

ARES Operation Meeting

Summary of week 3

Willi Kuropka, on behalf of the ARES shift crew

Summary

Week 2

	Monday 11 th January	Tuesday 12 th December	Wed. 13 th December	Thursday 14 th December	Friday 15 th December
Achievements/Overview		<ul style="list-style-type: none">Start-upInvestigation if laser position on cathode has an influence on secondary beam	<ul style="list-style-type: none">Establish beam up to dipole spectrometerInvestigate spectrum of the beam	<ul style="list-style-type: none">Investigate secondary beamQuad scansFC and DaMon signals	<ul style="list-style-type: none">QE measurementVelocity bunching working point
Difficulties			<ul style="list-style-type: none">Magnet power supply problems		
Notes					

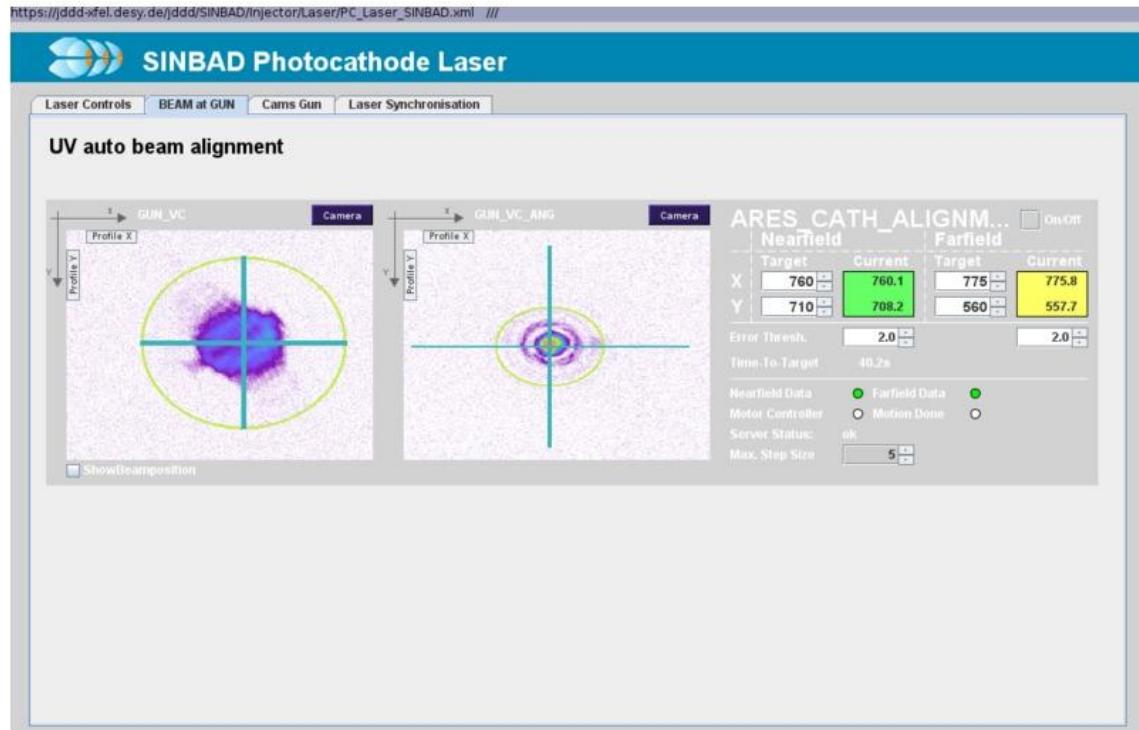
Summary

Week 3

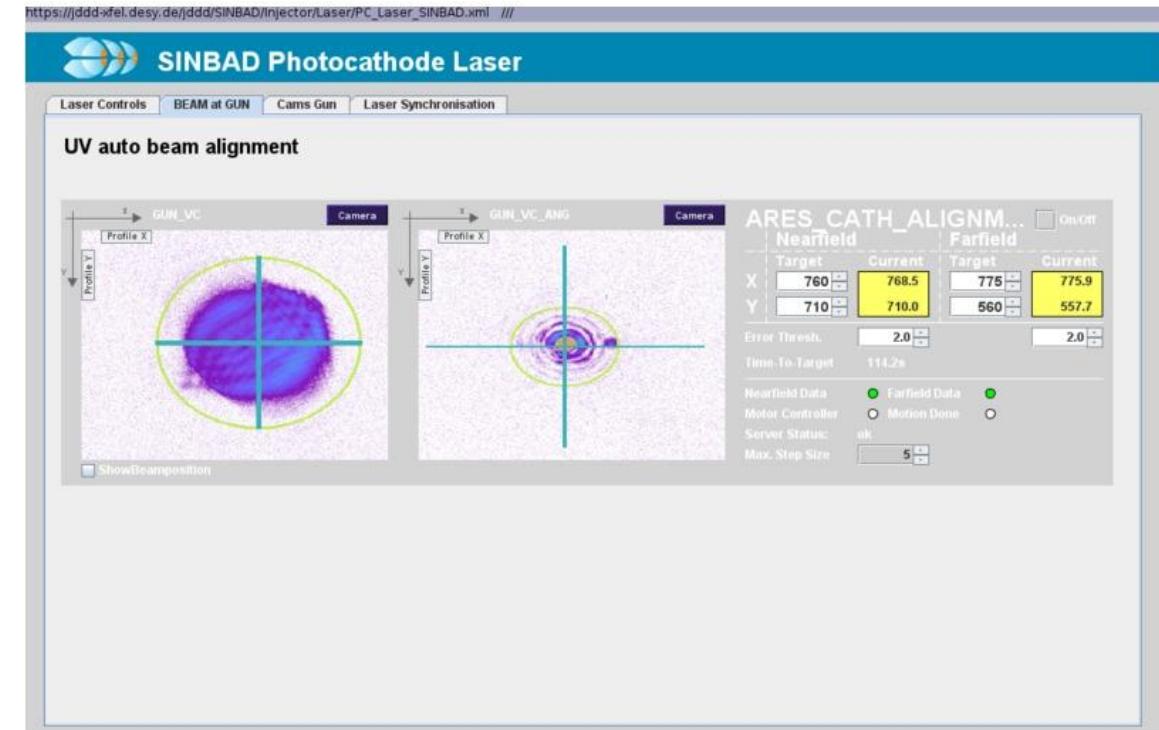
	Monday 18 th January	Tuesday 19 th December	Wed. 20 th December	Thursday 21 st December	Friday 22 nd December
Achievements/Overview	<ul style="list-style-type: none">• Cathode laser investigation (secondary pulse)• Alignment of additional larger apertures	<ul style="list-style-type: none">• Investigate secondary beam	<ul style="list-style-type: none">• Investigate secondary beam• Also on the cathode laser	<ul style="list-style-type: none">• Investigate secondary beam• Gun solenoid moved• TWS1 SOL4 moved• Changed cathode laser pulse length	<ul style="list-style-type: none">• Investigate influence on beam of different laser pulse lengths• Gun solenoid realigned
Difficulties	<ul style="list-style-type: none">• No pre- or post-pulse measured with fast photodiode	<ul style="list-style-type: none">• Faraday cup configuration	<ul style="list-style-type: none">• Magnet power supply problems• Magnet middle layer server was down	<ul style="list-style-type: none">• IT problems, some tools are not useable• Gun solenoid alignment was not satisfactory	<ul style="list-style-type: none">• One of the bkr consoles is very slow• Still IT difficulties
Notes					

New cathode laser apertures

500um

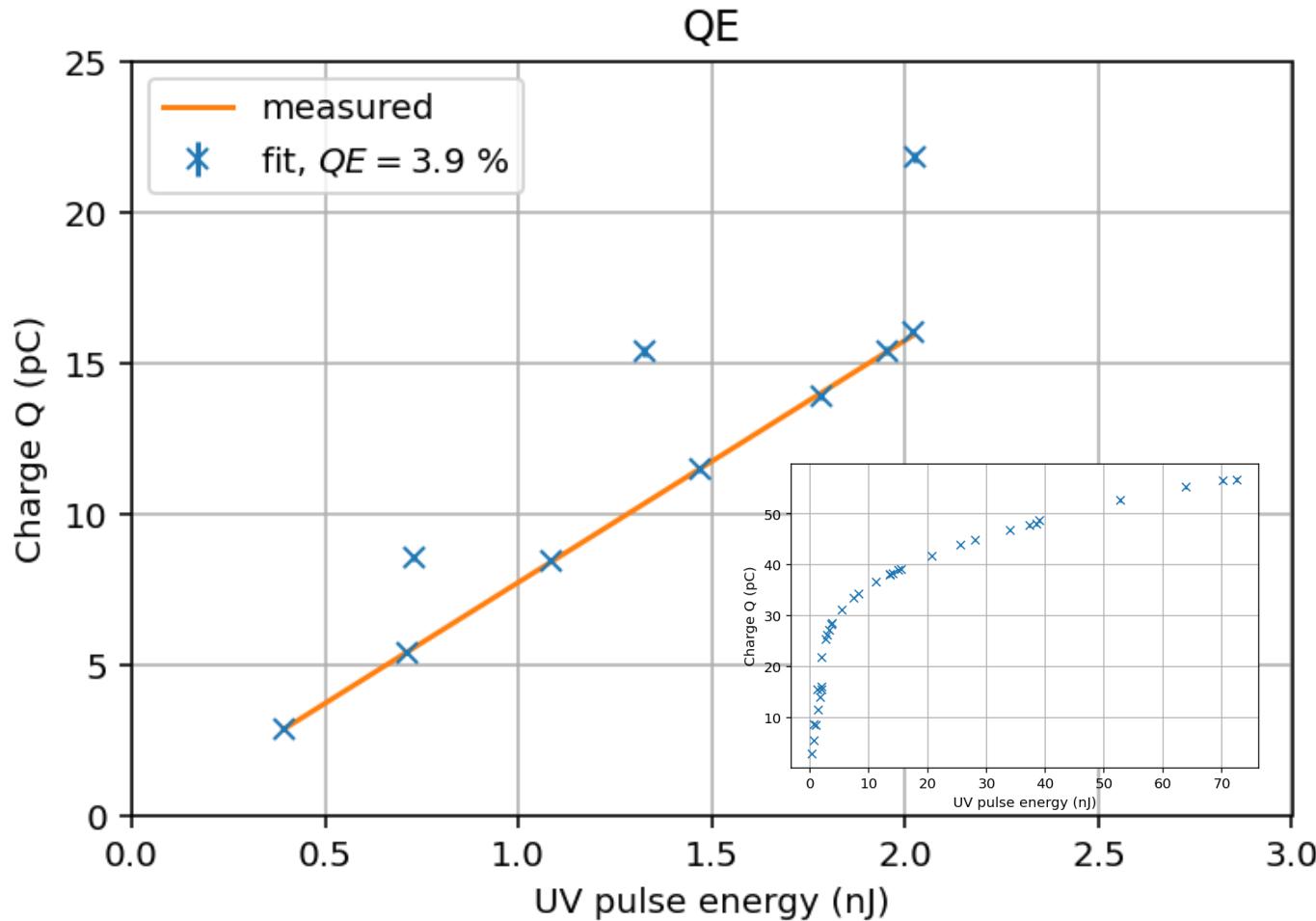


800um



QE measurement

Measurement from 2021.01.15



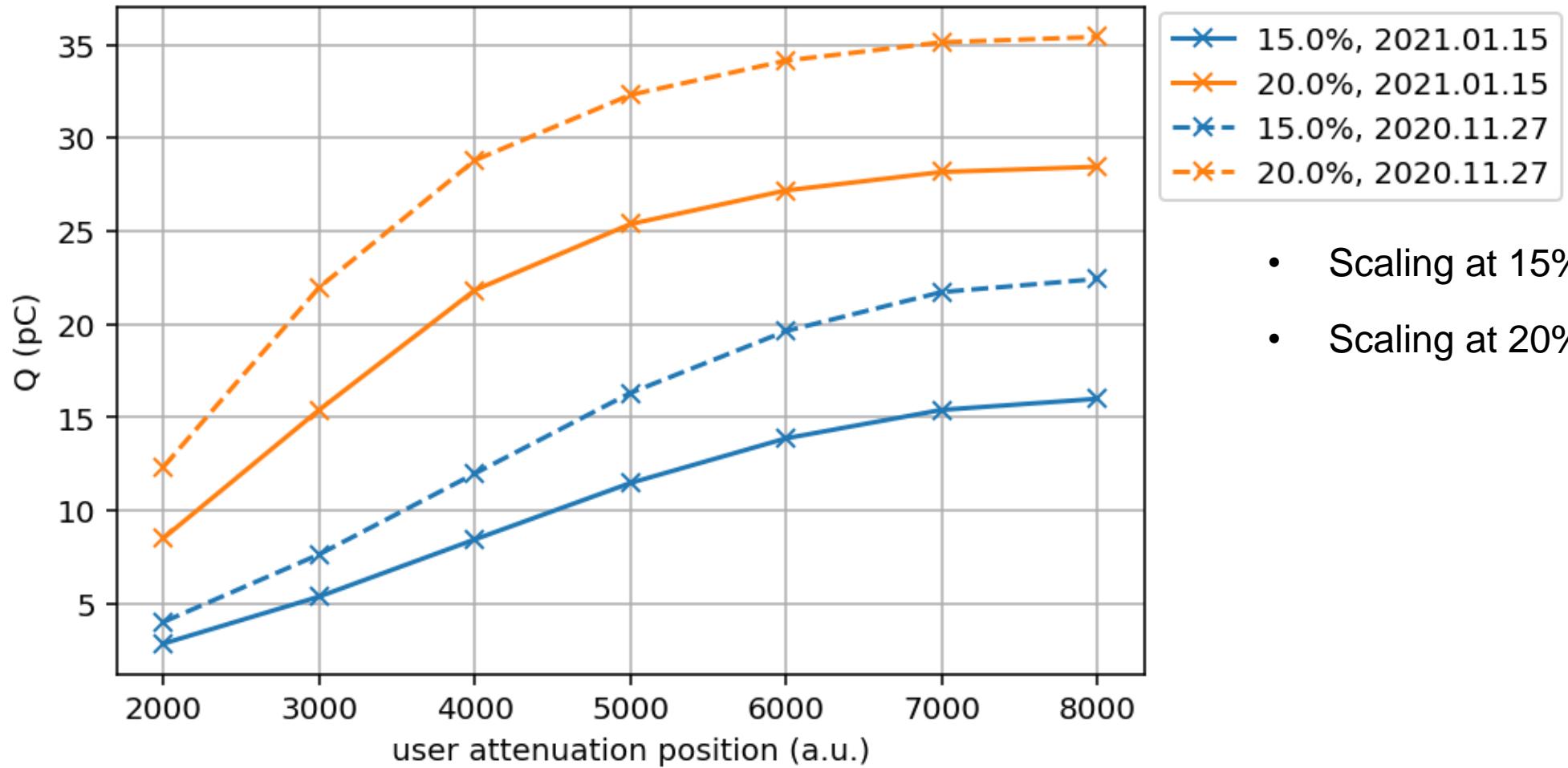
Issues:

- Transmission does not scale linearly
 - $T_{pharos} \in [0.76, 0.79]$,
 - $T_{aperture} \in [4.3 \times 10^{-2}, 5.1 \times 10^{-2}]$
 - $T_{tunnel} \in [7.6 \times 10^{-3}, 8.0 \times 10^{-3}]$
- Pulse energy only measurable at maximum output of internal attenuator
- QE between **4% and 6%**

Assumptions:

- Linear scaling of transmission along optical path (e.g. before and behind aperture)
- Interpolation/Extrapolation of internal attenuator output (no measurement at 15% int. attenuation)

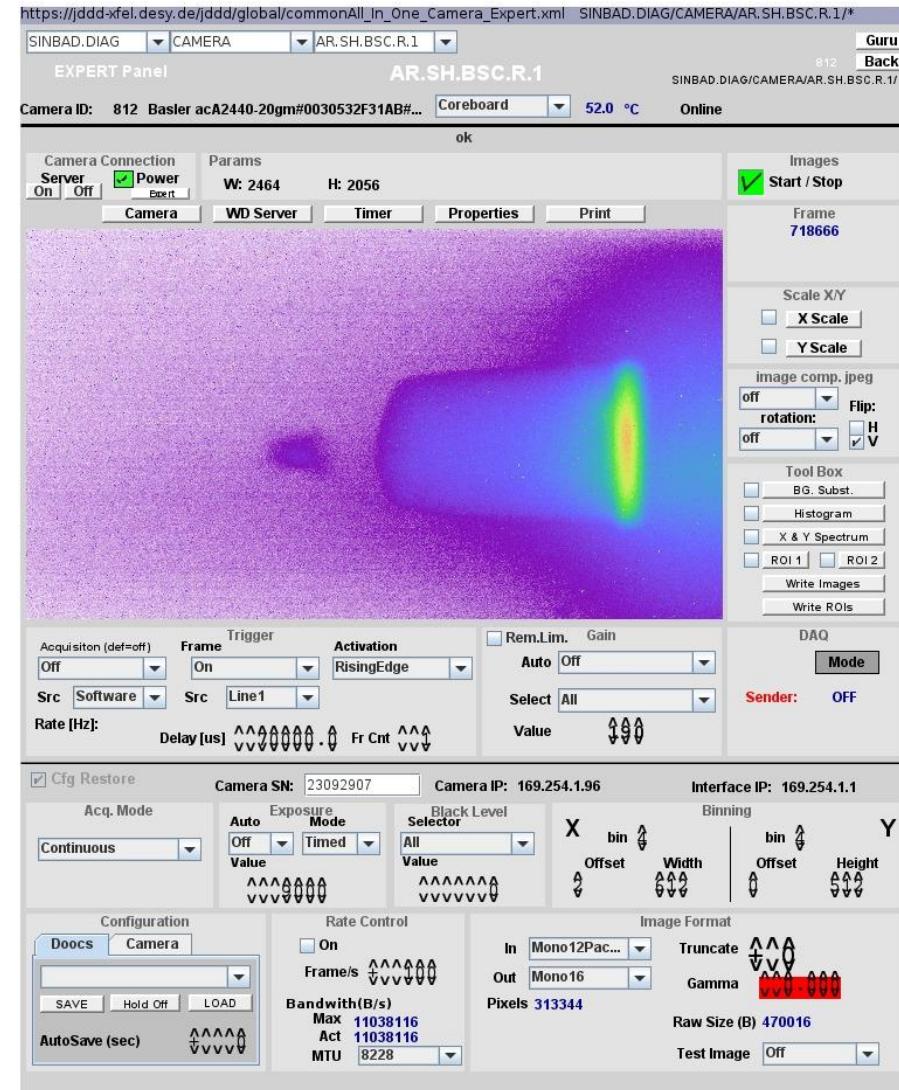
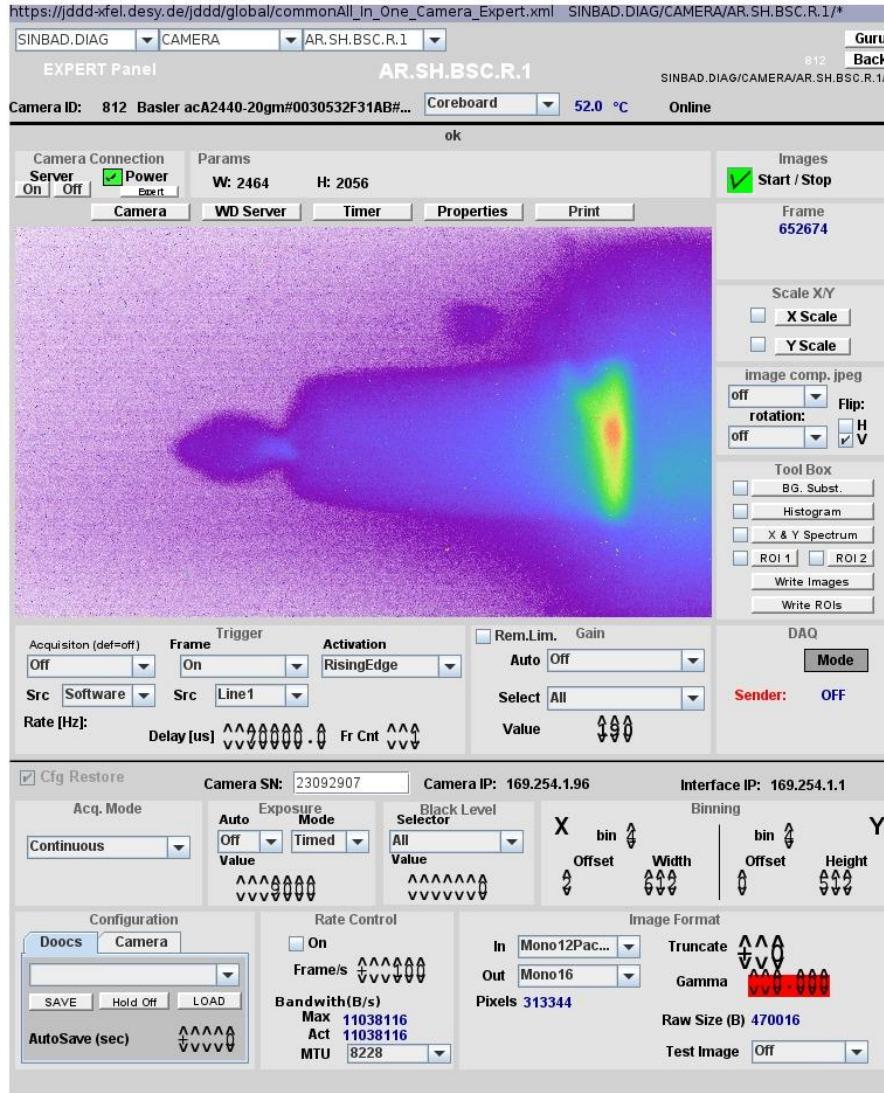
Comparison to last QE measurement



- Scaling at 15%: $(71 \pm 0.4)\%$
- Scaling at 20%: $(76 \pm 4.8)\%$

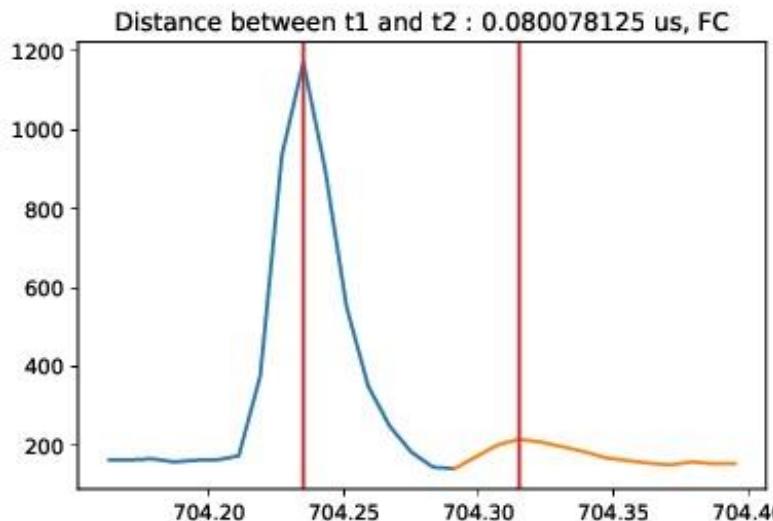
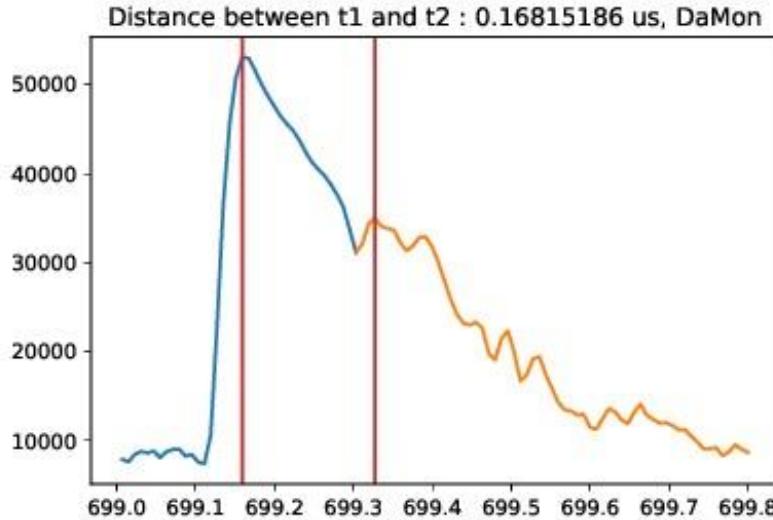
Secondary beam

After spectrometer dipole, for different laser attenuator settings

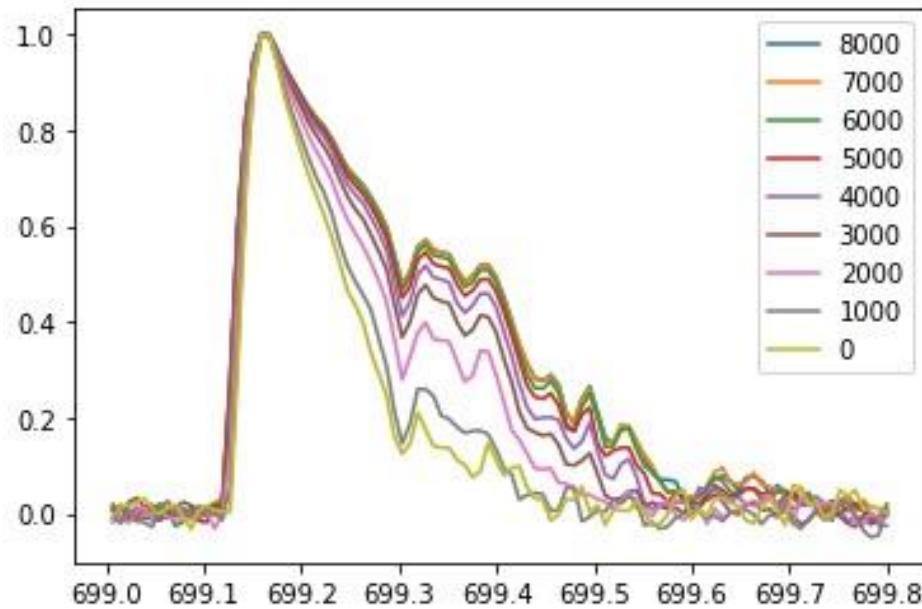


Secondary beam

On Faraday cup an DaMon



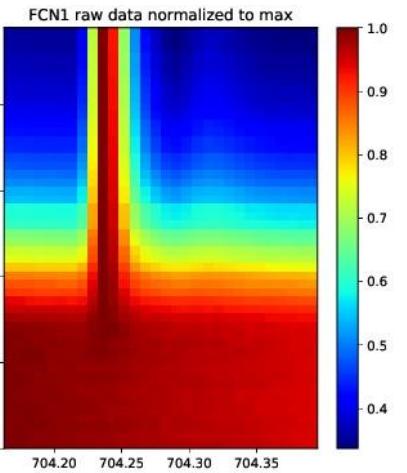
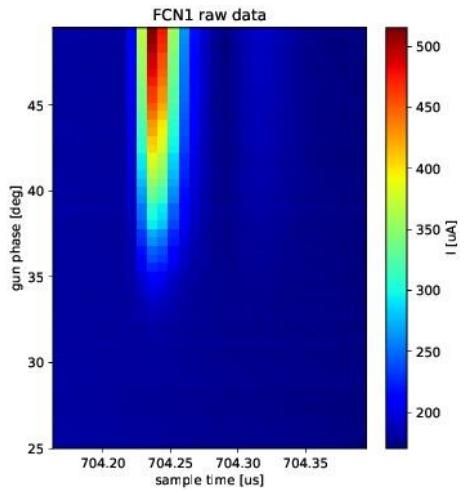
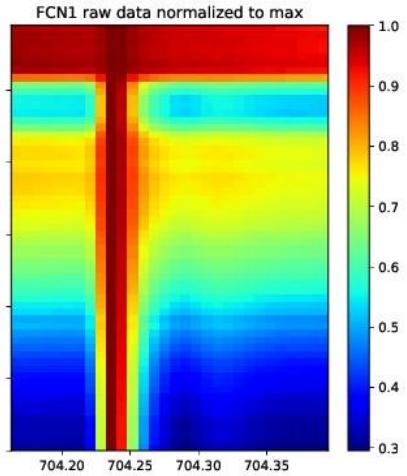
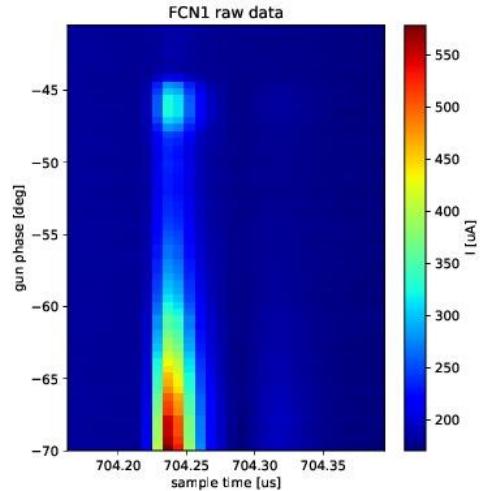
DaMon signal over laser att. position



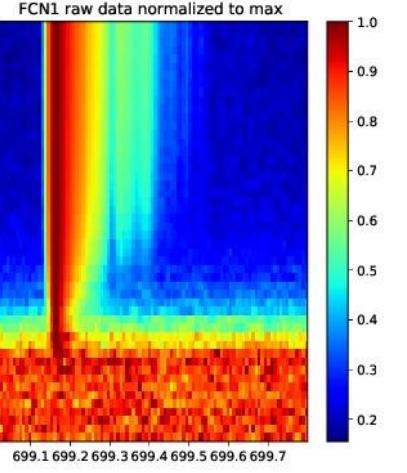
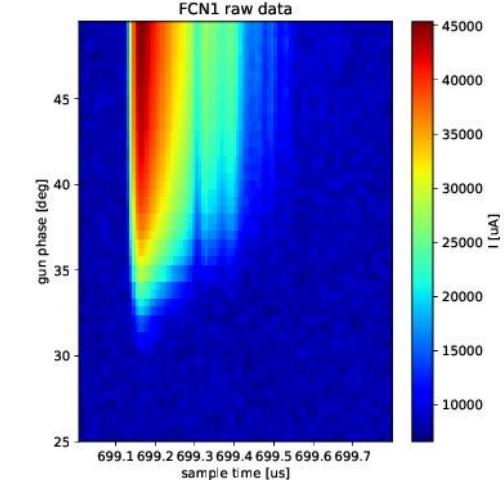
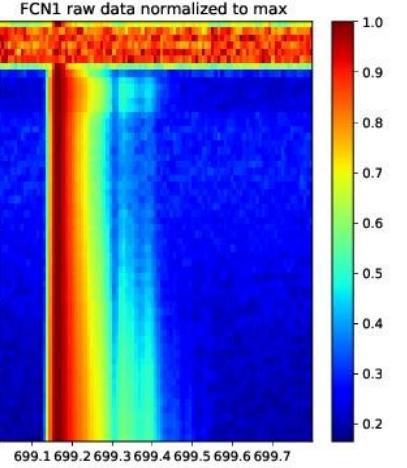
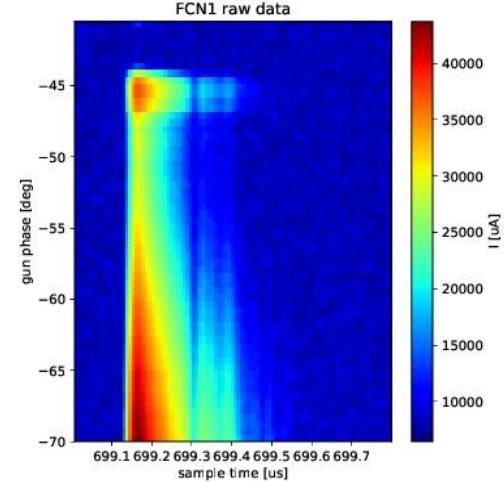
Secondary beam

gun phase scan

FC1

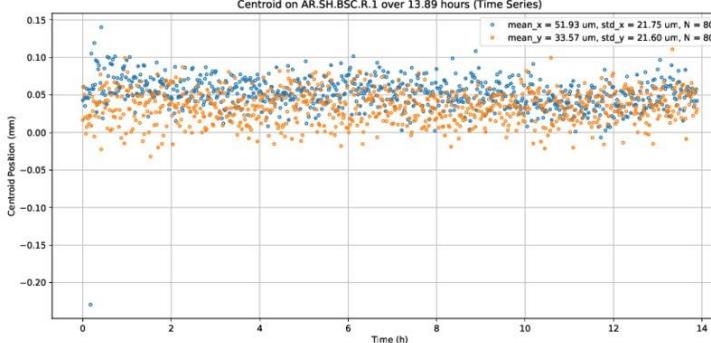
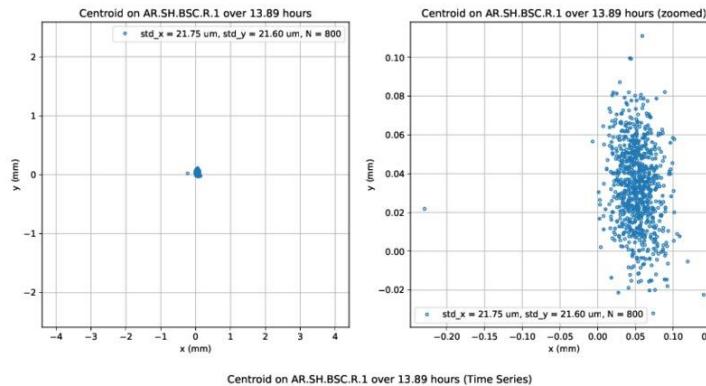
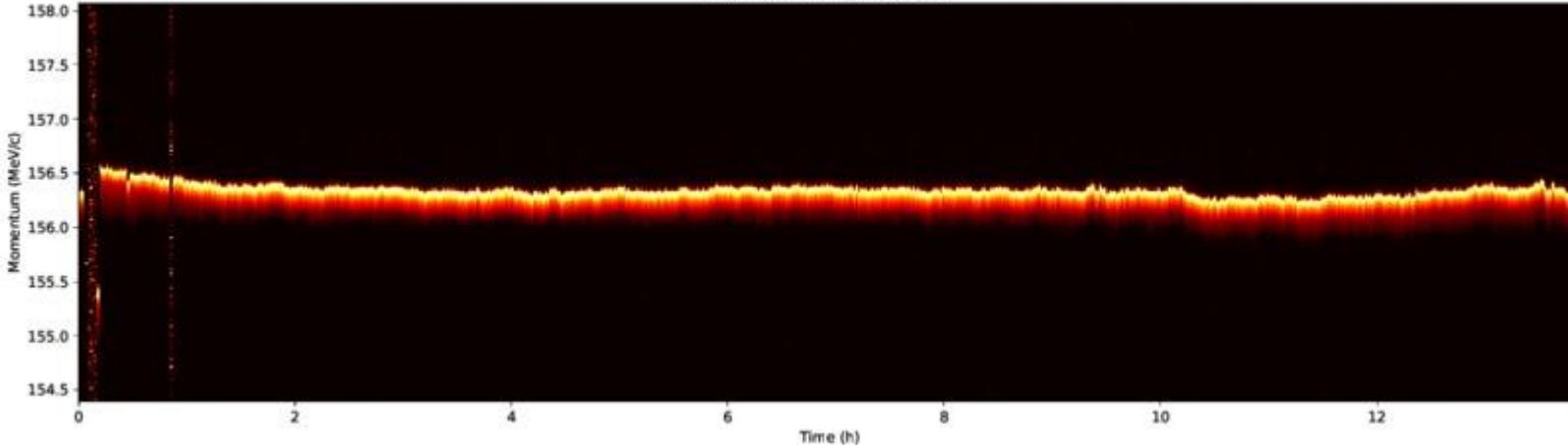


DaMon

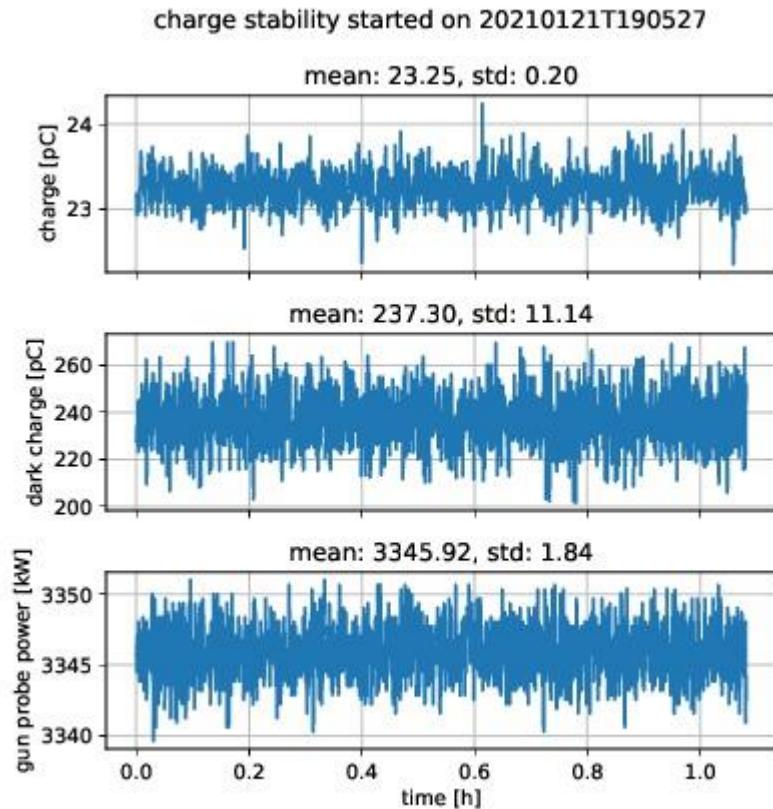


Stability measurements

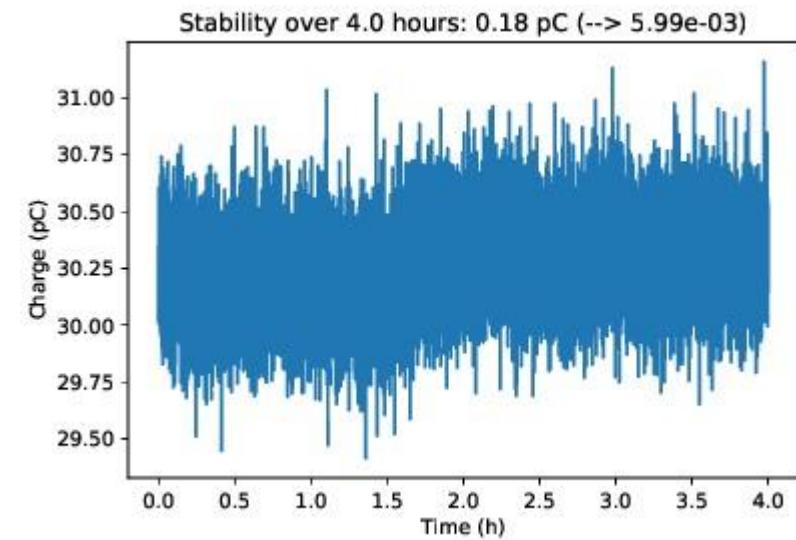
Mean momentum: 156.21 MeV/c
Momentum stability: 9.12 keV/c
Relative stability: 5.84e-05



Stability measurement



20.01.2021



Plan for this week

- Re-check timing of sec. bunch.
- MDI shift (to be clarified)
- Emittance measurements
- Check alignment of magnets
- Velocity bunching studies
- Charge stability measurements

Schedule

Week 4

Date	Shiftleader
25.1.	MKK1, MDI, FS-LA
26.1.	Hannes
27.1.	Frank
28.1.	Willi /MDI - shift
29.1.	Thomas

If you want to learn or join the shift: please give the shiftleader a call (2454)

Schedule

Januar 2021							
Nr.	Mo	Di	Mi	Do	Fr	Sa	So
53					1	2	3
1	4	5	6	7	8	9	10
2	11	12	13	14	15	16	17
3	18	19	20	21	22	23	24
4	25	26	27	28	29	30	31

Februar 2021							
Nr.	Mo	Di	Mi	Do	Fr	Sa	So
5	1	2	3	4	5	6	7
6	8	9	10	11	12	13	14
7	15	16	17	18	19	20	21
8	22	23	24	25	26	27	28

März 2021							
Nr.	Mo	Di	Mi	Do	Fr	Sa	So
9	1	2	3	4	5	6	7
10	8	9	10	11	12	13	14
11	15	16	17	18	19	20	21
12	22	23	24	25	26	27	28
13	29	30	31				345



shutdown



Beam operation