

Run coordination meeting.

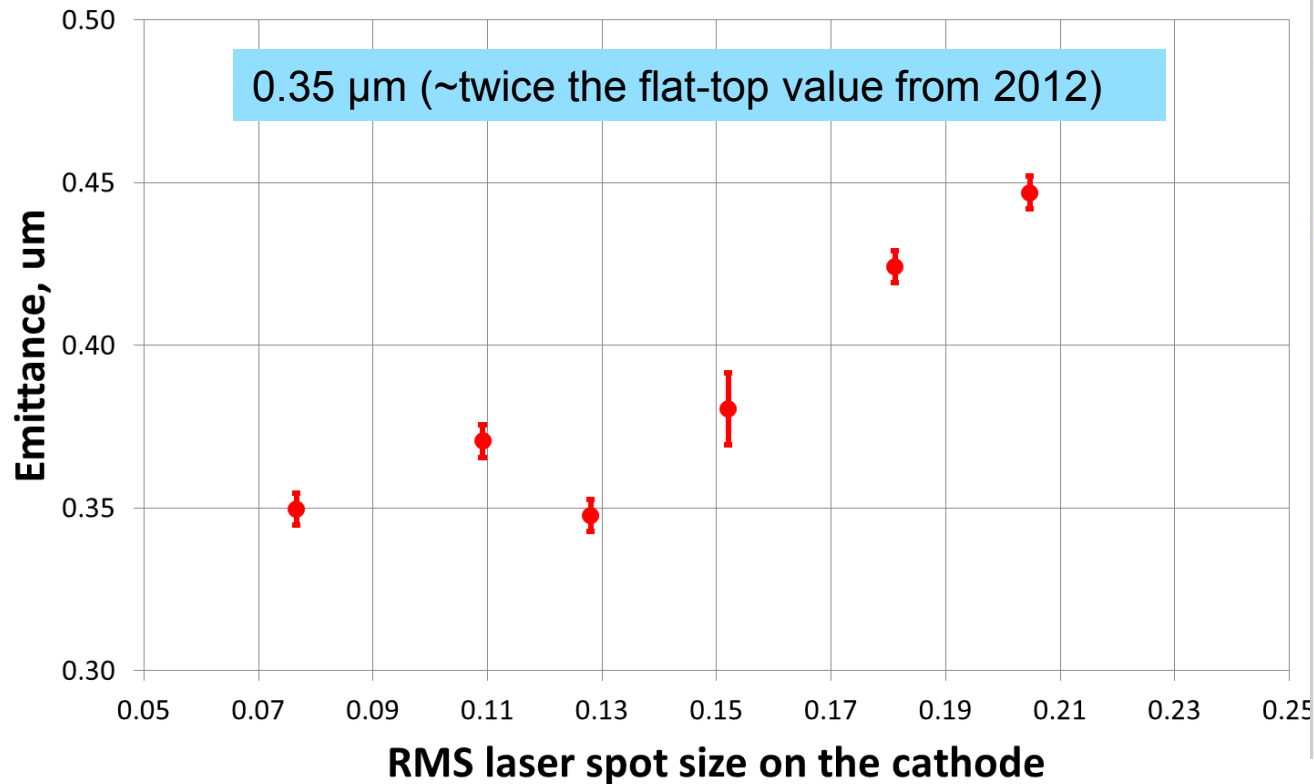
Holger Huck
25.06.2015

- Emittance measurements for 20 pC
- Several BBO crystal alignments
- New LEDA capacitor
- Cathode exchanged
 - old one is damaged
 - with new one:
 - much higher emittance
 - tilted double peak structure
 - 3 nC extracted

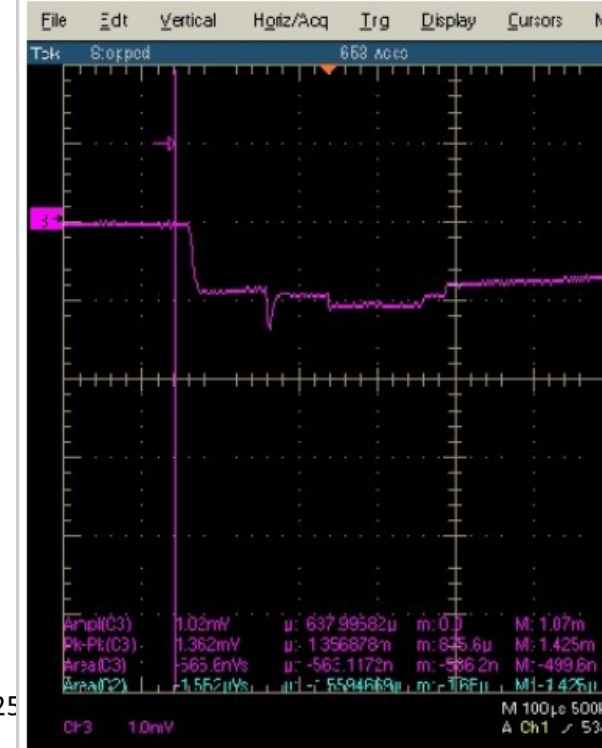
- HEDA2 beam transport
- Several gun trips and also Thales window interlocks
- Investigation of booster dark current & radiation desirable?

20 pC emittance measurements

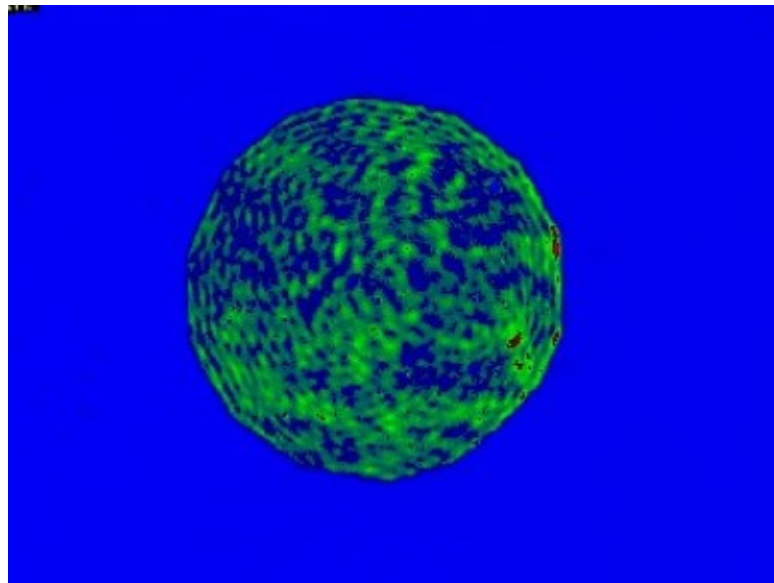
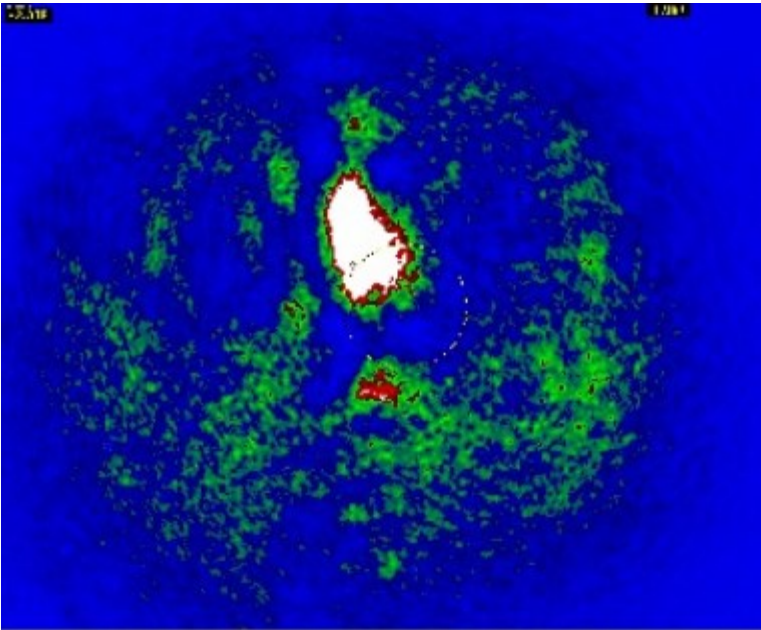
- Minimum BSA 0.3 mm (QE & laser power)
- Maximum BSA ~ 0.8 mm...
 - Booster acceleration limited to 120 pulses!



18.06.2015 M. Gross, M. Krasilnikov
09:42 Gun and boost
150 laser pulses
laser shutter open
Boo.V1 open
Laser pulse train ends behind booster RF pulse

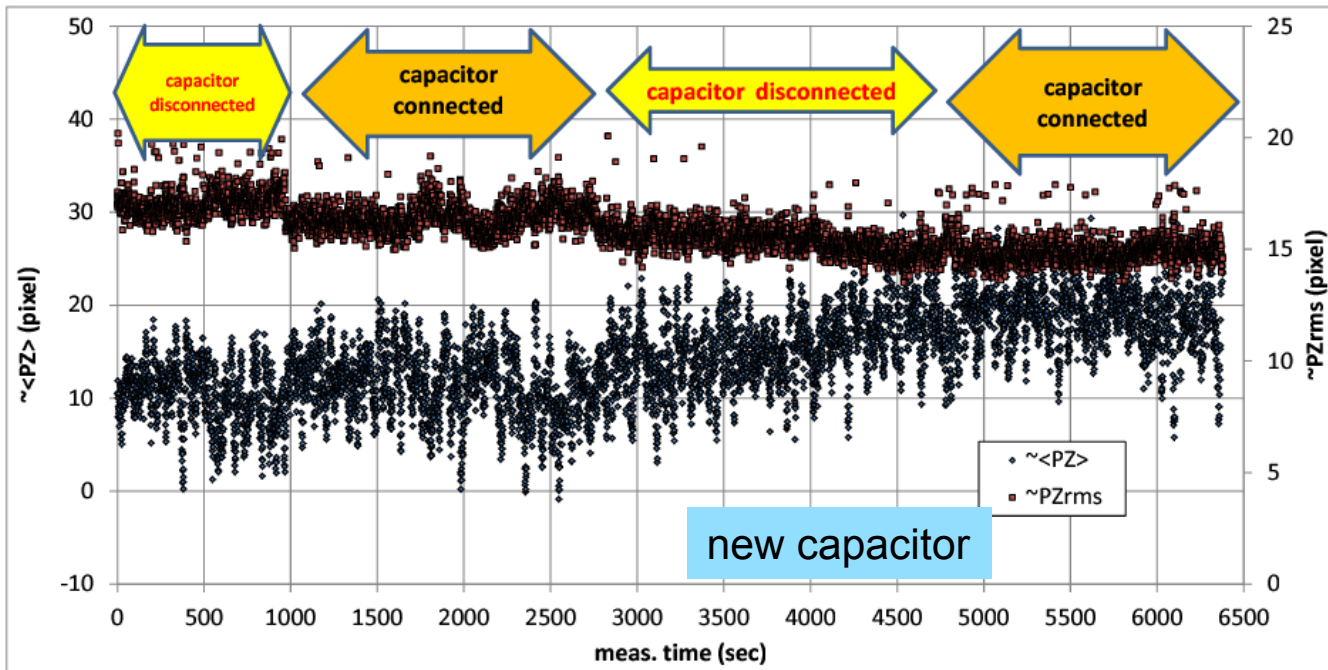


- Two BBO crystal movements necessary (17M, 19M) due to hotspots
- Quick damage was caused by often use of long pulse trains during emittance measurements
- Another complete laser alignment + BBA on Sunday

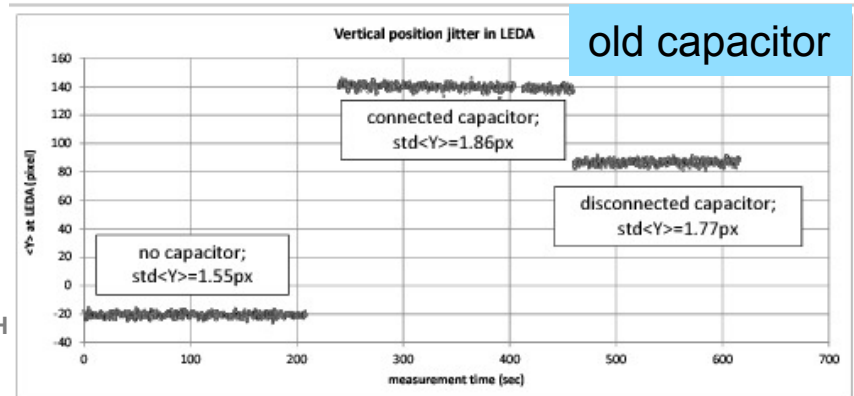


New LEDA capacitor

- Can always stay connected
- Small effect on measured momentum (several keV over 6 MeV; smaller than noise)

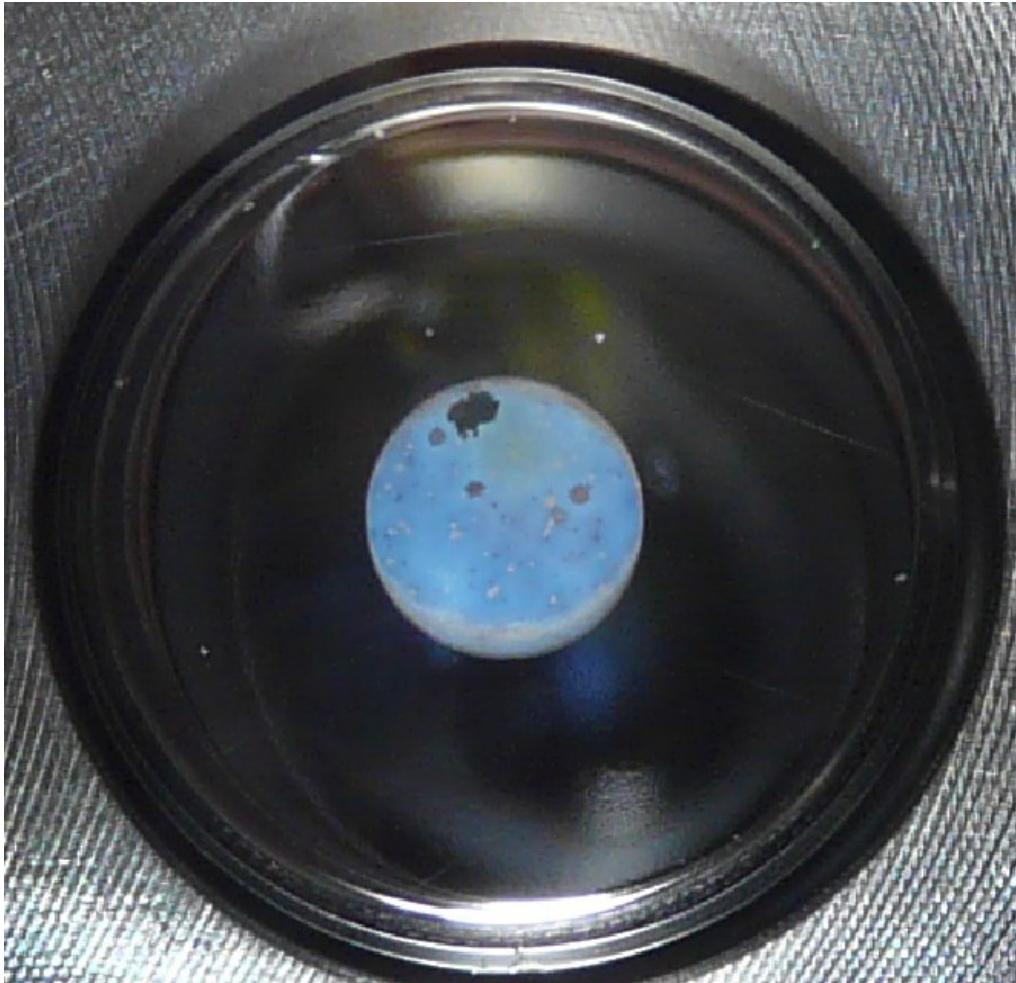


Beam stability measurements in LEDA:

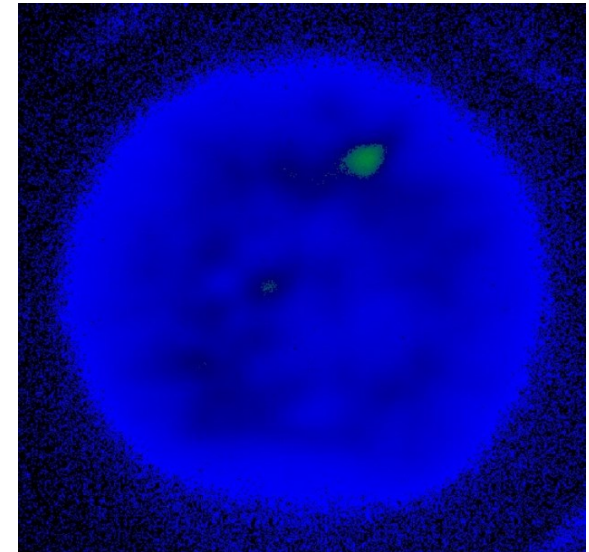


Holger H

Cathode #663.1 damage

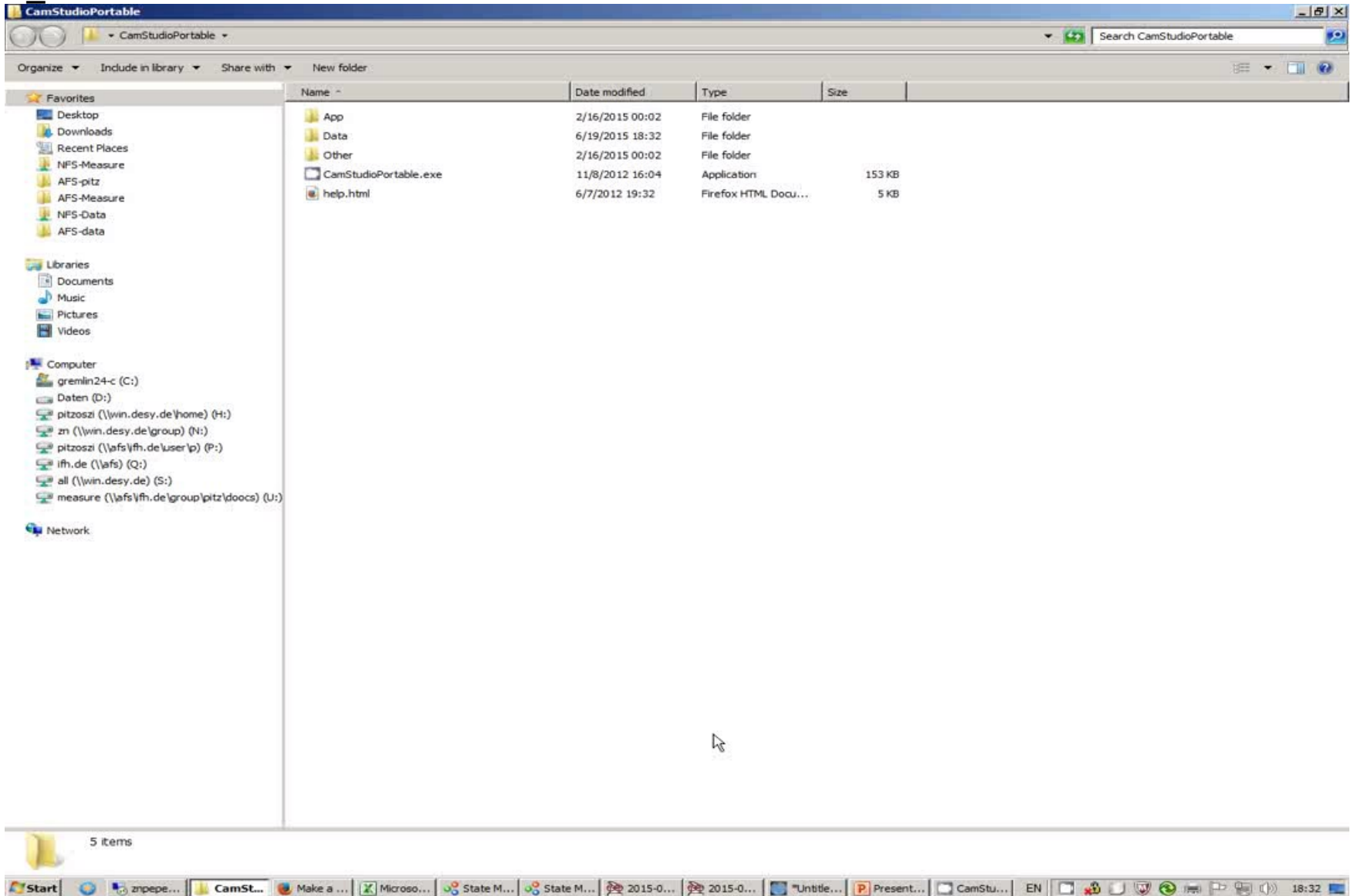


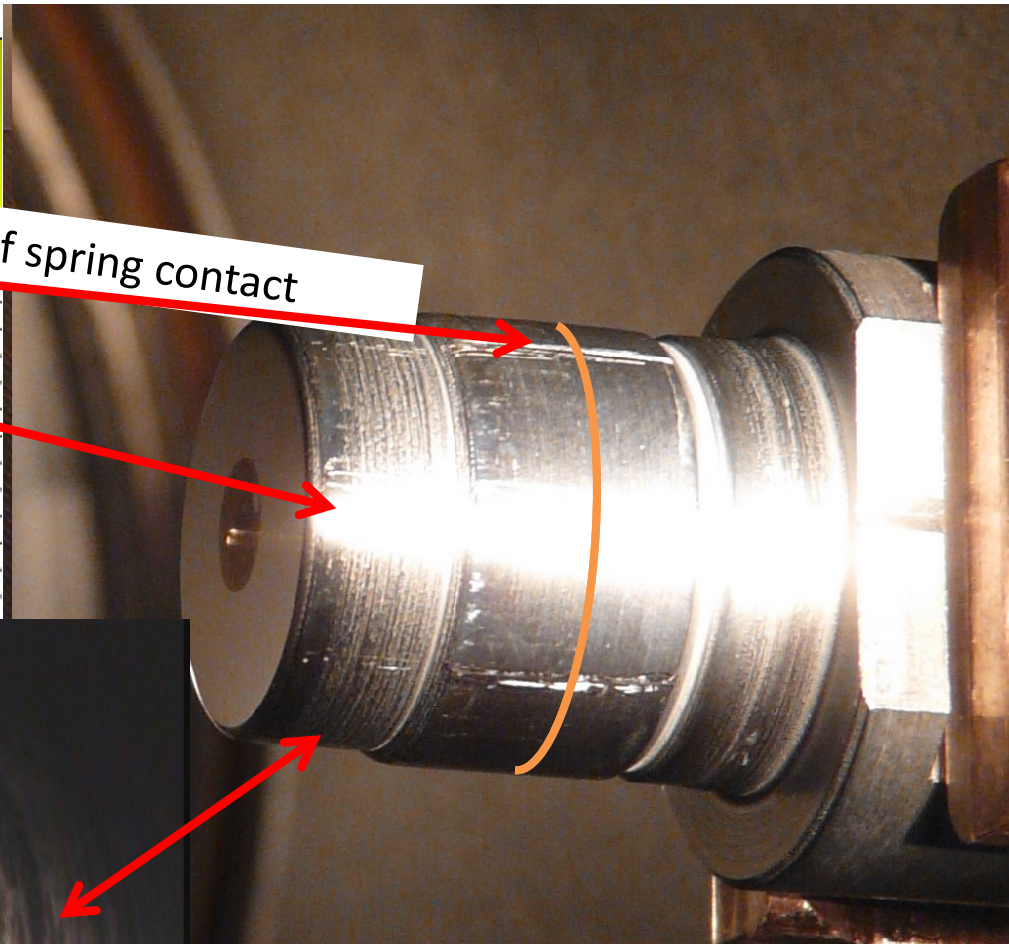
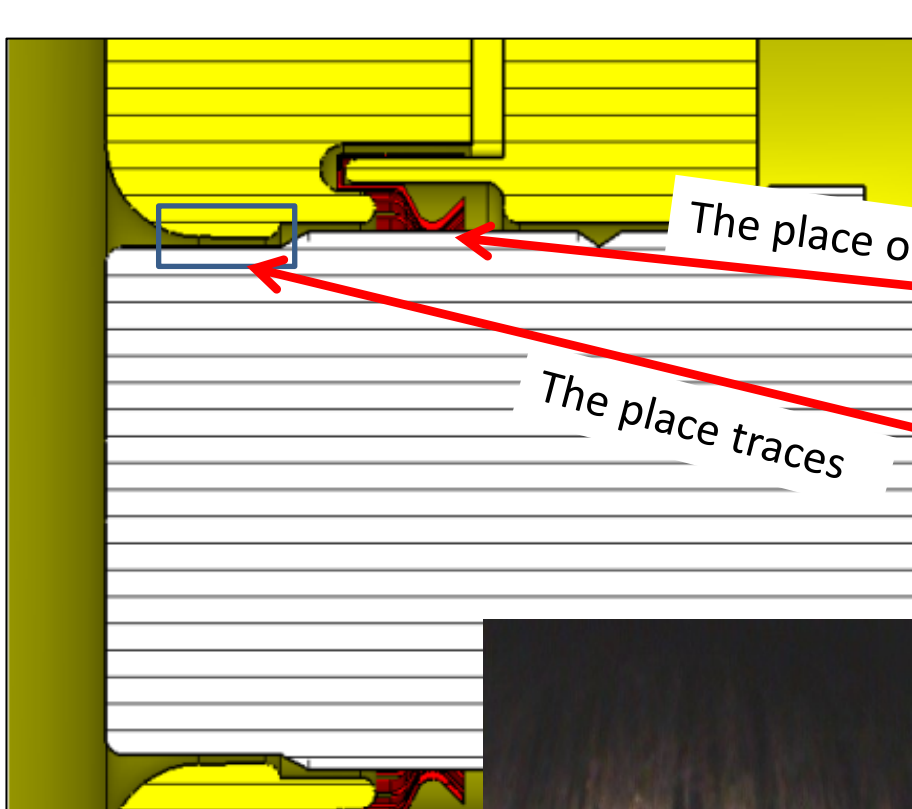
- Spots correlate with QE map and with „electron microscopy“ image on Low.Scr2
- Also damage on Mo-plug...



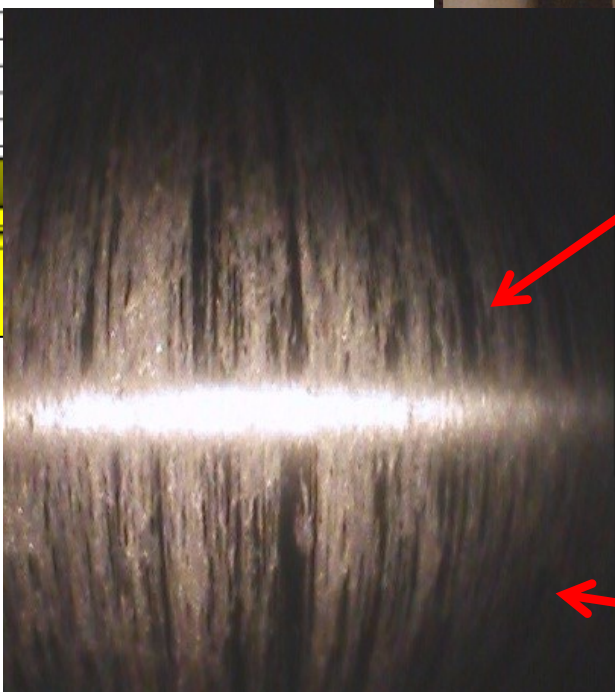
Cathode #663.1 damage

http://pitzlb.ifh.de:8080/PITZelog/data/2015/25/19.06_M/2015-06-19T18:48:22-00.avi

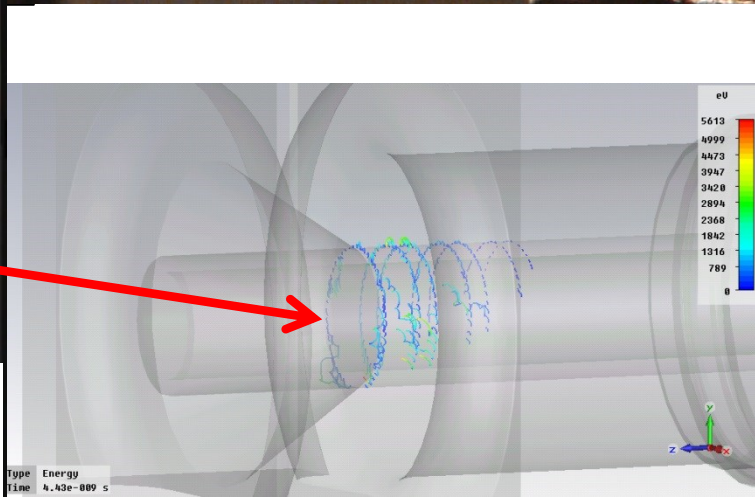




The traces on the cathode look pretty similar to the traces on coupler antenna after operation with extremely high DC with the gun 3.2. Most probably such traces are made by a discharge.

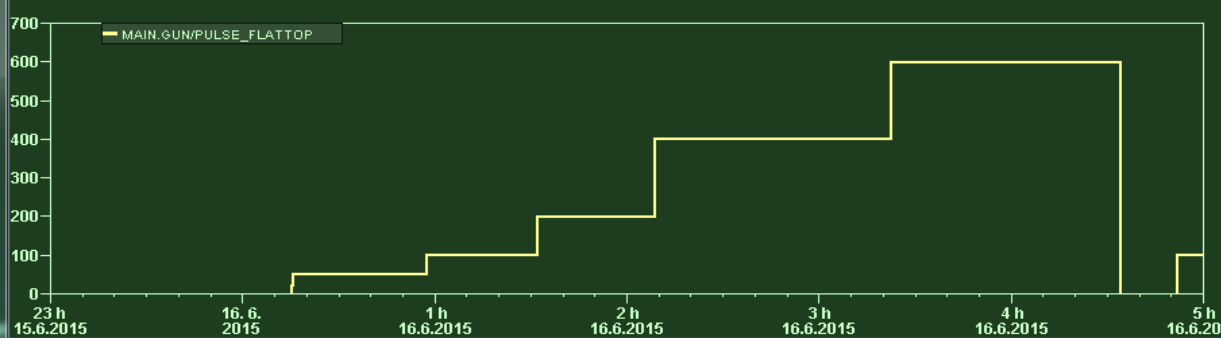
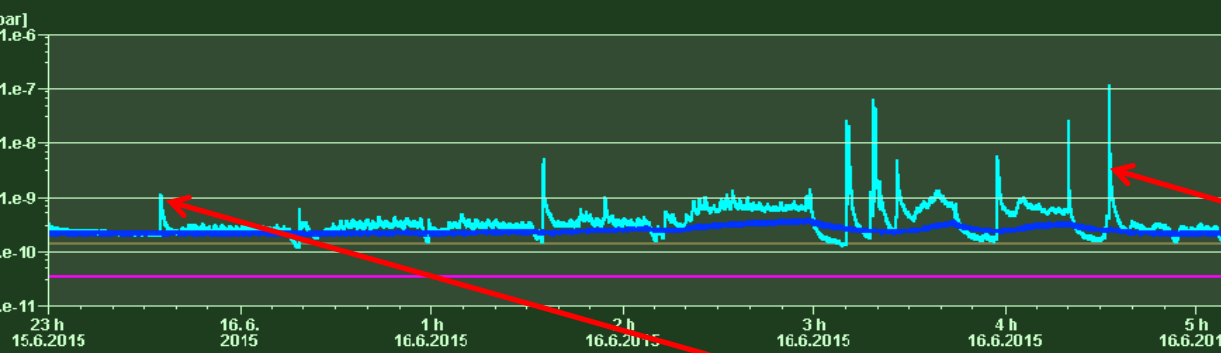
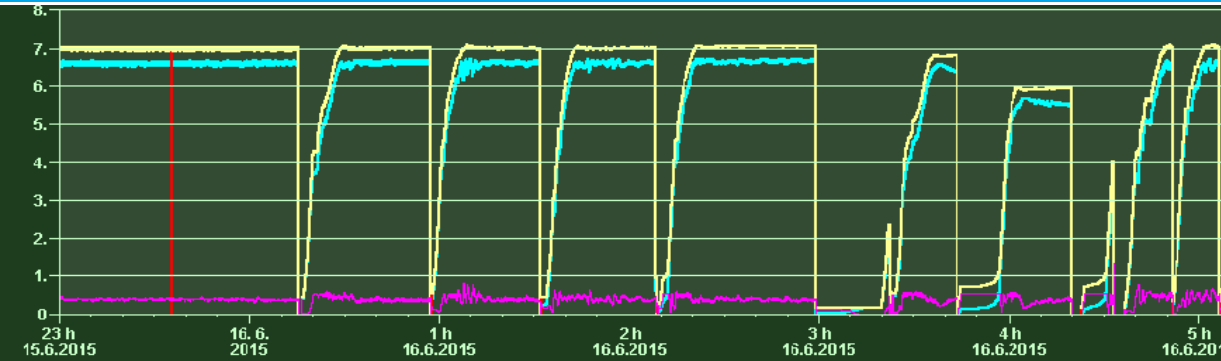


The coaxial coupler from the gun3.2



Possible causes of cathode grooves

1. Three gun trips on 15./16.
2. Unusual vacuum activity during recovery from gun trip on Monday night
 - Esp. at 0.2 MW, 400 us
 - Only during solenoid sweep



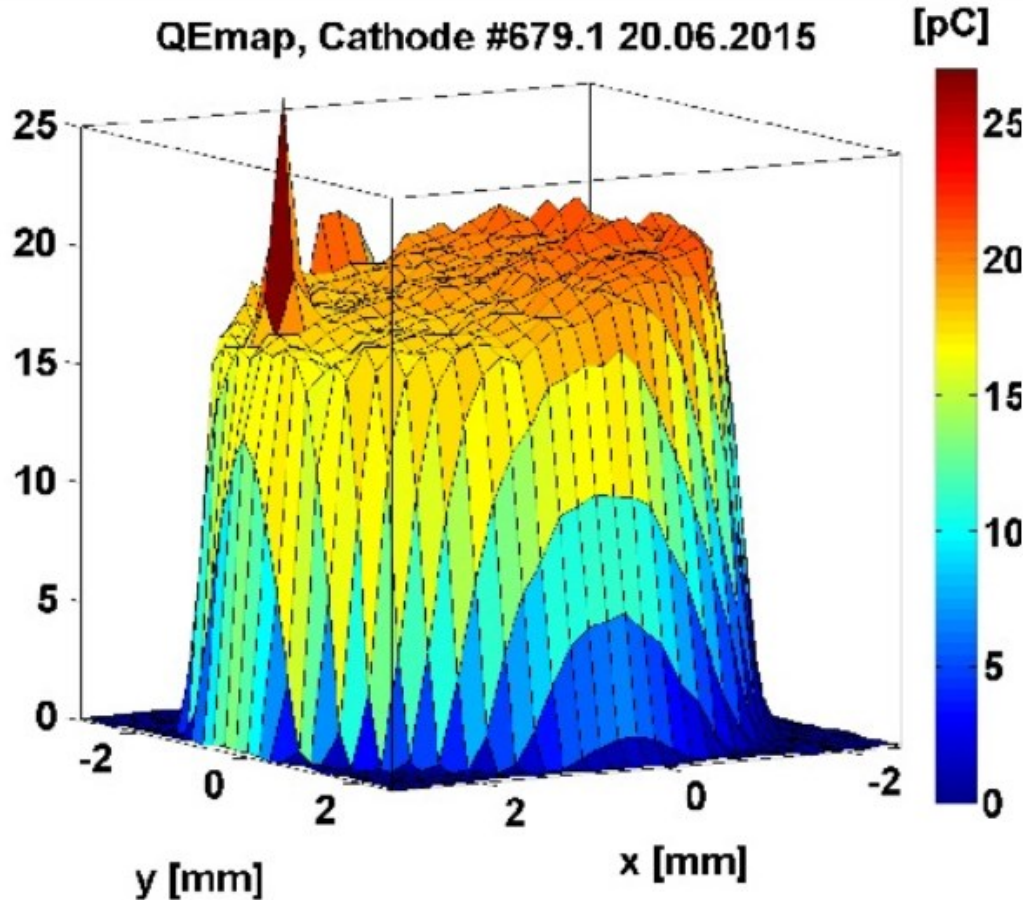
Third trip

Start of solenoid sweeping

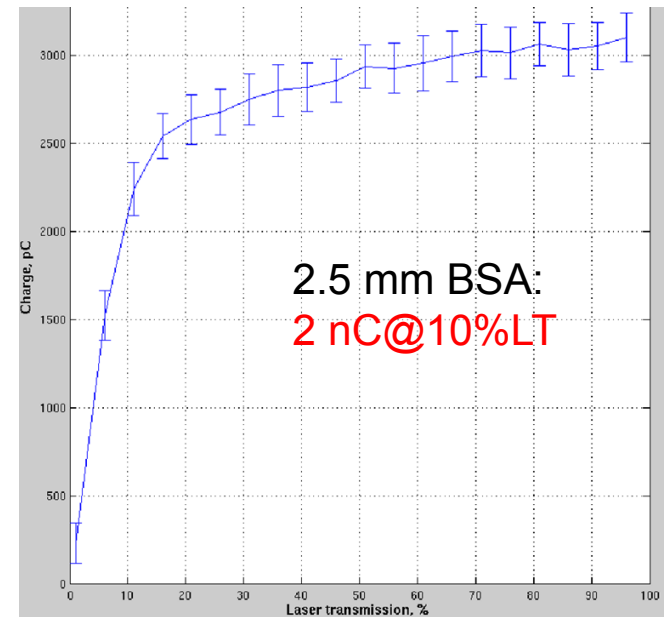


New cathode #679.1 (since Friday)

horizontal slope (range ~25%), and one hotspot at [+2 mm, -1 mm] (~25%)

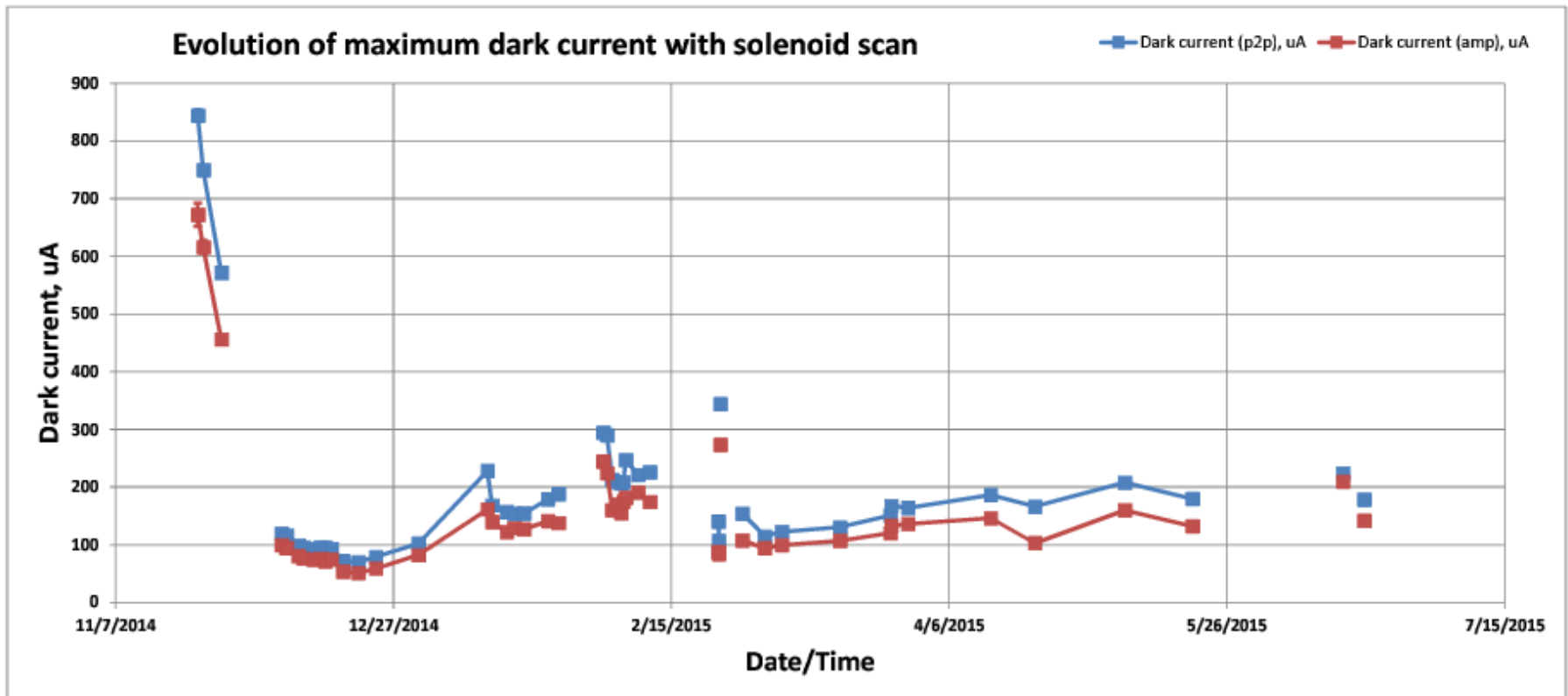


- QE ~10.5% (last: 2.7%)
- For laser BBA, 1.1MWg is **not** enough!
- >3 nC extracted (after another laser alignment)



New cathode #679.1 (since Friday)

5/19/2015 19:05	160/200	6.33	330	179.9	1.4	330	132.4	2.4
Cathode 663.1 (Cs2Te) is reinserted 10.06.2015								
6/15/2015 20:50	160/200	6.38	360	224.1	2	360	210.2	2.2
New cathode 679.1 (Cs2Te) is inserted 19.06.2015								
6/19/2015 16:10	160/200	6.38	370	178.5	1.5	370	142.1	2.1



New cathode #679.1 (since Friday)

#663.1 #679.1

Charge, nC	BSA, mm	~Emittance, μm
1.00	1.6	1.3
0.50	1.2	0.8
0.25	1.1	0.6
0.10	0.8	0.4
0.02	0.5	0.35

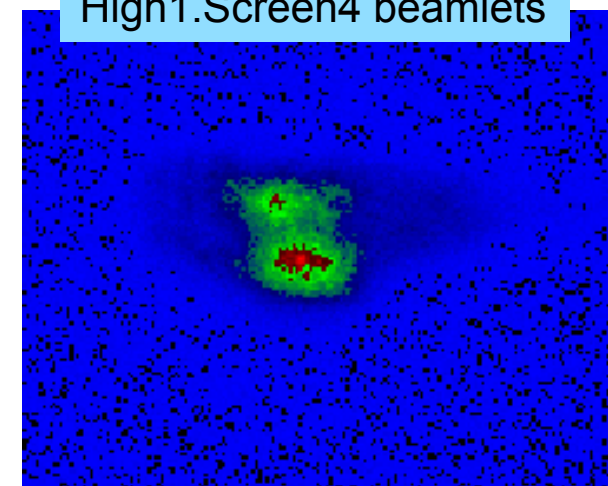
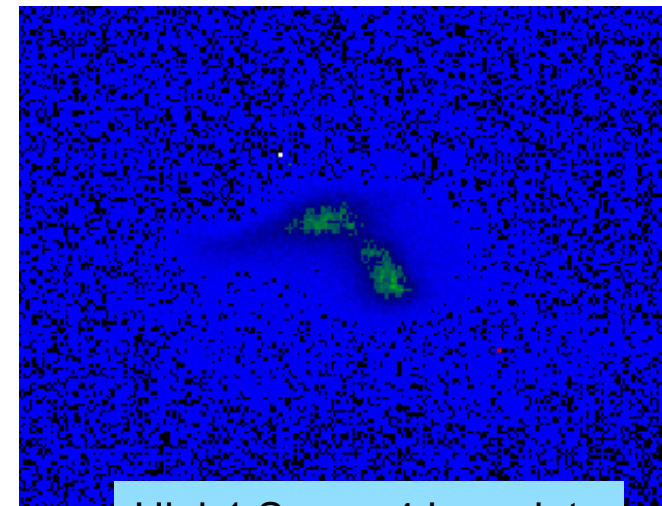
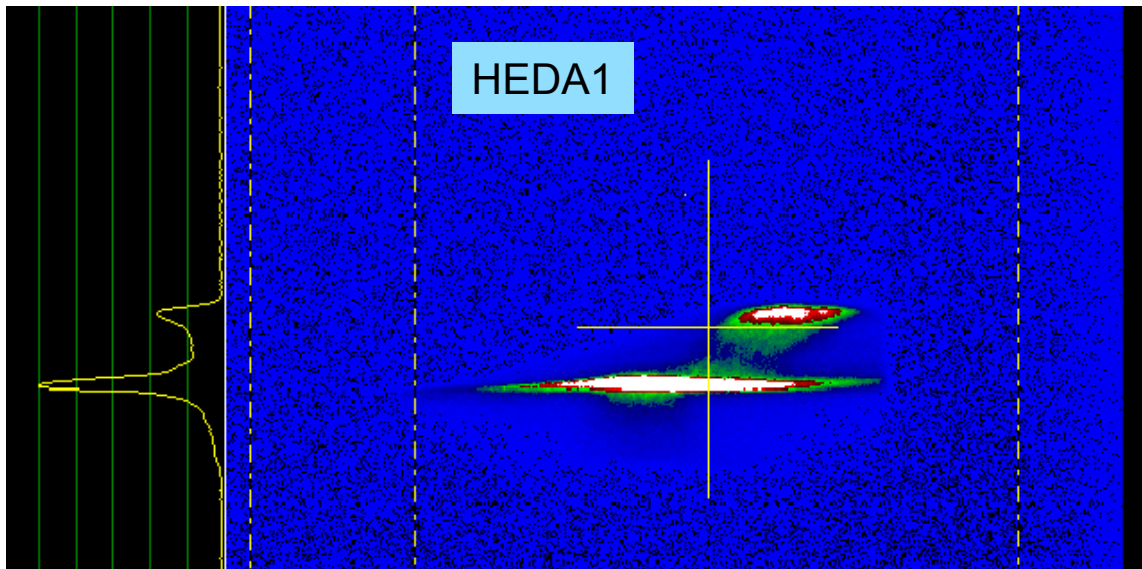
1.8 μm

1.2 μm

Measured emittance much higher (~50%) than during the last few months!

Further tests with 500 pC, 1.2 mm BSA:

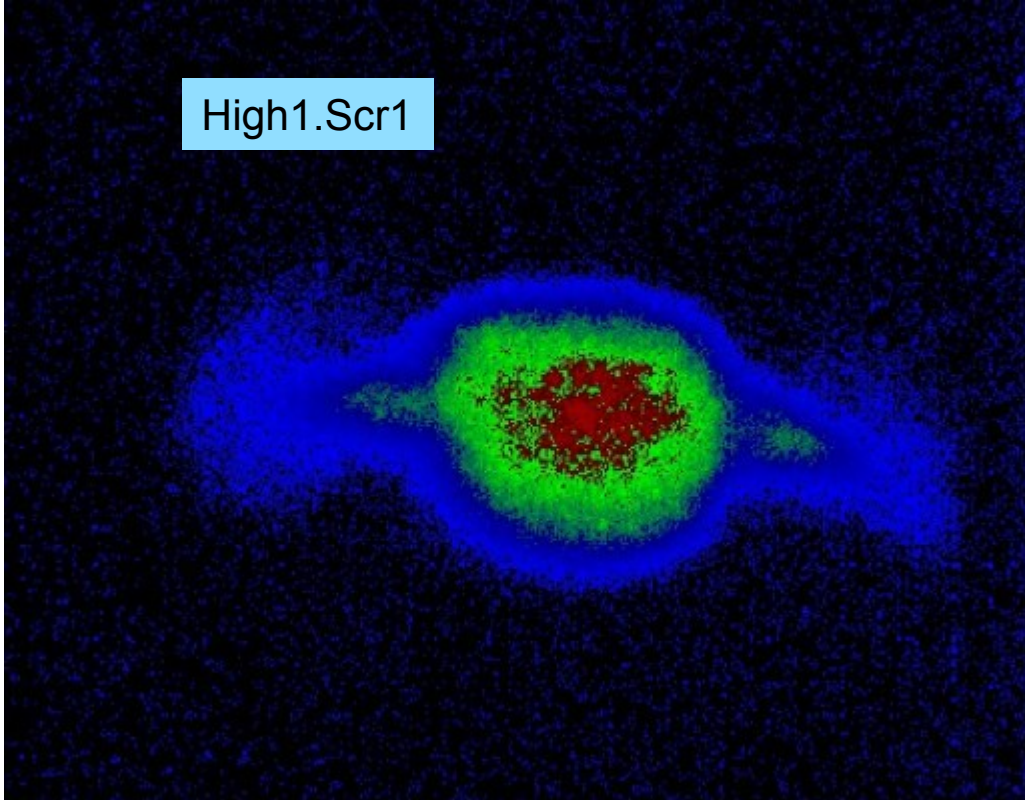
- 1.2 mm vertical laser spot displacement on cathode: Emittance 0.99 μm
- Complete realignment of laser, laser transport and e-steering: 1.11 μm



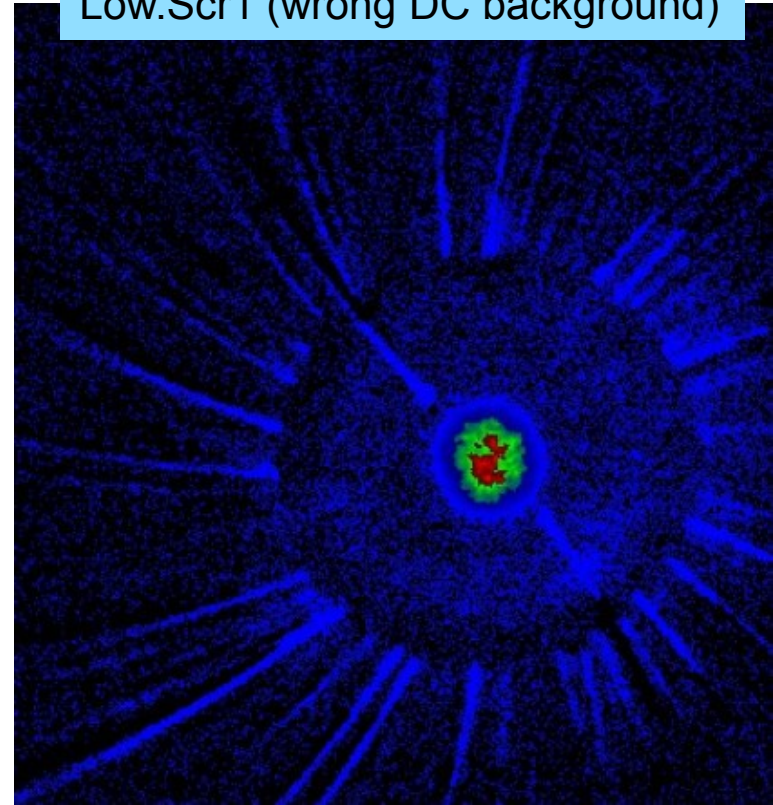
Results so far:

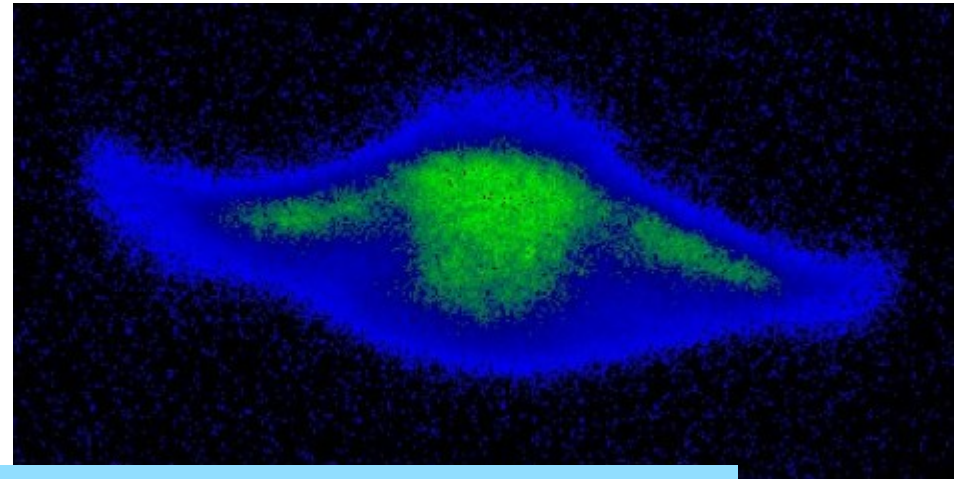
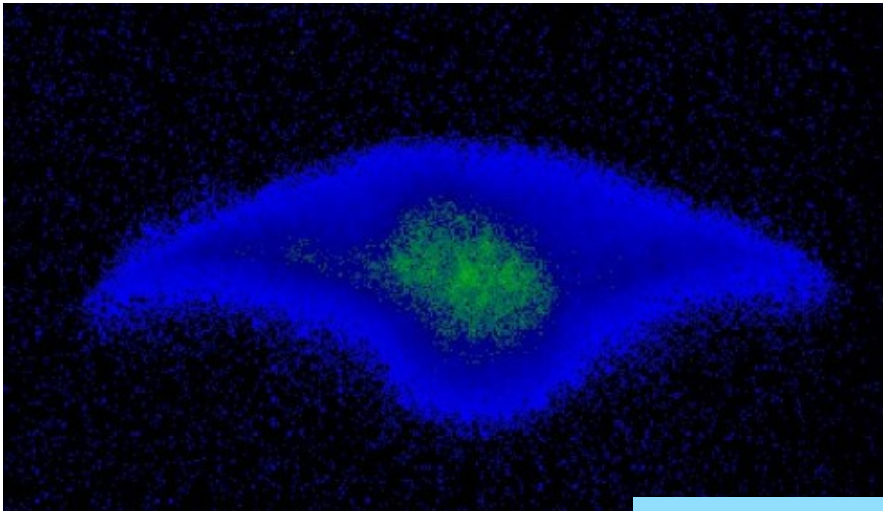
- Steering has little effect on structure
- Vertical laser offset strongly changes symmetry / tilt
- VC2: strong position jitter with open BSA ($\sim 50\mu\text{m}$ rms), just intensity jitter ($\sim 2\%$) with BSA=1.2 mm
- Phase scans did not show temporal satellites
- Low.Scr2,3: tilt observed, depending on solenoid
- LEDA: tilt, depending on phase, no double peak
- „Horns“ of e-beam on High1.Scr1 can be modified by apertures in low section

High1.Scr1

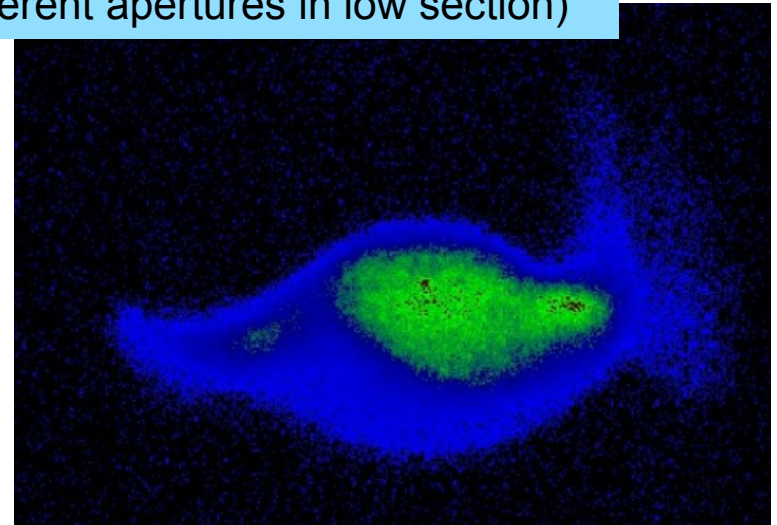
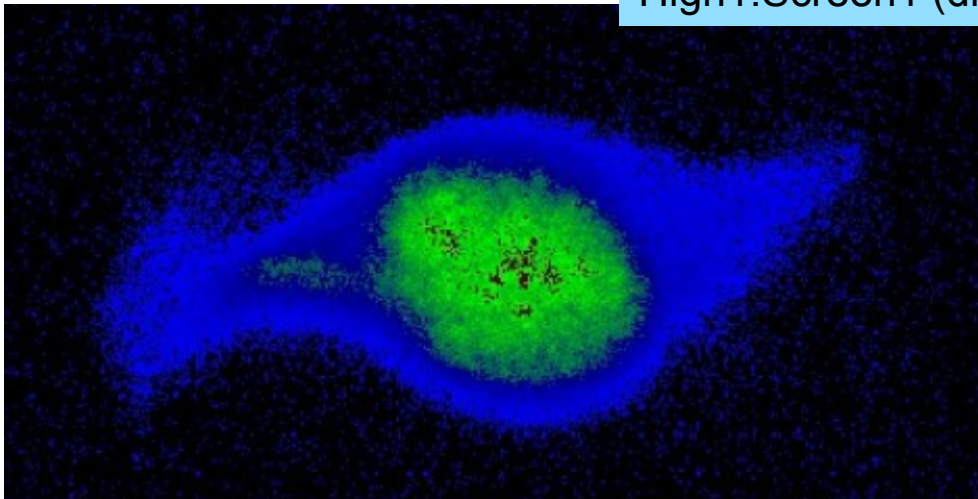


Low.Scr1 (wrong DC background)





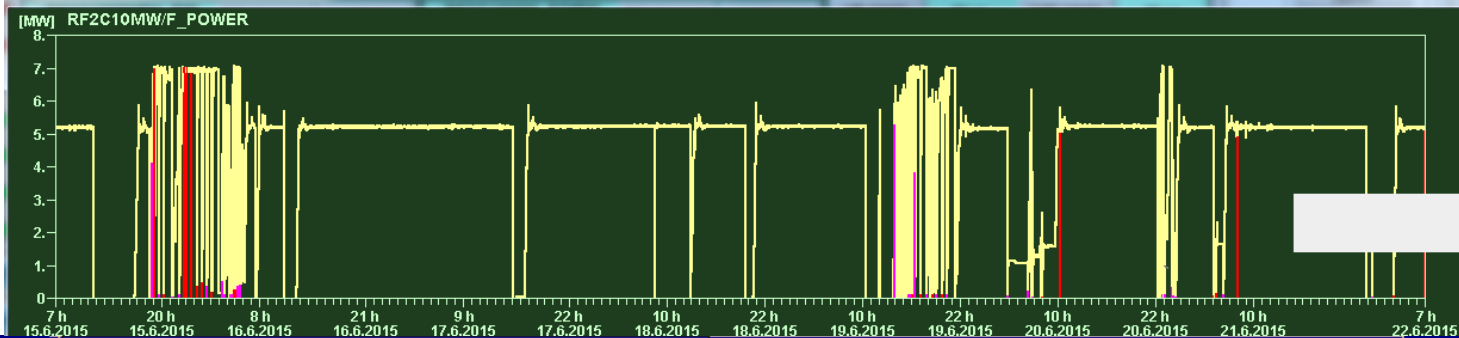
High1.Screen1 (different apertures in low section)



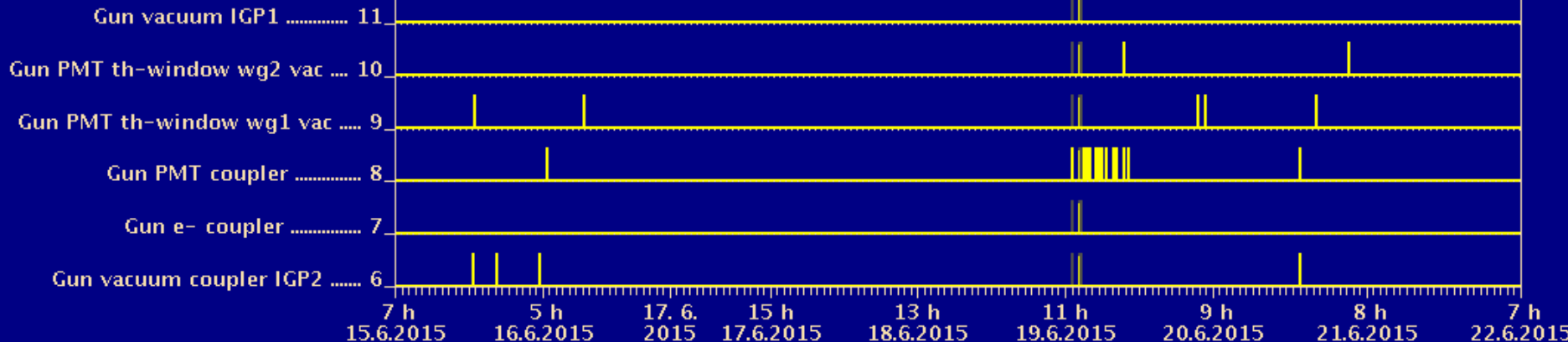
History of the Week

Interlocks due to

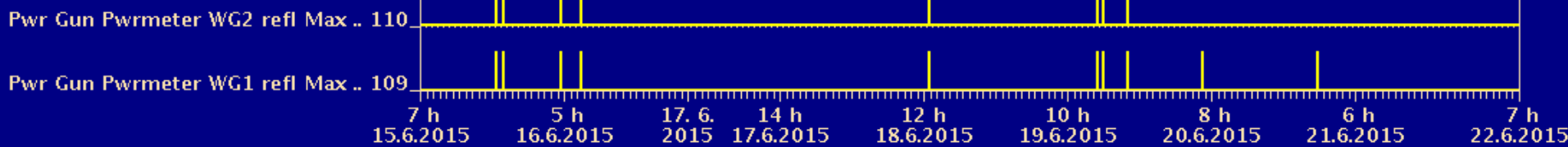
- 4 gun trips (and recovering from them)
- Photocathode exchange & conditioning
- 7x Thales window PMT (and e-det close to threshold)
- 1xRF1 klys.spark



— GUN/DP1.SG1.SIG [interlock flags (OK = Null)]



— KLYS_2/SDO.PL96.119 [interlock flags (OK = Null)]



to do:							
Week 27	Mon Jun-29	Tue Jun-30	Wed Jul-01	Thu Jul-02	Fri Jul-03	Sat Jul-04	Sun Jul-05
Morn. 7:00 to 15:30	Rublack Kalantaryan	Rublack Kalantaryan	Rublack Kalantaryan	Rublack Kalantaryan	Krasilnikov Kalantaryan	Krasilnikov Kalantaryan	Krasilnikov Kalantaryan
Late 15:00 to 23:30	Huck Rimjaem	Huck Rimjaem	Huck Rimjaem	Huck Rimjaem	Huck Pathak	Huck Pathak	Huck Pathak
Night 23:00 to 7:30	Renier Zhao	Renier Zhao	Renier Zhao	Renier Zhao	Boonpornpras Zhao	Boonpornpras Zhao	Boonpornpras Zhao
Resp. Phys							
Laser	Gross	Gross	Gross	Gross	Gross	Gross	Gross
RF	Jachmann	Jachmann	Jachmann	Jachmann	Jachmann	Jachmann	Jachmann
Vaku.	Philipp	Philipp	Philipp	Philipp	Philipp	Philipp	Philipp
Contr.	Kalantaryan	Kalantaryan	Kalantaryan	Kalantaryan	Kalantaryan	Kalantaryan	Kalantaryan
Electr.	Tonisch	Tonisch	Tonisch	Tonisch	Tonisch	Tonisch	Tonisch
Infrast.	Hoffmann	Hoffmann	Hoffmann	Hoffmann	Hoffmann	Hoffmann	Hoffmann
SSB	Huck	Huck	Huck	Huck	Huck	Huck	Huck
Schichtabsich	Good	Good	Good	Good	Vashchenko	Vashchenko	Vashchenko
Issued on 11-Jun-2015				A gray field means the status has changed since the last version			

- TDS commissioning!
- Fix e-beam (re-insert cathode?)
- Emittance measurements for 2 nC (?)
- ...