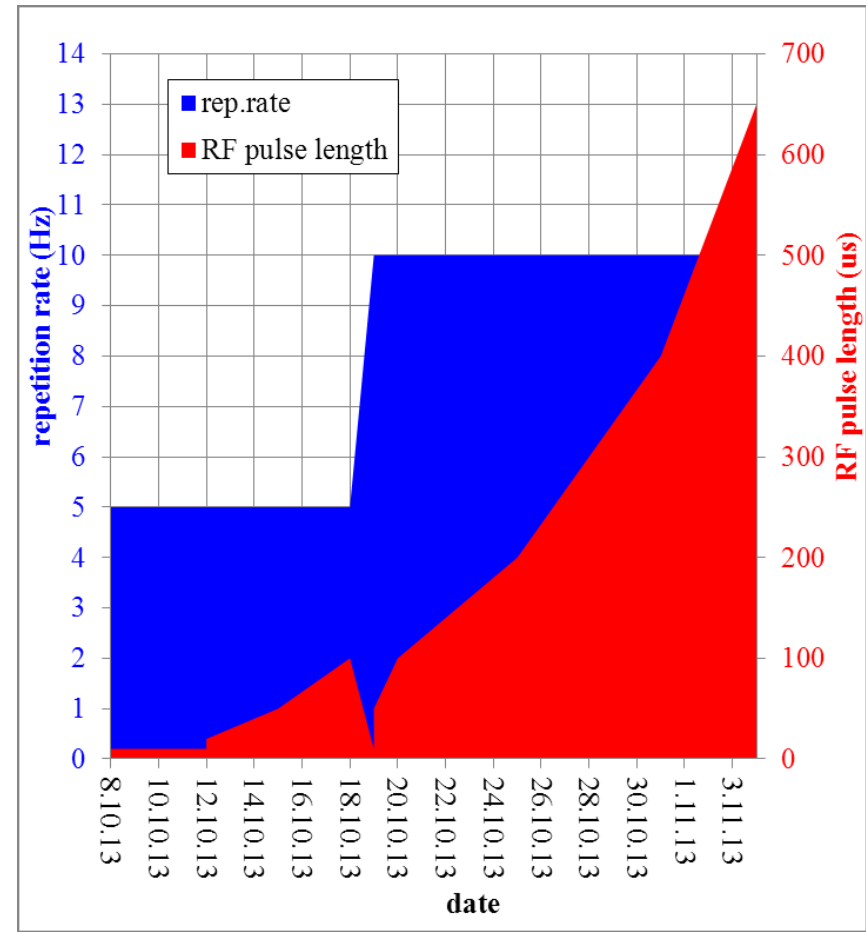


PITZ Run Coordination Meeting

07.11.2013

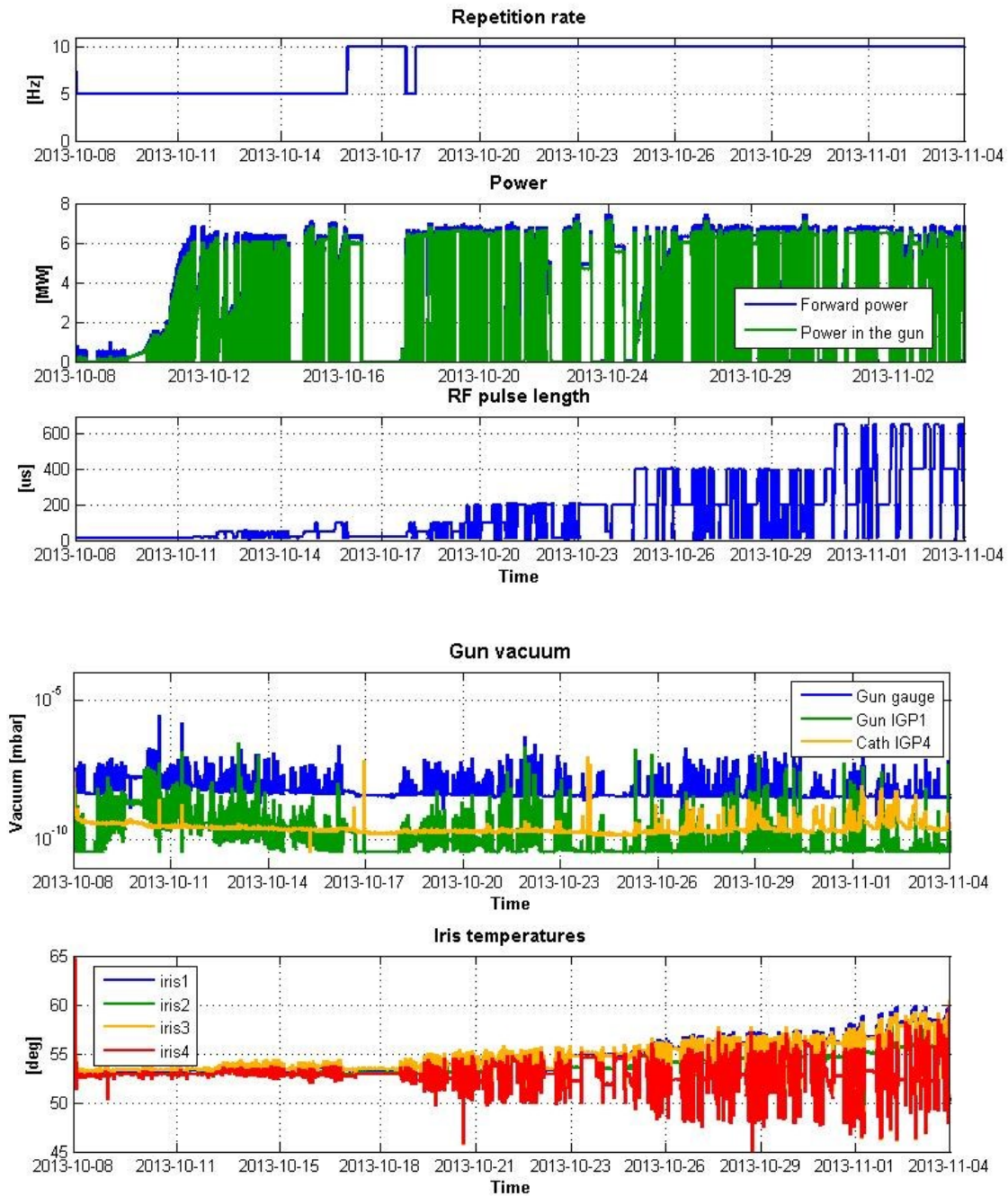
Gun-4.4: conditioning w/o solenoid

Conditioning Step		5	6	7	8	9	10
Rep.Rate (Hz)		10	10	10	10	10	10
RF pulse length (usec)		0/10/0	15/50/10	15/100/10	15/200/10	15/400/10	15/650/10
Max.peak power (MW)		6.5*(6.4)	6.5	6.5	6.5	6.5	6.5
Reached on		19.10.13M	19.10.13M	20.10.13M	25.10.13M	31.10.13M	4.11.13M
	date	SumOfTrips					
Gun trip on	20.10.13M	2		1	1		
	20.10.13A	5		2	3		
	20.10.13N	0					
	21.10.13M	3			3		
	21.10.13A	7		1	6		
	21.10.13N	1			1		
	22.10.13M	2			2		
	22.10.13A	9	1	1	7		
	22.10.13N	1			1		
	23.10.13M	3		1	2		
	23.10.13A	4		1	1	3	
	23.10.13N	0					
	24.10.13M	1	1				
	24.10.13A	0					
	24.10.13N	0					
	25.10.13M	1					
	25.10.13A	1					
	25.10.13N	1					
	26.10.13M	2			1	1	
	26.10.13A	1					1
	27.10.13M	5					1
	27.10.13A	4					10
	27.10.13N	1					0
	28.10.13M	2					2
	28.10.13A	3					2
	28.10.13N	2			2		
	29.10.13M	4					4
	29.10.13A	6			2		4
	29.10.13N	2			2		
	30.10.13M	6					4
	30.10.13A	4					4
	30.10.13N	1			1		
	31.10.13M	1			1	1	
	31.10.13A	0			0	1	0
	31.10.13N	1			1		
	01.11.13M	2				1	1
	01.11.13A	3				2	1
	01.11.13N	0					
	02.11.13M	2		1	1		1
	02.11.13A	1					1
	02.11.13N	0					
	03.11.13M	1					1
	03.11.13A	1					1
	03.11.13N	1					
	04.11.13M	1					1
	04.11.13N	0					

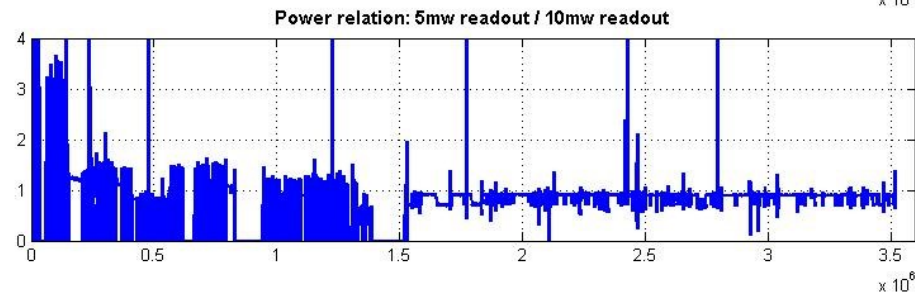
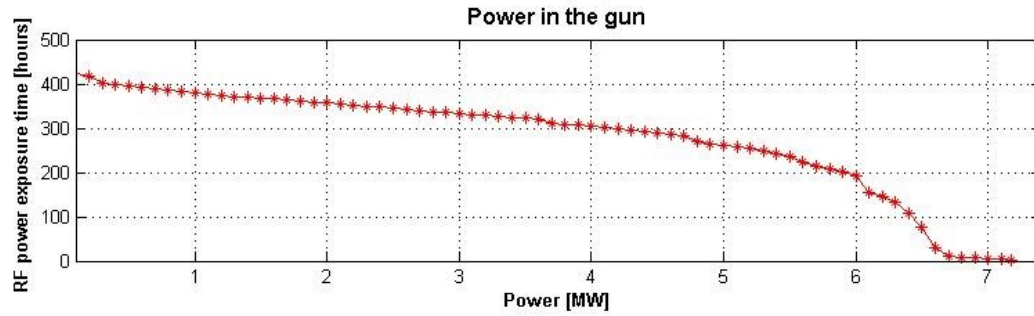
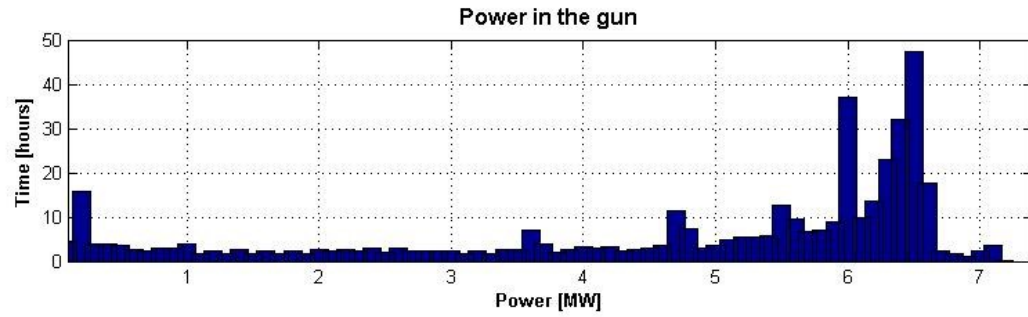


RR	PL	Power	Date
5	0/10/0	0	8.10.13A
5	0/10/0	6.5*(5.5)	11.10.13N
5	0/20/0	6.2	12.10.13A
5	15/50/10*	6.3	15.10.13M
5	15/100/10	6.3	18.10.13A
10	0/10/0	6.5*(6.4)	19.10.13M
10	15/50/10	6.5	19.10.13M
10	15/100/10	6.5	20.10.13M
10	15/200/10	6.5	25.10.13M
10	15/400/10	6.5	31.10.13M
10	15/650/10	5.65*	4.11.13M

Gun-4.4: conditioning w/o solenoid



Gun-4.4: conditioning w/o solenoid



Week 44-45: Problems and observations

- Gun resonance temperature drift
- Slight increase of the dark current
- Cathode (Mo, #636.1) damage

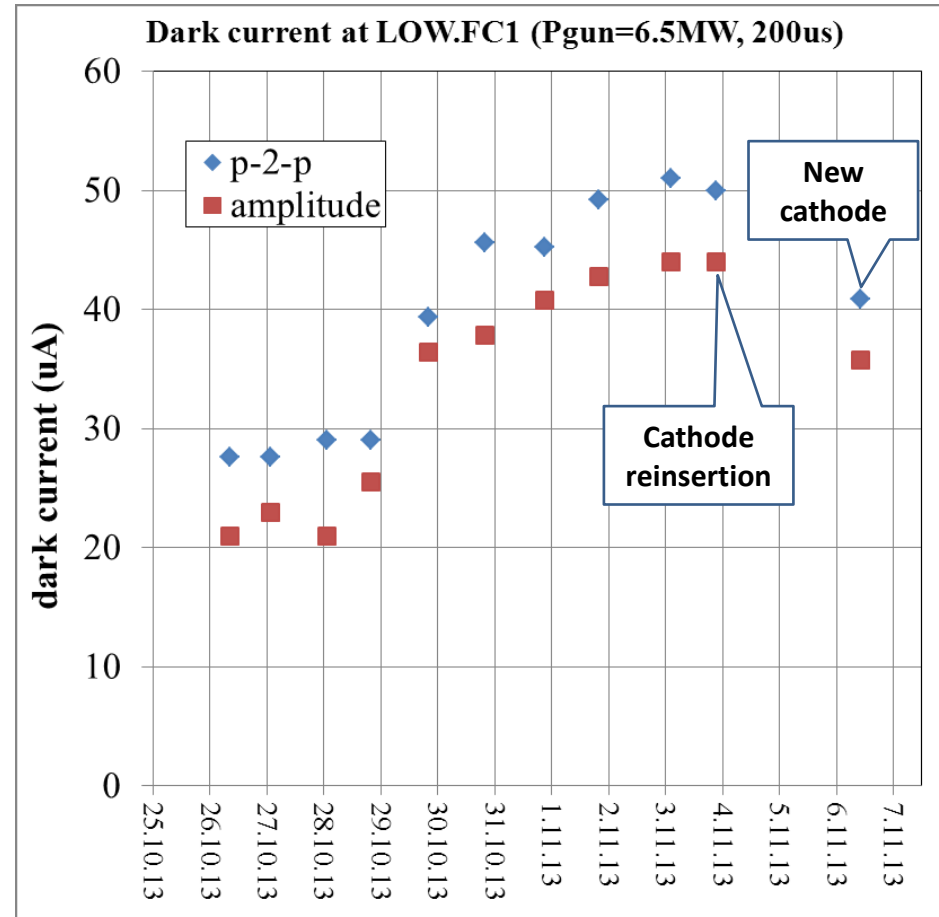
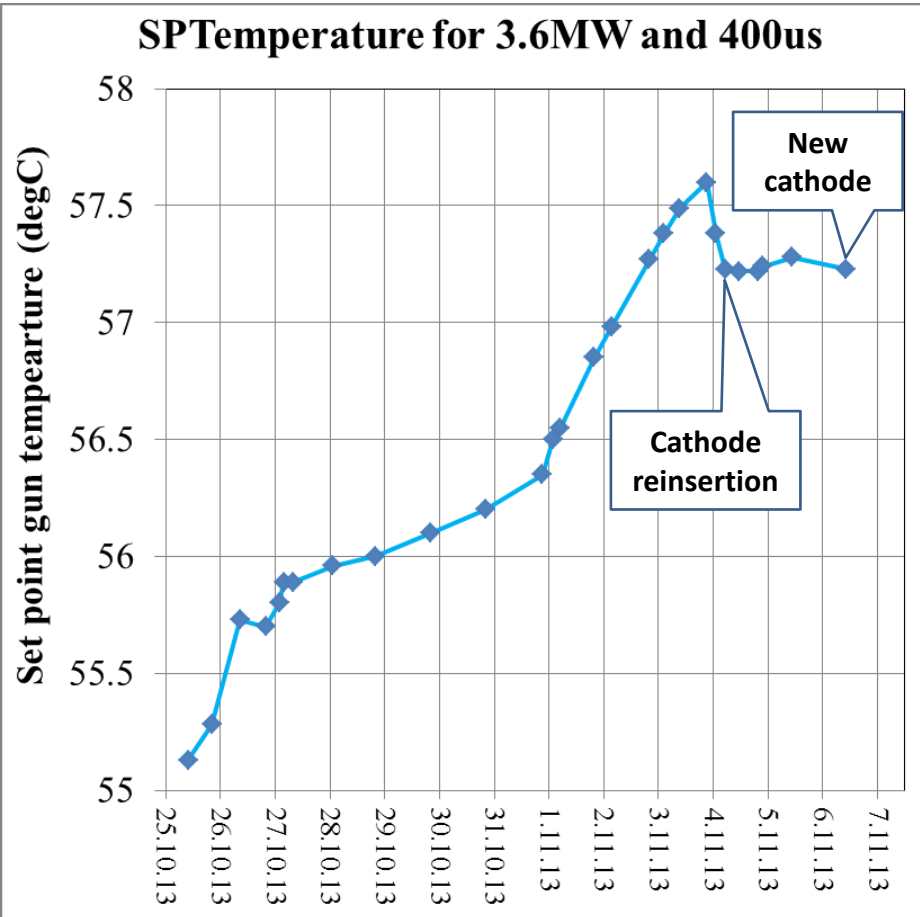
- Remaining(?):
 - RF measurements 5MW \leftrightarrow 10MW directional couplers
 - Spurious IIs?
 - Temperature gradient (>30degC) around the RF window

Gun resonance temperature drift

Benchmark for SPT monitoring: HV=9.3kV, SPPforw=23; 400us; reflection=4%

shift	time	date	SPT (degC)	HV pulse length [us]	Power in gun [MW]	Klystron power [MW]	Dark curent (uA) at 6.5MW		Remark
							p-2-p	amplitude	
25.10.2013A	21:55	10.25.13 21:55	55.13	850	3.6	-			
26.10.2013M	8:10	10.26.13 8:10	55.28	850	3.6	-			
26.10.2013A	20:40	10.26.13 20:40	55.73	850	3.6	-	27.6	21	
27.10.2013M	7:52	10.27.13 7:52	55.7	850	3.6	-			
27.10.2013M	13:44	10.27.13 13:44	55.8	850	3.6	-	27.6	23	
27.10.2013M	15:45	10.27.13 15:45	55.89	850	3.6	-			
27.10.2013M	20:00	10.27.13 20:00	55.89	850	3.6	-			
28.10.2013M	13:15	10.28.13 13:15	55.96	850	3.6	-	29	21	
29.10.2013M	8:00	10.29.13 8:00	56	850	3.6	-	29	25.5	
30.10.2013M	8:40	10.30.13 8:04	56.1	850	3.6	-	39.3	36.4	
31.10.2013M	8:40	10.31.13 8:04	56.2	850	3.6	4.9	45.6	37.8	
01.11.2013M	9:10	11.1.13 9:10	56.35	1150	3.6	4.5	45.2	40.8	
01.11.2013M	13:45	11.1.13 13:45	56.5	1150	3.6	4.5			
01.11.2013A	16:55	11.1.13 16:55	56.55	1150	3.6	4.5			
02.11.2013M	7:45	11.2.13 7:45	56.85	850	3.6	4.5	49.2	42.8	
02.11.2013A	15:22	02.11.2013 15:22	56.98	1150	3.6	4.5			
03.11.2013M	8:00	03.11.2013 08:00	57.27	850	3.6	4.4			
03.11.2013M	14:15	03.11.2013 14:15	57.38	850	3.6	4.5	51	44	
03.11.2013A	21:37	03.11.2013 21:17	57.49	1150	3.65	4.5			
04.11.2013M	9:12	04.11.2013 09:12	57.6	1150	3.6	4.4	50	44	
04.11.2013M	13:00	04.11.2013 13:00	57.38	1150	3.65	4.4			
04.11.2013A	17:10	04.11.2013 17:10	57.23	1150	3.65	4.4			Cath.#636.1 reinserted
04.11.2013A	23:20	04.11.2013 23:20	57.22	950	3.65	4.4			
05.11.2013M	07:36	05.11.2013 07:36	57.22	950	3.66	4.4			
05.11.2013M	9:42	05.11.2013 09:42	57.24	950	3.65	4.4			
05.11.2013L	22:40	05.11.2013 22:40	57.28	950	3.65	4.25			
06.11.2013L	22:00	06.11.2013 22:00	57.23	950	3.7	4.5	40.9	35.7	Cath. exchanged to #638.1

Gun resonance temperature and dark current



Cathode #636.1 (Mo) visual inspection



- Extracted cathode (636.1) was in upright (azimuthally) position
- There are a lot of marks on the side surfaces
- No damages/spots observed at the front surface



Visual inspection of all cathodes (6.11.2013)

Mo, #637.1



Mo, #638.1



Mo, #639.1



Now inserted in the gun



Week 45: conditioning with solenoid

Imain\Prf->	0.1	0.2	0.25	0.3	0.45	0.75	1	1.25	1.5	1.75	2	2.25	2.5
500				V									
490				V									
480				V									
470				V									
460				V									
450				V									
440				V									
430				V									
420				V									
410				V									
400				V									
390				V									
380				V									
370				V									
360				V									
350				V									
340				V									
330				V									
320				V									
310				V									
300				V									
290				V									
280				V									
270				V									
260				V									
250				V									
240				V									
230				V									
220				V									
210				V									
200				V									
190				V									
186				V									
180				V									
170				V									
160				V									
150				V									
140				V									
130				V									
120				V									
110				V									
100				V									
90				V									
80				V									
70				V									
60				V									
50				V									
40				V									
30				V	V	V	V	V	V	V	V	V	V
20				V									
10				V									
0				V									

Vacuum spikes from time to time still present



- Passed or conditioned region
- Passed region still showing some vacuum activity
- Passed region still presenting some e-det interlocks
- Assumed to be fine
- Problematic region
- ED Electron detector interlocks
- V Vacuum activity
- Goal

Measurement program: Gun-4.4

priority	program item	num.of shifts	coordinator	preferred dates	Remarks
0.9	Dark current measurements	1-2	M.Krasilnikov		200us, 2D scan(RF power, I _{main})
1	Laser alignment (rough)	2-4	M.Gross	12.11.2013	
1.1	Solenoid BBA	4	M.Krasilnikov	after 12.11	
1.2	Long momentum measurements	2	M. Otevrel		more details?
1.2	Kapton foil tests with e-beam	1	M.Gross	weeks 48 or 50	solenoid scan+booster
1.2	Booster steering studies	7	M.Otevrel, D.Kalantaryan	after 12.11	?combined with Cathode-1?
1.4	BPMs commissioning	3	M.Krasilnikov, F.Tonisch		+booster
1.6	Emittance-1nC	17	G.Vashchenko, M.Krasilnikov		Flatlop laser temporal profile
1.61	Emittance-250pC	10	G.Vashchenko, M.Krasilnikov		Flatlop laser temporal profile
1.62	Emittance-100pC	20	G.Vashchenko, M.Krasilnikov		Flatlop laser temporal profile
1.63	Emittance-20pC	21	G.Vashchenko, M.Krasilnikov		Flatlop laser temporal profile
1.7	Tomo-1	14	G.Kourkafas		
2.41	Tomo-2 (matching studies)	14	G.Kourkafas		
2.5	Cathodes-1 (life time)	21	S.Lederer		21 shift/cathode!->63?; 6500nC/sec!
2.5	Gun phase stability	9	I.Isaev		to be combined with Cathodes-1?
2.6	Cathodes-2 (emittance, QE, QE-map)	6	S.Lederer,...		2 cathodes
2.8	Emission studies	6	M.Krasilnikov		laser temporal profile to be changed
2.9	Low charge bunches characterization	9	B.Marchetti, D.Malyutin		Laser=5.4ps FWHM
2.91	Gauss-20pC	12	M.Rehders		laser temporal profile to be changed
2.95	Thermal emittance	??	M.Otevrel		
3	Bunch length with DCM1	3	D.Lipka		
3	XFEL Toroid	1	R.Neumann (N.Baboi), F.Tonisch	2013/KW50, 2014/KW3,6,8; Mo-Do	to be combined with Cathodes-1?
3.5	?Booster dark current studies?	??			1week for higher peak power