

PITZ Run Coordination Meeting

23.01.2014

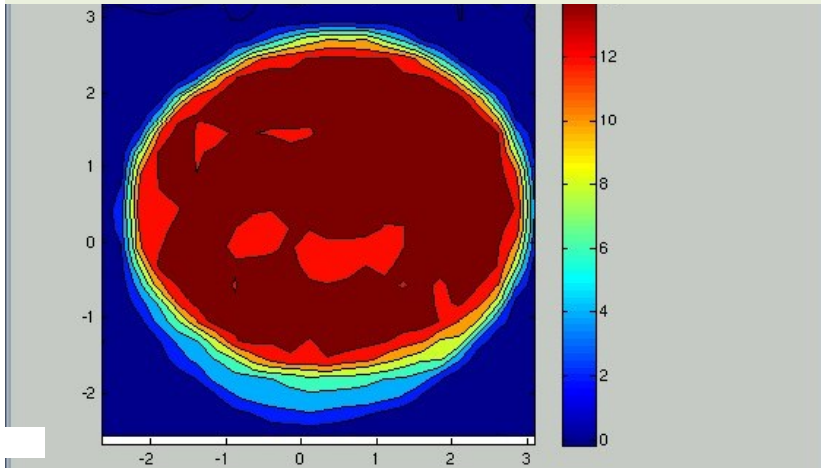
Week 4: Plans

1. Conditioning
 - A. HV=9.7kV → max peak power at 100/200/400/650?us → with new Mo cathode (633.1)
 - B. Another approach: conditioning with 800us pulses
 - C. Reach the milestone : 24h=6.5/650/390 → ?
 - D. Monitor resonance temperature (Excel file: ResTemp400usMonitoring.xlsx)
 - E. Monitor dark current: 6.5MW, 200us, LOW.FC1 (same Excel file) → + solenoid scan
2. Photoelectrons:
 - A. QE and QE-map measurements
 - B. Solenoid BBA → check may be if time (MK)
3. Measurement program
 - 1.2 Long momentum measurements → with precise MMMG phase w.r.t 0
 - 1.2 Kapton foil tests with e-beam → to be repeated
 - 1.2 Booster steering
 - 1.4 BPM commissioning → ok
 - 2.5 Phase stability measurements (+new WCS tests) → ok
 - 1.6 Emittance 1nC or 100pC

Week 4	Mon Jan-20	Tue Jan-21	Wed Jan-22	Thu Jan-23	Fri Jan-24	Sat Jan-25	Sun Jan-26
Morn. 7:00 to 15:30	Otevrel QE	QE-map Malyutin	Kapton 100pC Prach B.	Otevrel Prach B.	Otevrel Khojoyan	Otevrel Khojoyan	Otevrel Khojoyan
Late 15:00 to 23:30	Vashchenko Emit 100pC	Emit 100pC	Vashchenko Good	Vashchenko Good	Vashchenko Good	Vashchenko Good	Vashchenko Good
Night 23:00 to 7:30	Kourkafas Kalantaryan	Tomo 100pC Kalantaryan	Kourkafas Marchetti	Kourkafas Marchetti	Kourkafas Marchetti	Kourkafas Marchetti	Kourkafas Marchetti

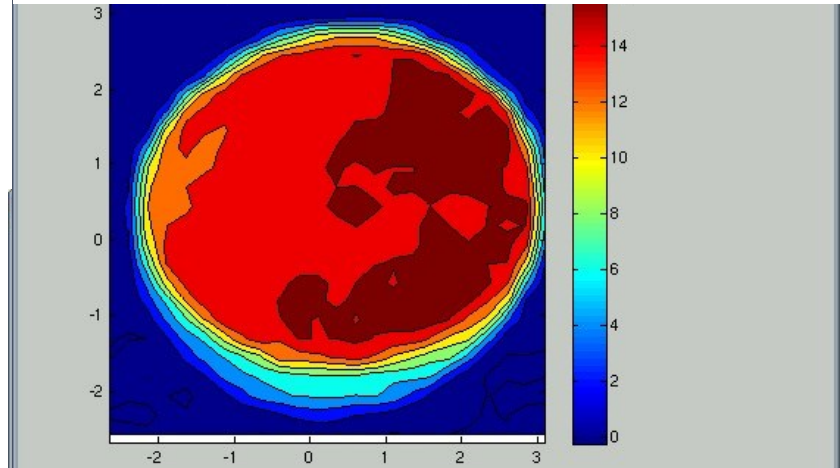
QE-maps

[10.01.2014](#) 06:15 QE map of Cs2Te cathode #640.1 (~1.4MW in the gun)



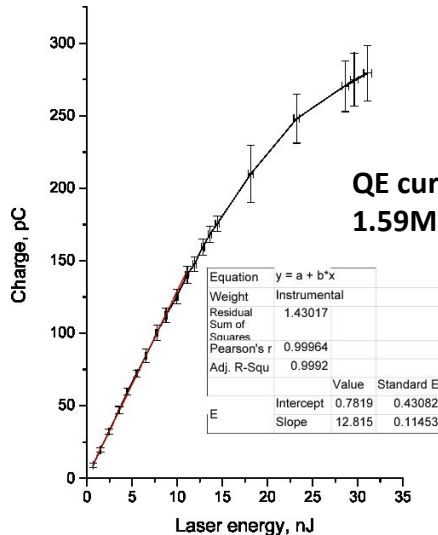
QE measurements at 1.5MW in gun, BSA=2mm (650us) → Estimated QE=6.8%

[10.01.2014](#) 09:03 QE map of Cs2Te cathode #640.1 (~6.0MW in the gun)



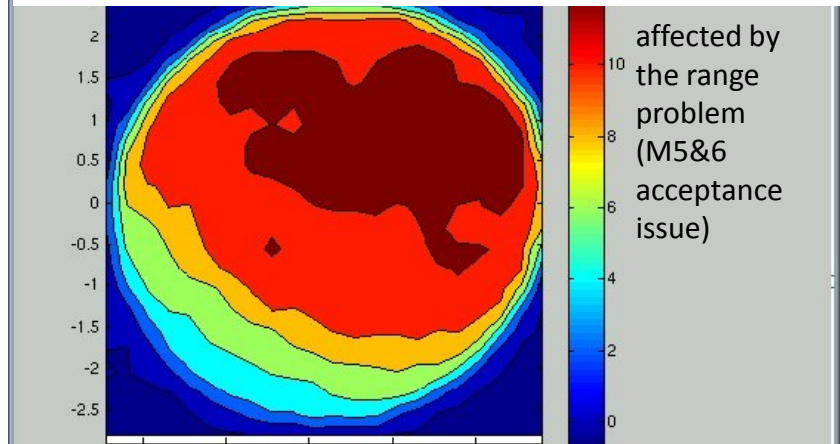
QE measurements at 6.0MW in gun, BSA=2mm (650us) → Estimated QE=6.8%

[20.01.2014](#) 16:29 QE-measurements



QE curve, BSA=2.16mm, 1.59MW 650us. QE = 6.2 %

[21.01.2014](#) 16:05 QE map of Cs2Te cathode #640.1 (~6.0MW in the gun)



QE measurements at 6.0MW in gun → Estimated QE=6.4%

Week 4: Problems

- Laser pulse energy decrease
- Booster WCS is out of order
- Still unstable run at 650us

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Late 15:00 to 23:30	Vashchenko Prach B.	Vashchenko Good	Vashchenko Good	Vashchenko Good	Vashchenko Good	Vashchenko Good	Vashchenko Good
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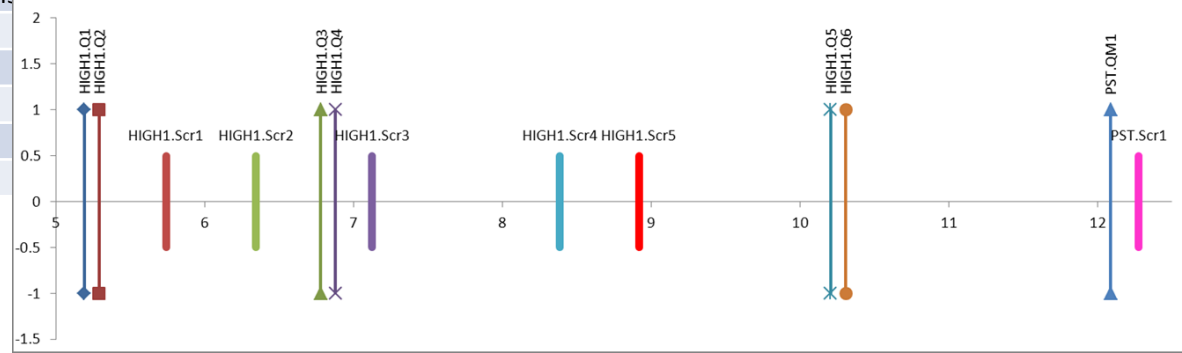
Weeks 4: Kapton foil tests (proposals)

Setup

- Gun 200 (650) us, 6.5 (6) MW, MMMG phase
- Laser temporal – available profile (17ps FWHM?)
- Transverse: smallest BSA for Q=100pC at LT=80%
- Booster 3MW (final Pz=22MeV/c)
- Transport – centered at screens up to Tomo.Scr1
- Solenoid and Quads → to be tuned – see the measurement table for focusing

- For images at PST.S1 with kapton inserted use 2 pulses and 30 pulses (2 files)
- Additional measurement with kapton – try to focus the scattered beam with H1.Q5, H1.Q6, PST.QM1
- 10 frames+bkg for an image
- Keep the same gain for the same camera within the same measurement

meas#	Imain	H1.Q1	H1.Q2	H1.Q3	H1.Q4	H1.Q5	H1.Q6	PST.QM 1	conditions
M1	I1	0	0	0	0	0	0	0	focus at H1.S5
M2	I2	0	0	0	0	0	0	0	focus at PST.S1
M3	I3=0.5*(I1+I2)	0	0	0	0	0	0	0	focus between
M4	I1	Q1M4	Q2M4	0	0	0	0	0	focussed round beam at H1.S5
M5	I1	Q1M5	Q2M5	0	0	0	0	0	focussed round beam at PST.S1
M6	I1	Q1M6	Q2M6	0	0	0	0	0	round equal beams at H1.S5 and PST.S1
M7	I2	Q1M7	Q2M7	0	0	0	0	0	focussed round beam at H1.S5
M8	I2	Q1M8	Q2M8	0	0	0	0	0	focussed round beam at PST.S1
M9	I2	Q1M9	Q2M9	0	0	0	0	0	round equal beams at H1.S5 and PST.S1
M10	I3	Q1M10	Q2M10	0	0	0	0	0	focussed round beam at H1.S5
M11	I3	Q1M11	Q2M11	0	0	0	0	0	focussed round beam at PST.S1
M12	I3	Q1M12	Q2M12	0	0	0	0	0	round equal beams at H1.S5 and PST.S1
M13	I3	Q1M12	Q2M12	Q3M13	Q4M13	0	0	0	focussed round beam at H1.S5
M14	I3	Q1M12	Q2M12	Q3M14	Q4M14	0	0	0	focussed round beam at PST.S1
M15	I3	Q1M12	Q2M12	Q3M15	Q4M15	0	0	0	round equal beams at H1.S5 and PST.S1



Measurement program: Gun-4.4

priority	program item	num.of shifts	coordinator	prefered dates	Remarks
0.9	Dark current measurements	1-2	M.Krasilnikov		200us, 2D scan(RF power, Imain)
1	Laser alignment (rough)	2-4	M.Gross	12.11.2013	done
1.1	Solenoid BBA	4	M.Krasilnikov	after 12.11	in progress
1.2	Long momentum measurements	2	M. Otevreil		more details?
1.2	QE and QE-map measurements	2	M. Otevreil, M. Gross		
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.Otevreil, 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		Flattop laser temporal profile
1.61	Emittance-250pC	10	G.Vashchenko, M.Krasilnikov		Flattop laser temporal profile
1.62	Emittance-100pC	20	G.Vashchenko, M.Krasilnikov		Flattop laser temporal profile
1.63	Emittance-20pC	21	G.Vashchenko, M.Krasilnikov		Flattop 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
2.85	Bunch length by 3-phase method	??	T.Vinatier		LPS (D.Malyutin?) + D.Lipka (DCM1)?
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.Otevreil		
3	Bunch length with DCM1	3	D.Lipka	not KW7/2014	cross-check with LPS Tomo (DM)
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