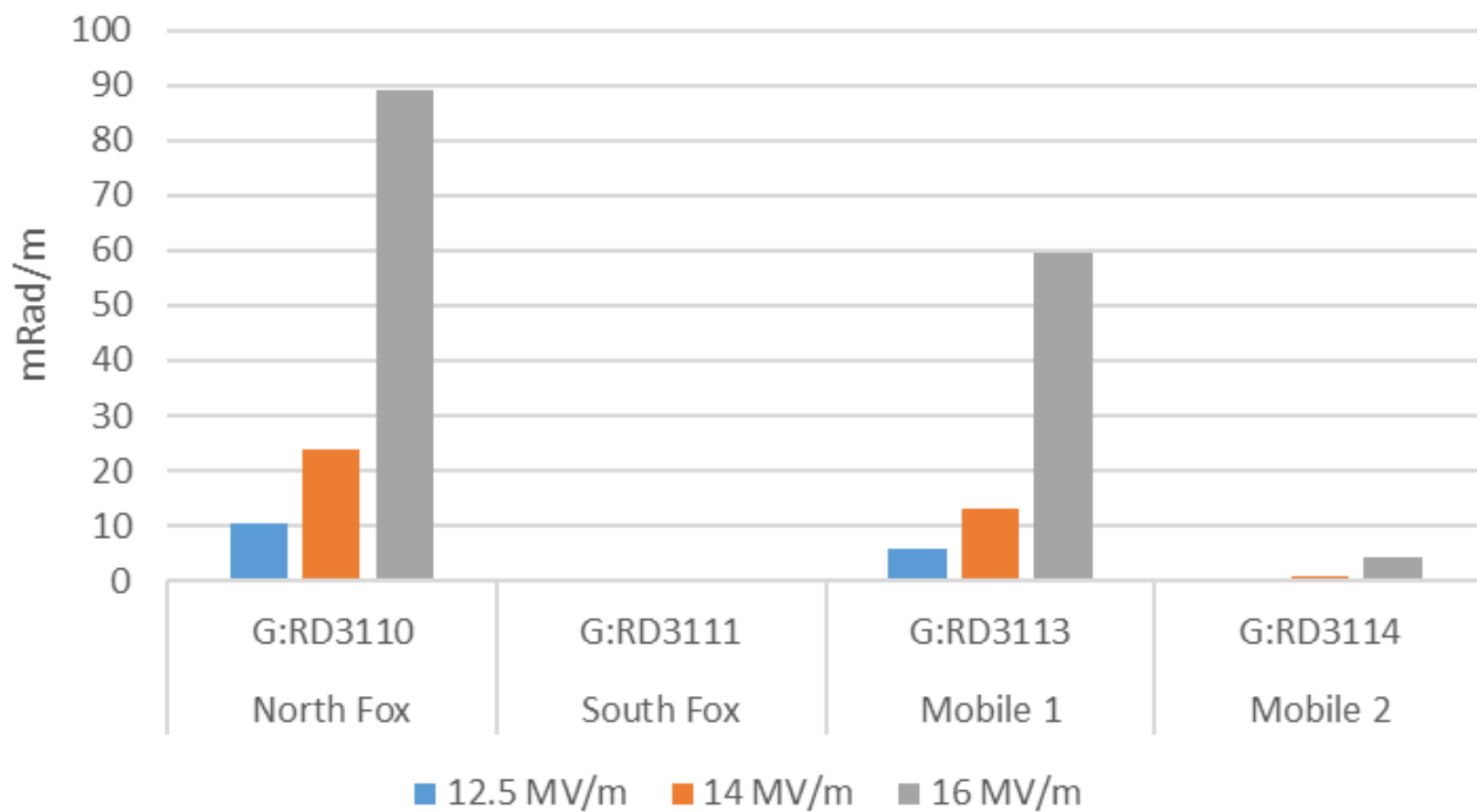
Cavity 2

Mo-23-Jul-18

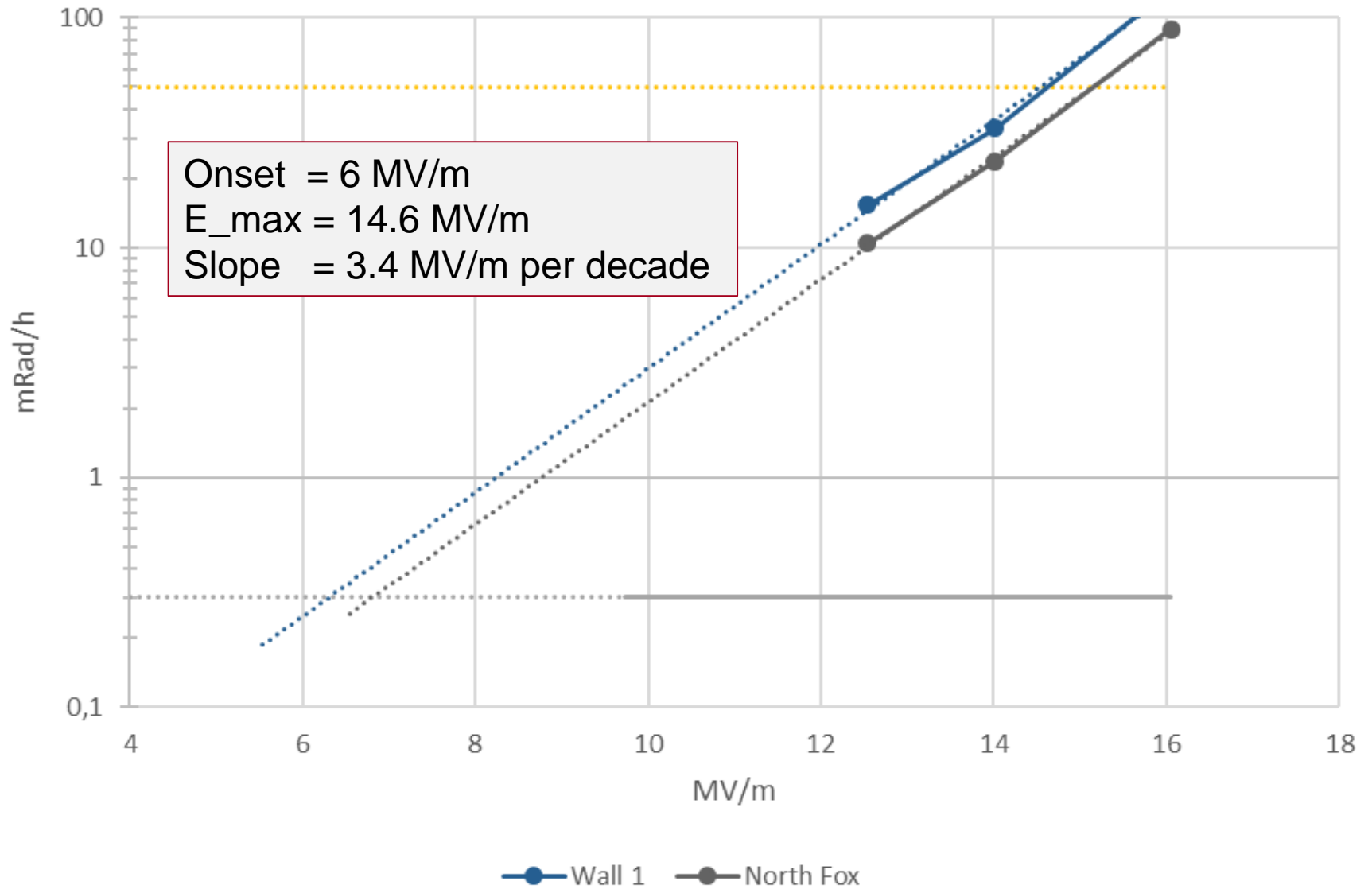
F1.3-10 Cavity 2 (CW)



F1.3-10 Cavity 2 (CW)



F1.3-10 Cavity 2 (CW)



F1.3-11 performance

Cavity	VTS			CMTF Test				Material
	Eacc* [MV/m]	FE onset	Q0@16MV/m	Max** Gradient [MV/m]	Usable Gradient*** [MV/m]	FE onset [MV/m]	Q0 @16MV/m 2K @ 80 g/s	
CAV0312	23.4	none	2.90E+10	21	21	none	3.17E+10	TD, 200/900
CAV0302	19.9	none	3.33E+10	20	17.5	none	3.22E+10	TD, 200/900
CAV0292	23.6	none	3.56E+10	20	18	none	3.71E+10	TD, 200/900
CAV0294	27	none	3.89E+10	21	19.5	none	3.77E+10	NX-B, 200/950
CAV0296	26.5	none	3.E+10	21	21	none	3.47E+10	NX-A, 200/950
CAV0136	32.1	none	3.57E+10	21	21	none	4.08E+10	NX-C, 200/975
CAV0267	24.9	24.8	3.13E+10	21	21	none	3.14E+10	NX-A, 200/950
CAV0311	18.6	none	4.10E+10	18.3	17.8	none	4.18E+10	NX-B, 200/950
Average	24.5		3.52E+10	20.5	19.6		3.59E+10	
Total Voltage	203.4			170.5	162.7			

*No VTS administrative limit

**21 MV/m is CMTF administrative limit

***50mR/h wall radiation detector and/or 0.5 MV/m below quench limit

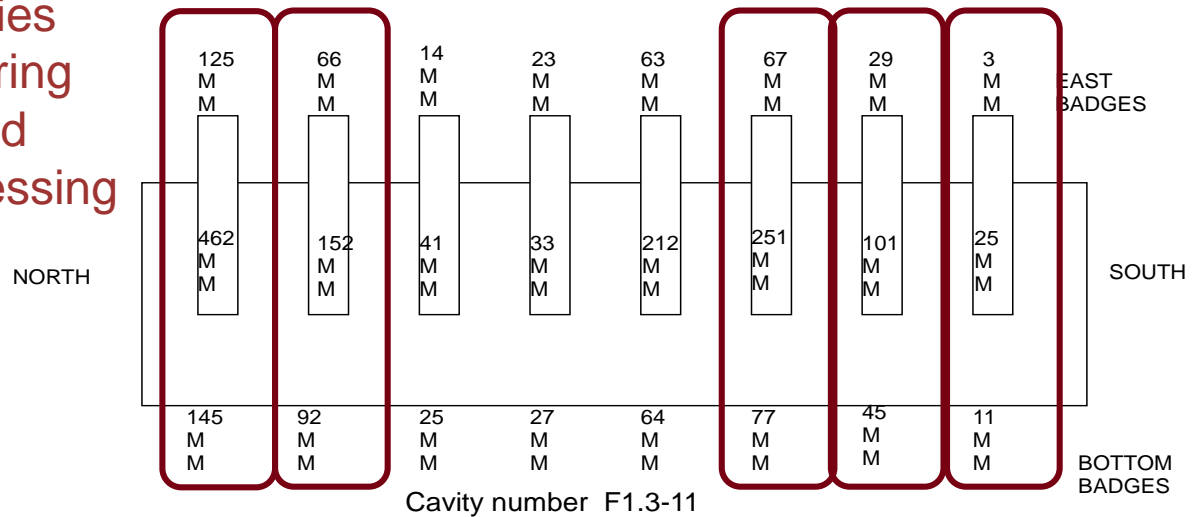
Q0 measurements started 77 hours after thermal bump

F1.3-11 addendum

- Dosimetry placed at 3 locations for each cavity
 - 24 dosimeters in total
 - Integrated dose correlated with cavities needing pulsed processing
 - Consistent with FE results

CMTS CAVITIES

Cavities requiring pulsed processing



Gamma
Thermal Neutrons
Fast Neutrons

F1.3-12 performance

Cavity	VTS			CMTF Test				Material
	Eacc* [MV/m]	FE onset	Q0@16MV/m	Max** Gradient [MV/m]	Usable Gradient*** [MV/m]	FE onset [MV/m]	Q0 @16MV/m 2K @ 32 g/s (preliminary)	
CAV0298	30	29	3.14E+10	20	19	none	2.62E+10	NX-B, 200/950
CAV0318	21.7	none	3.60E+10	19.5	19.5	none	2.83E+10	TD, 200/900
CAV0320	21.3	20.8	3.43E+10	21	21	none	3.53E+10	TD, 200/900
CAV0317	21	none	3.65E+10	20	19	none	3.07E+10	TD, 200/900
CAV0301	32	none	3.93E+10	21	21	none	3.27E+10	NX-A,B, 200/950
CAV0290	28.9	28.6	3.52E+10	21	21	none	3.06E+10	NX-A, 200/950
CAV0329	25.2	none	3.66E+10	21	20	none	3.40E+10	NX-A, 200/950
CAV0313	19.6	none	3.05E+10	21	17.5	none	2.80E+10	NX-A, 200/950
Average	24.9		3.49E+10	20.5	19.7		3.11E+10	
Total Voltage	207.2			170.7	164			

*No VTS administrative limit

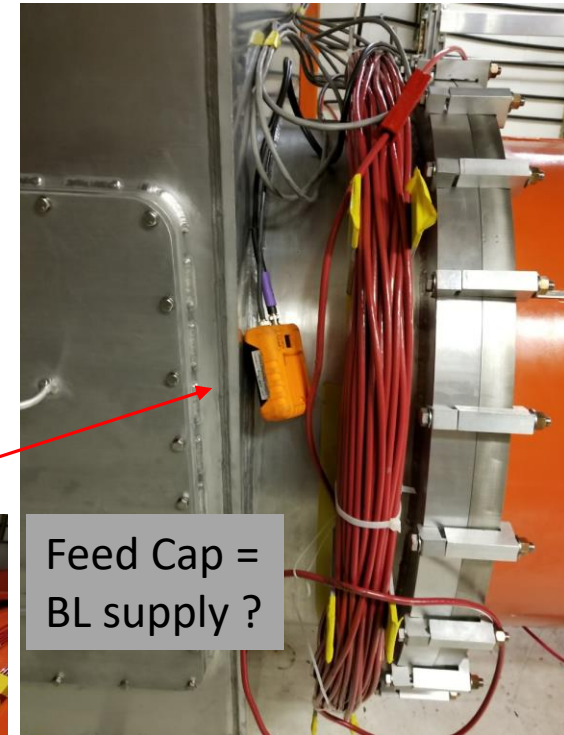
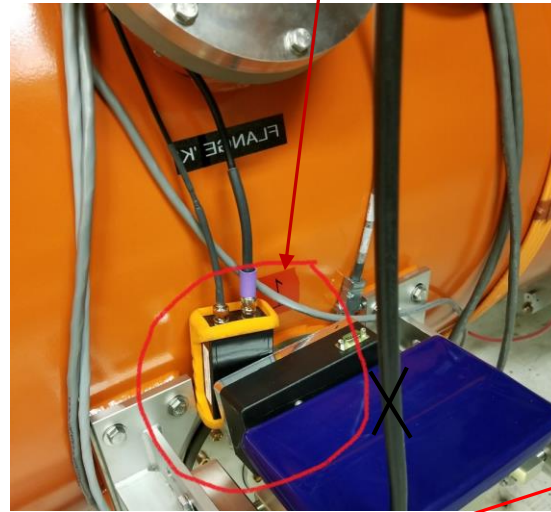
**21 MV/m is CMTF administrative limit

***50mR/h wall radiation detector and/or 0.5 MV/m below quench limit

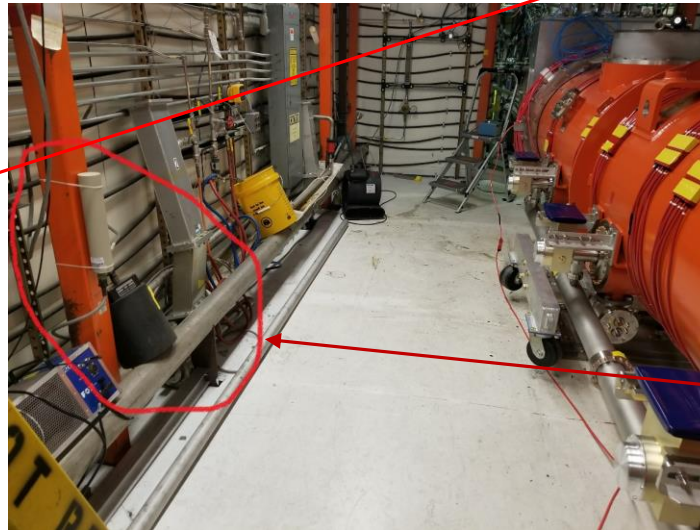
Q0 measurements started 26 hours after thermal bump

X-Ray monitor setup@JLab

8 GM-tubes detectors along module one-side, for measurement (in mrad/h)



2 GM-tubes detectors on
module ends, for
measurement (in mrad/h)



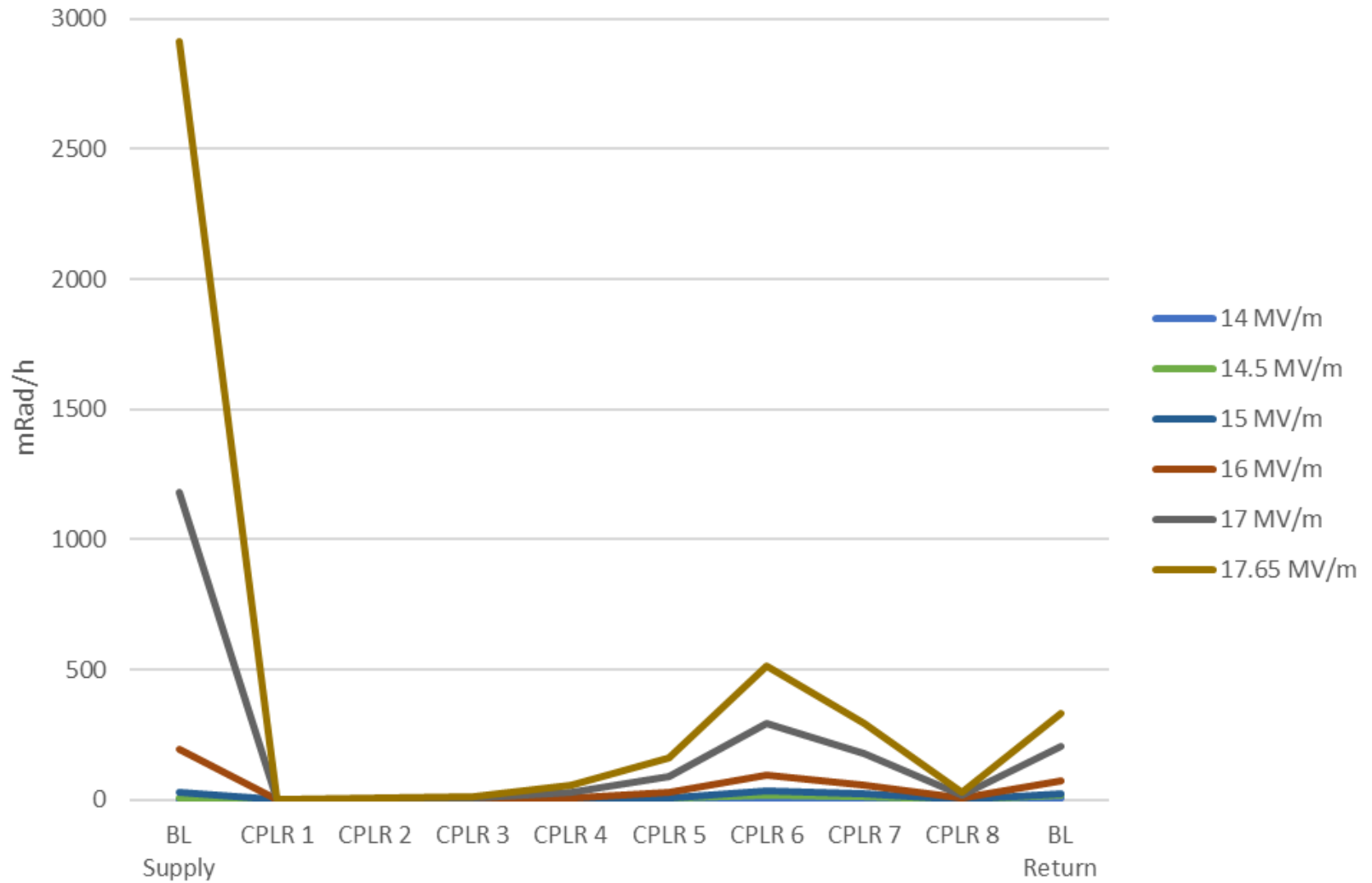
1 CARM detector for
neutrons and X-Rays
on the wall

J1.3-01

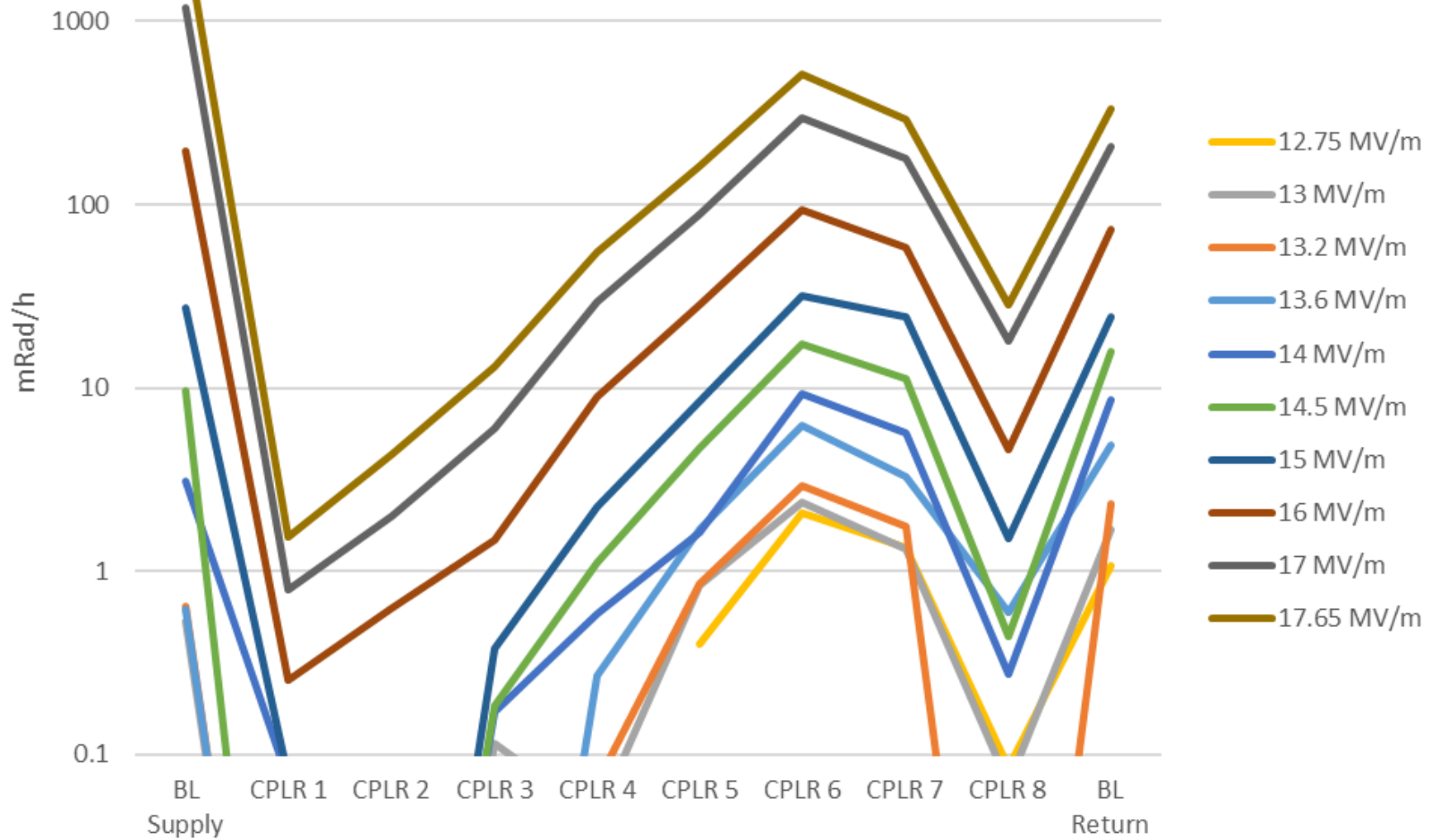
Cavity 6

20-Jan-17

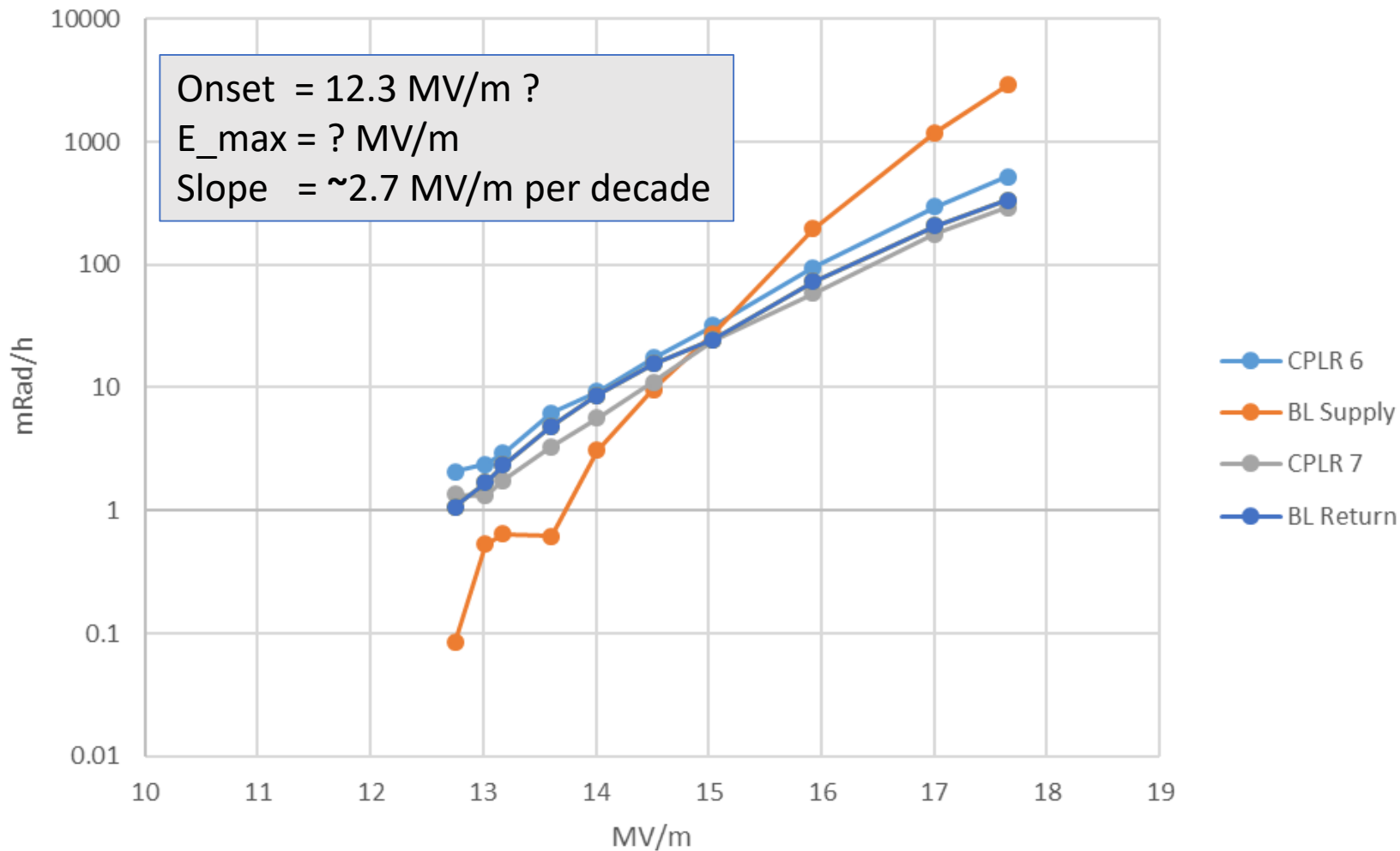
J1.3-01 Cavity 6 (CW)



J1.3-01 Cavity 6 (CW)



J1.3-01 Cavity 6 (CW)

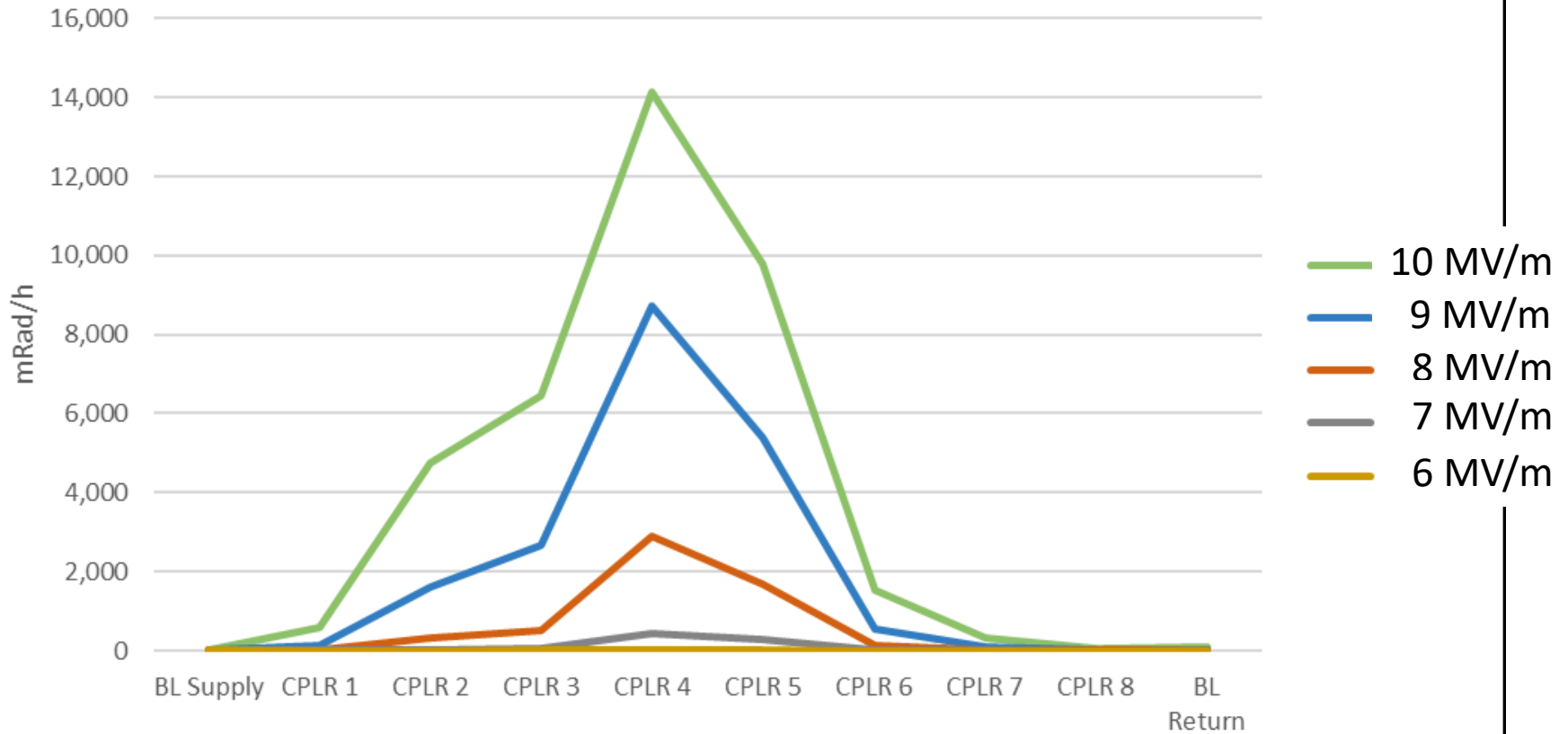


J1.3-02

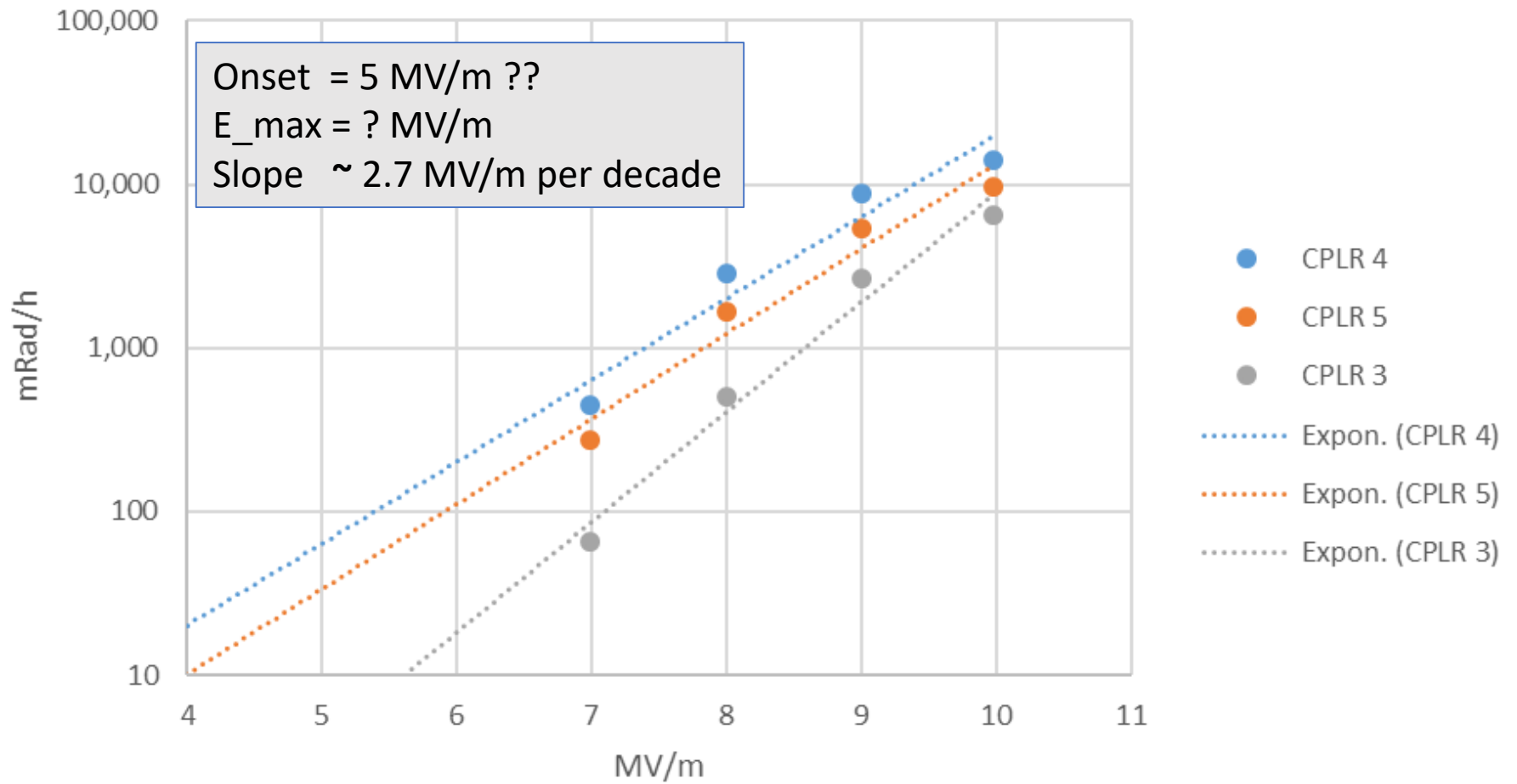
Cavity 4

31-July-17

J1.3-02 Cavity 4 (CW)



J1.3-02 Cavity 4 (CW)

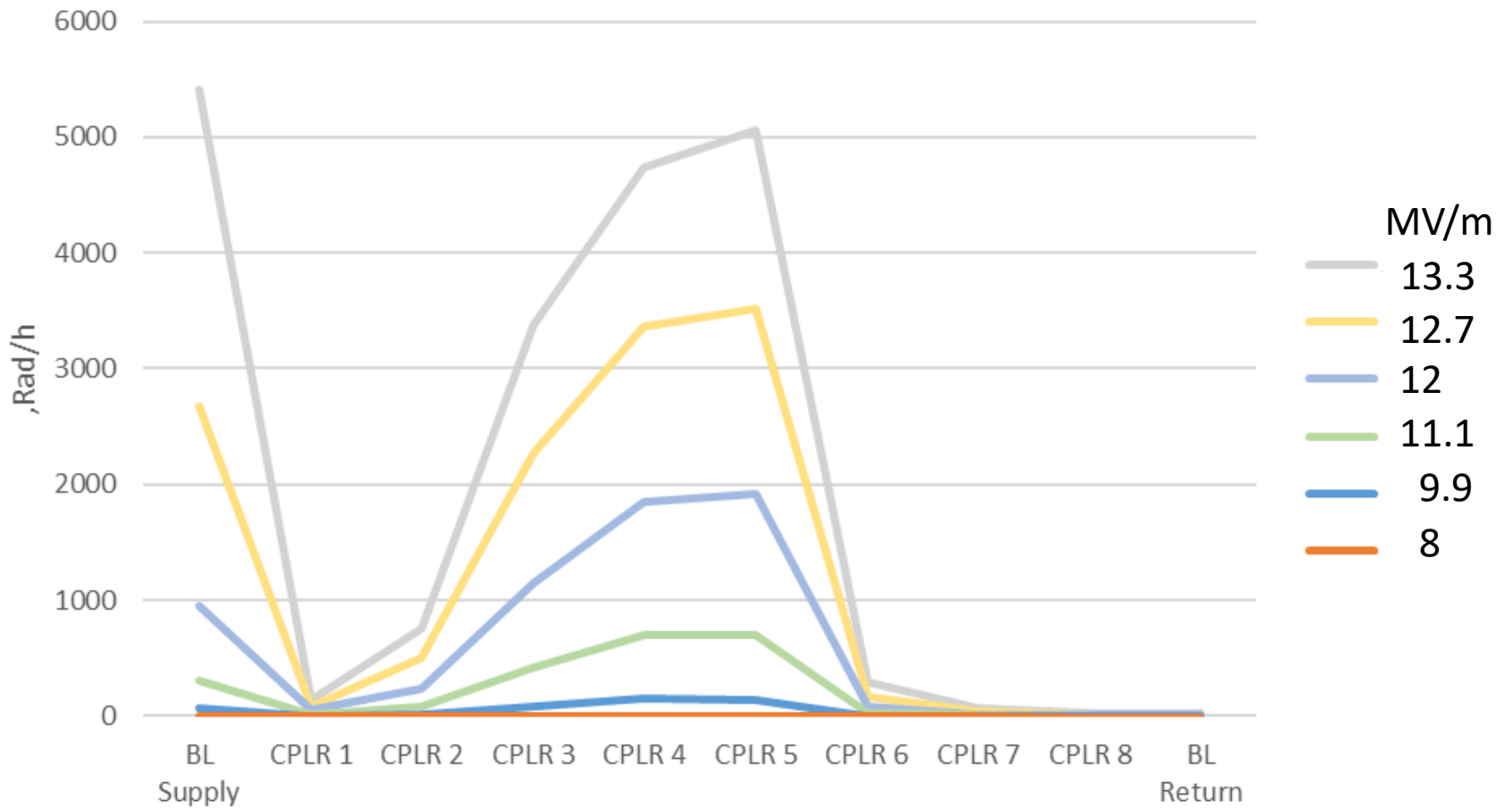


J1.3-03

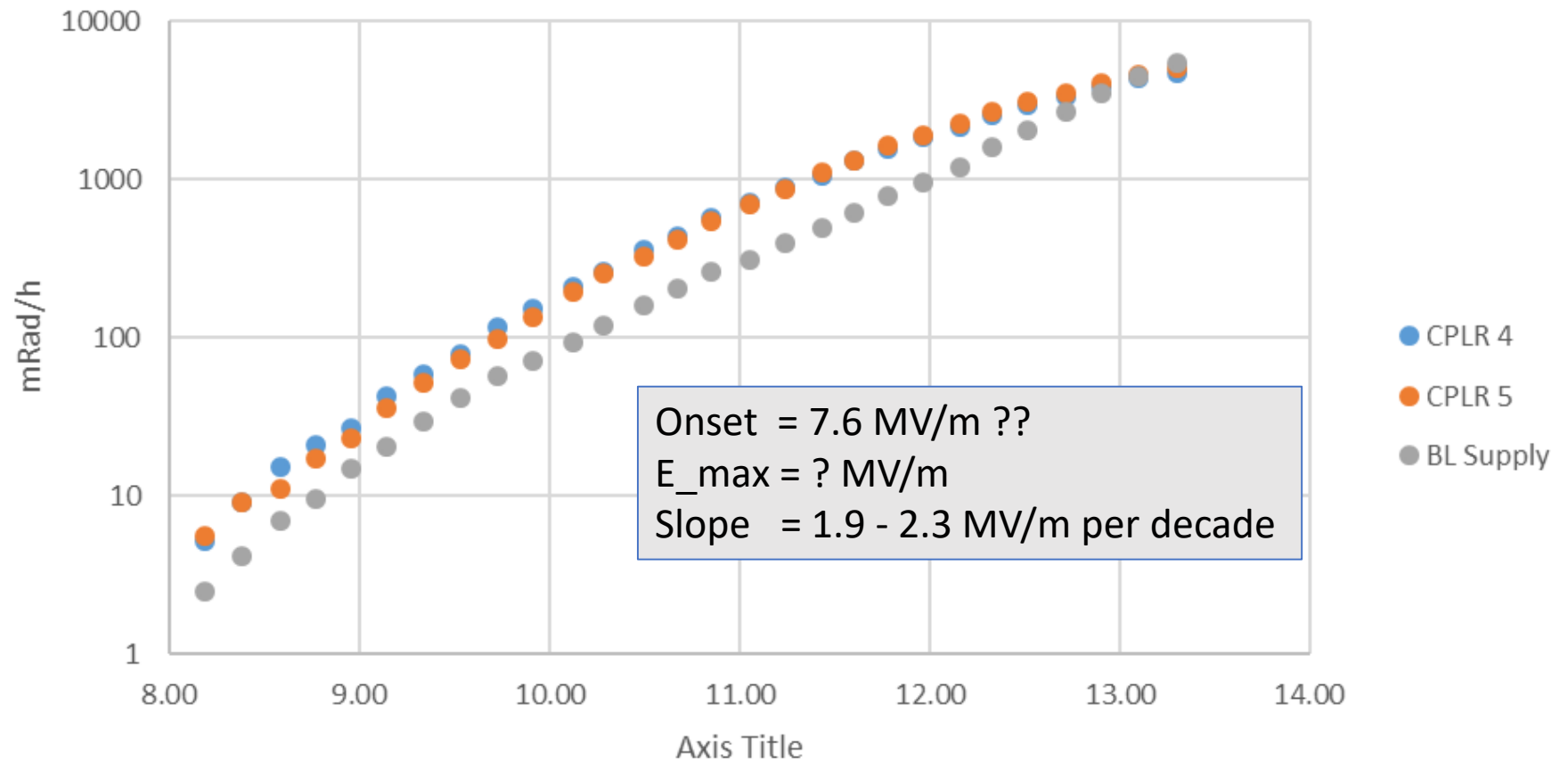
Cavity 5

14-Sept-17

J1.3-03 Cavity 5 (CW)



J1.3-03 Cavity 5 (CW)

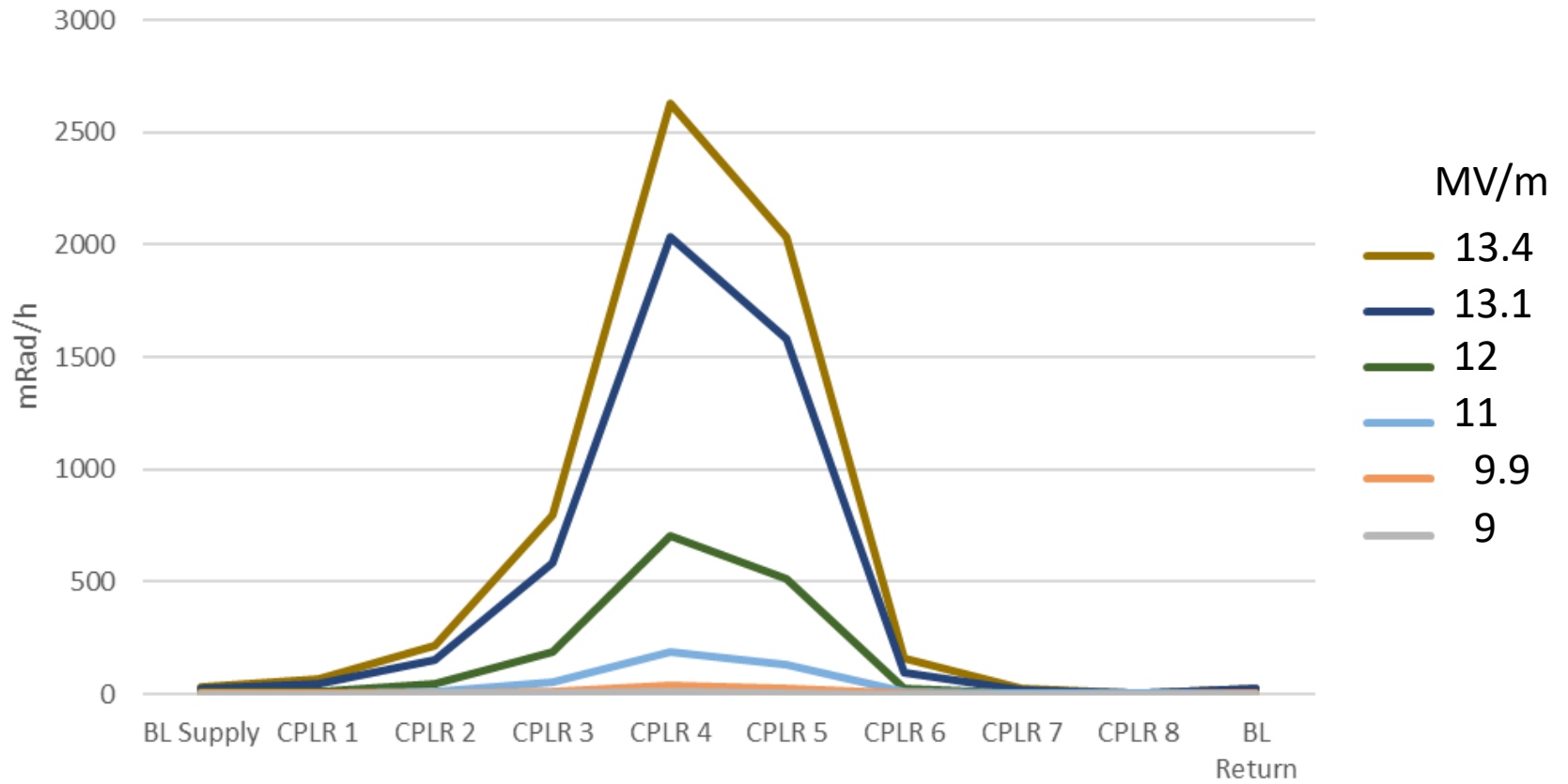


J1.3-03

Cavity 5

20-Oct-17

J1.3-03 Cavity 5 (CW)



J1.3-03 Cavity 5 (CW)

