

# ARES Operation Meeting

## Summary of week 3

**Willi Kuropka**, on behalf of the ARES shift crew

# Summary

## Week 2

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

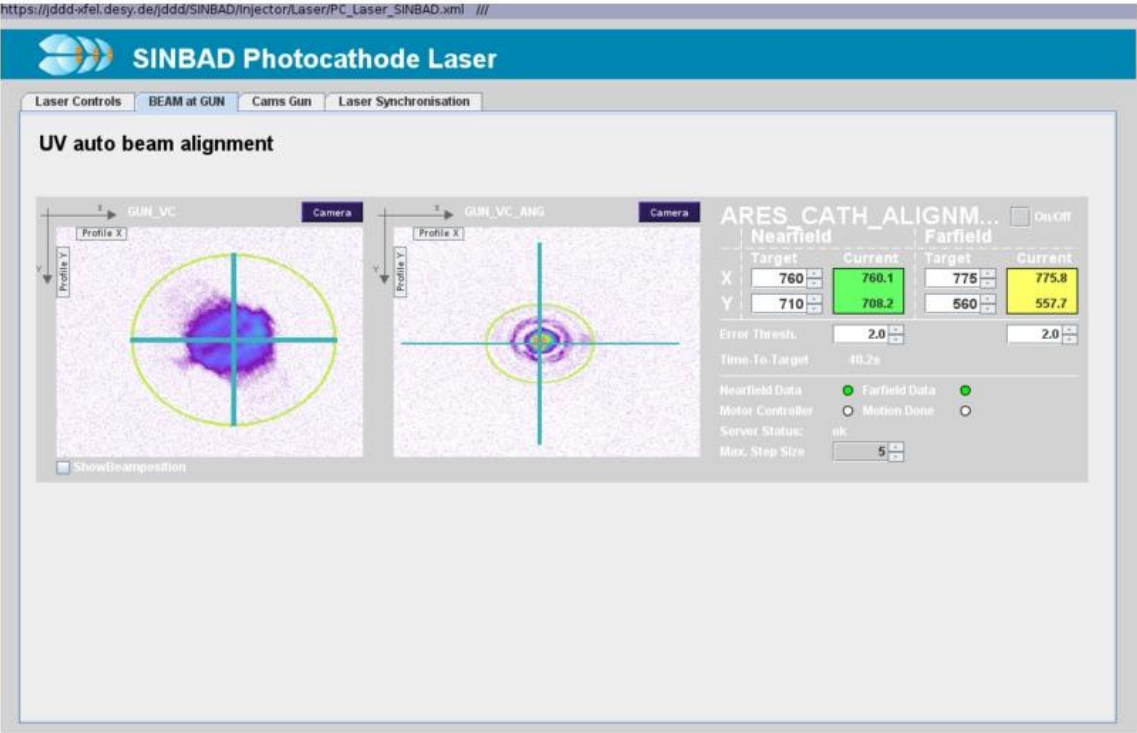
# Summary

## Week 3

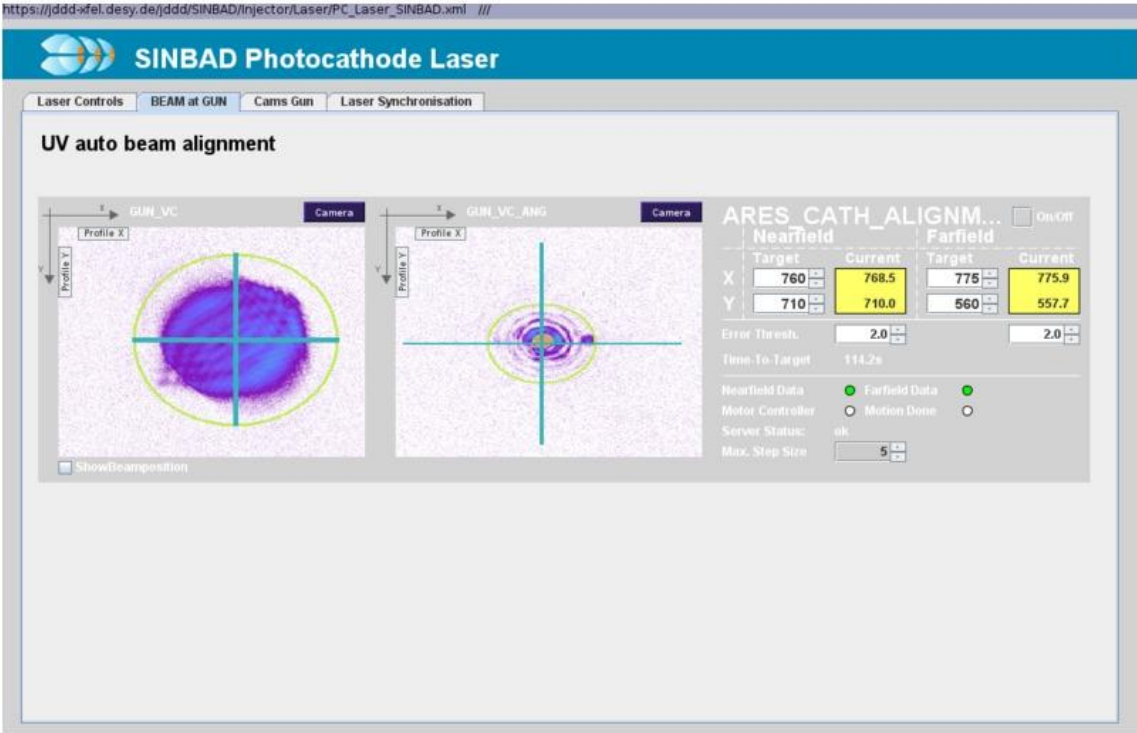
	Monday 18 <sup>th</sup> January	Tuesday 19 <sup>th</sup> December	Wed. 20 <sup>th</sup> December	Thursday 21 <sup>st</sup> December	Friday 22 <sup>nd</sup> December
<b>Achievements/Overview</b>	<ul style="list-style-type: none"> <li>• Cathode laser investigation (secondary pulse)</li> <li>• Alignment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

# New cathode laser apertures

500um

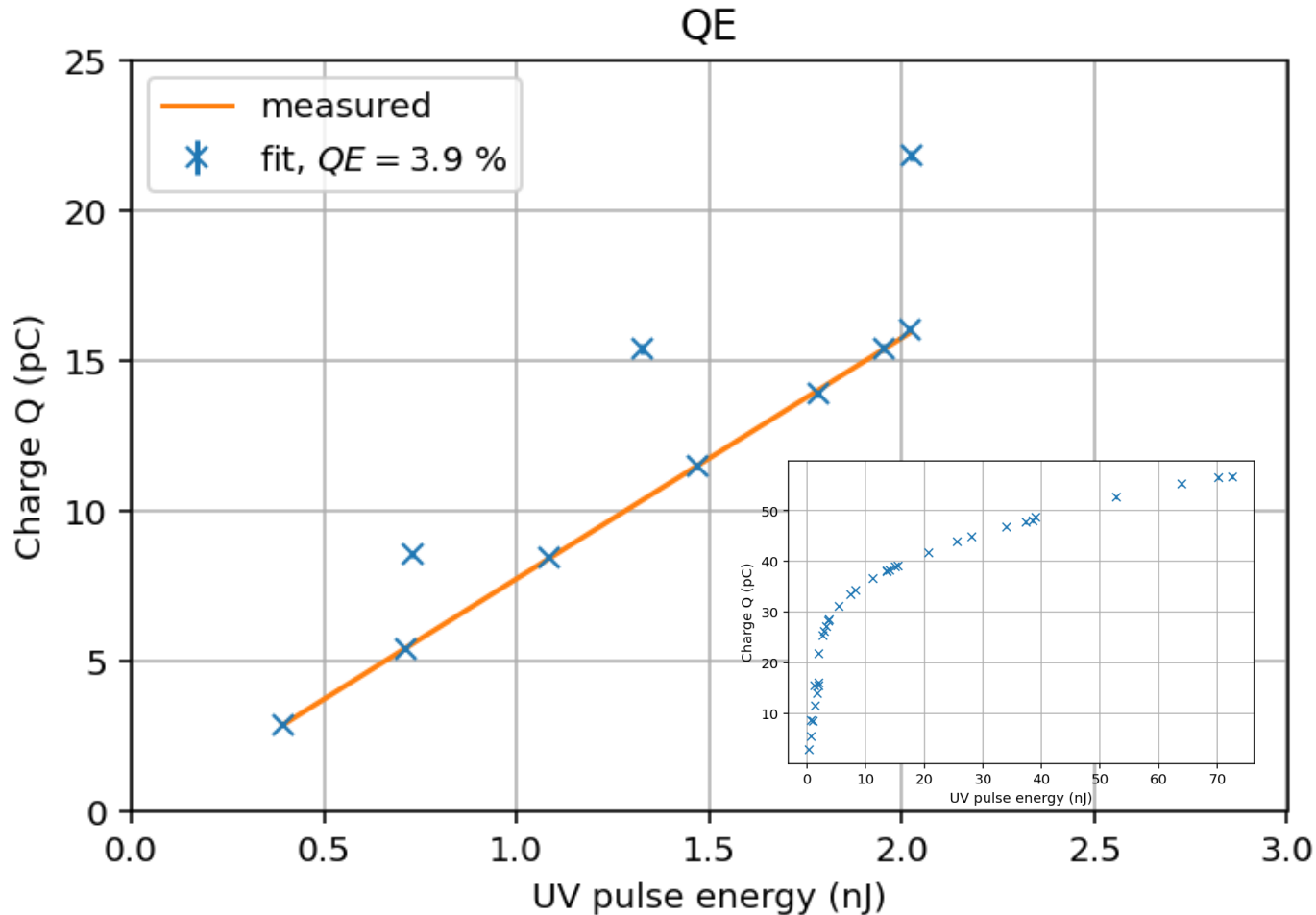


800um



# QE measurement

Measurement from 2021.01.15



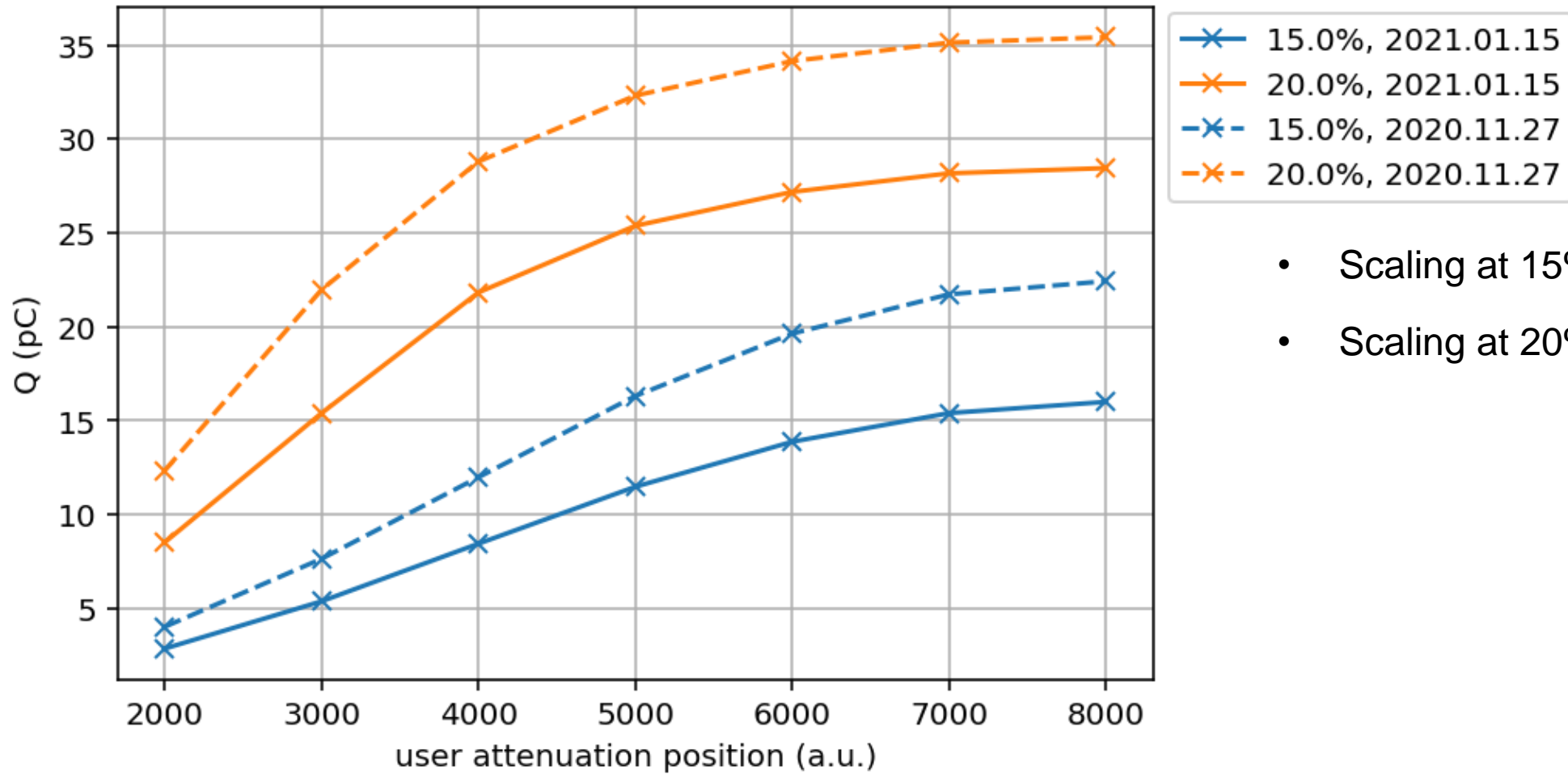
Issues:

- 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)

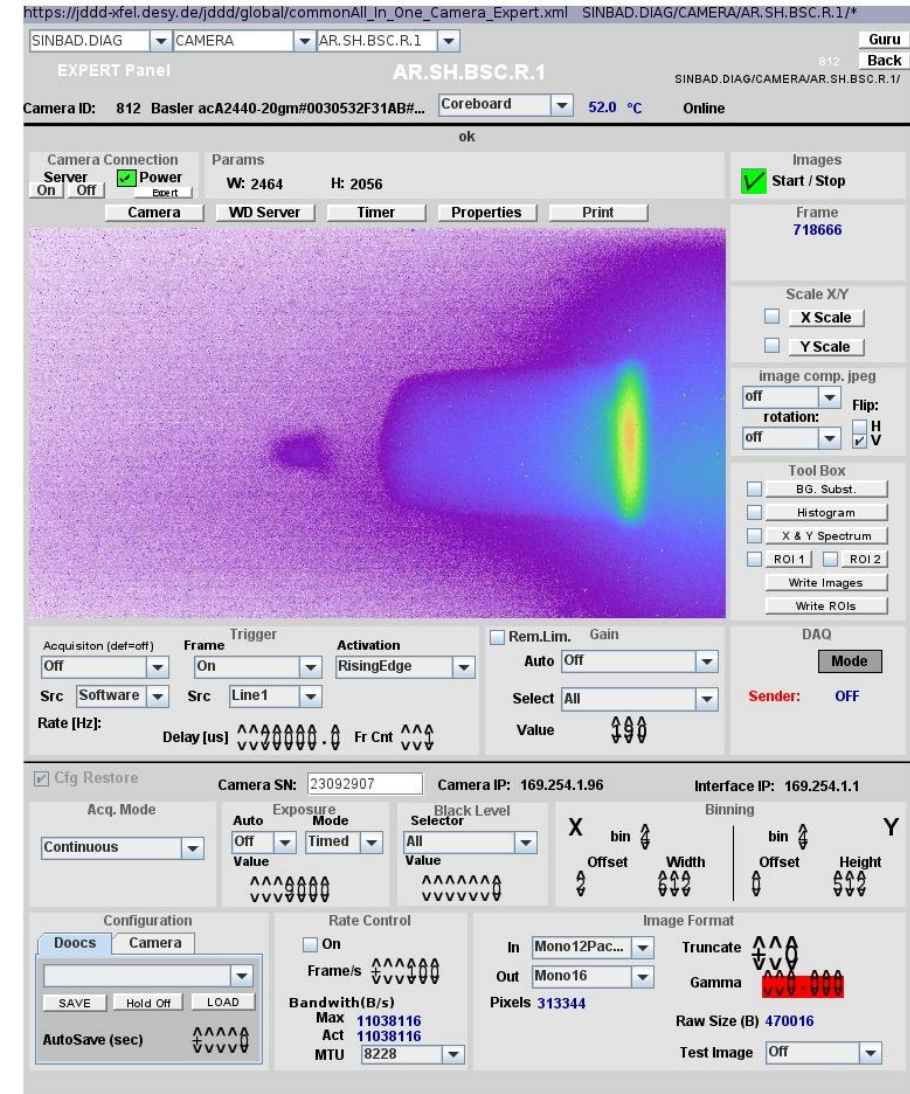
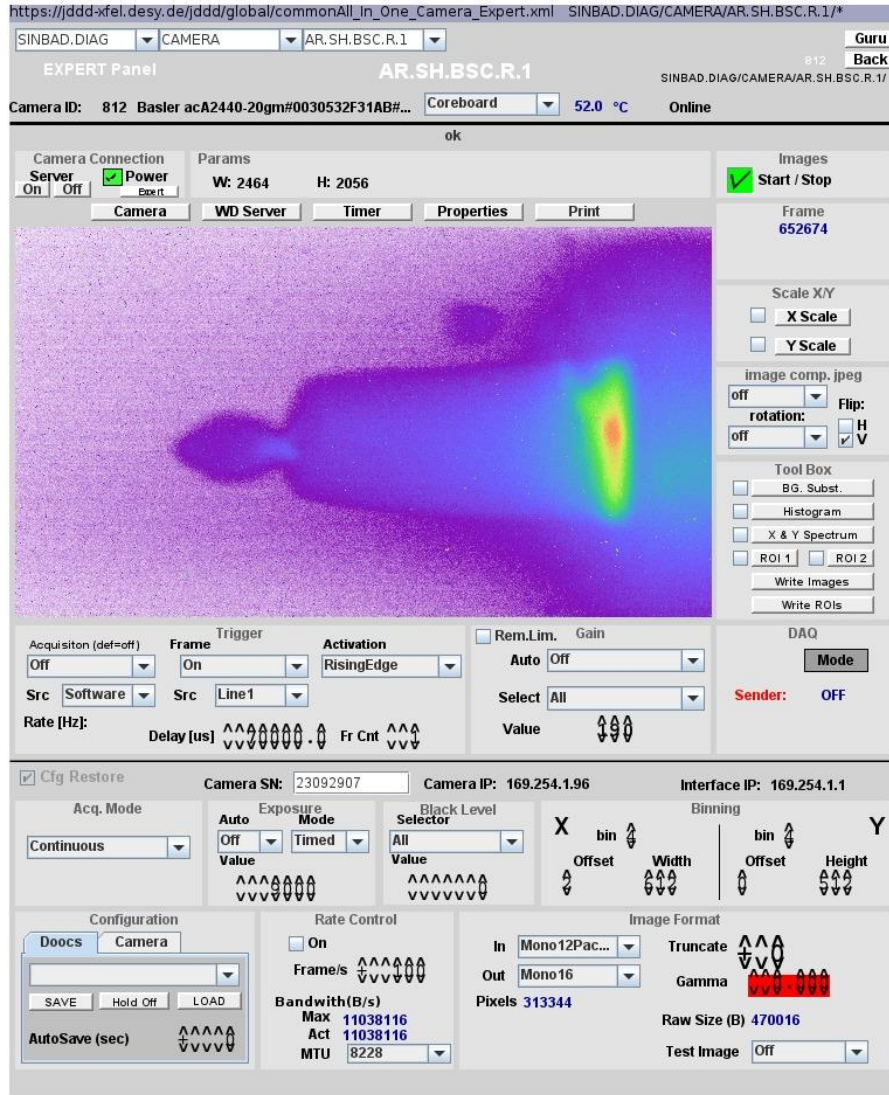
# Comparison to last QE measurement



- Scaling at 15%: (71 +- 0.4)%
- Scaling at 20%: (76 +- 4.8)%

# Secondary beam

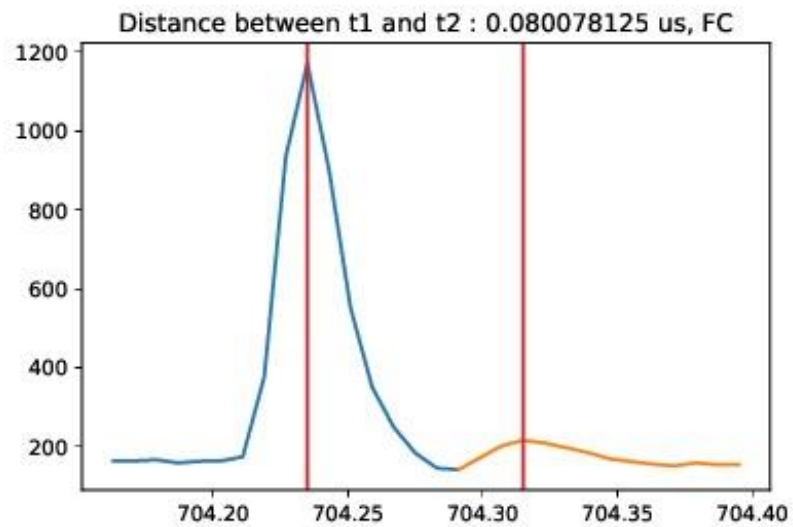
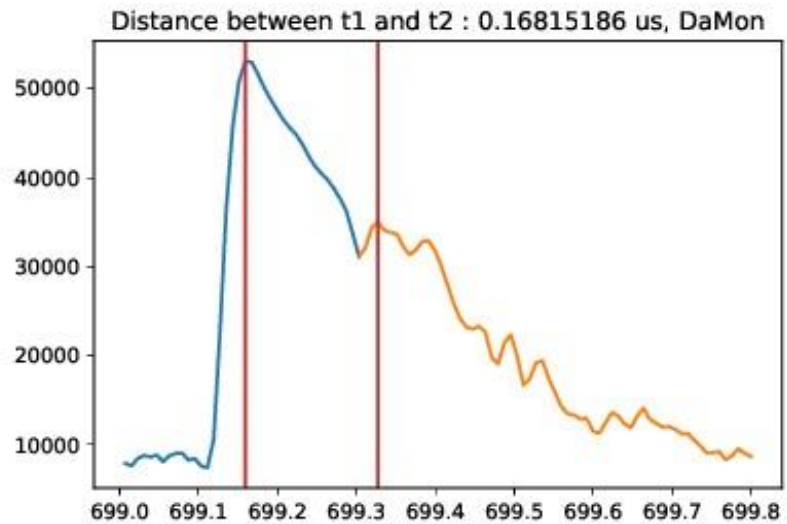
After spectrometer dipole, for different laser attenuator settings



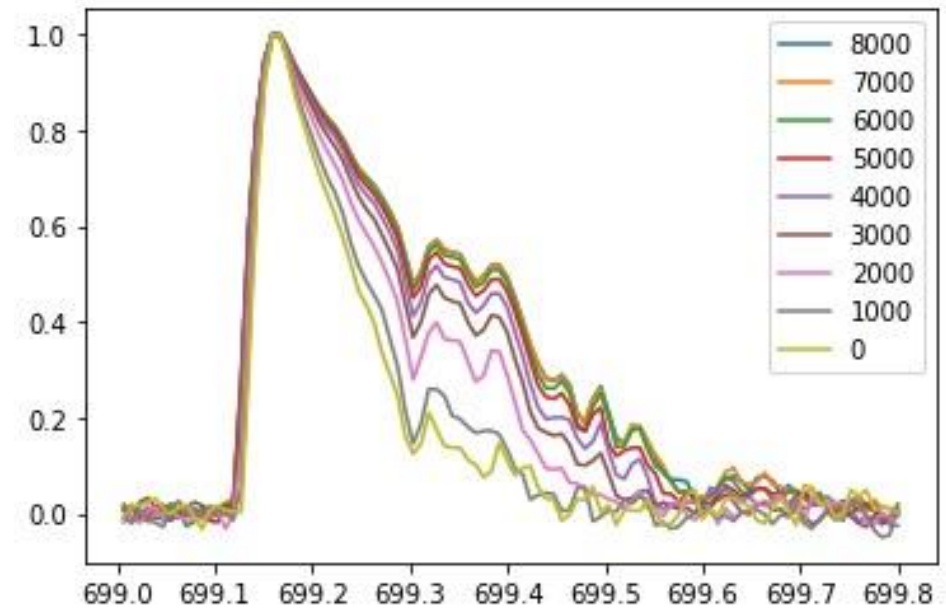


# Secondary beam

## On Faraday cup an DaMon



DaMon signal over laser att. position



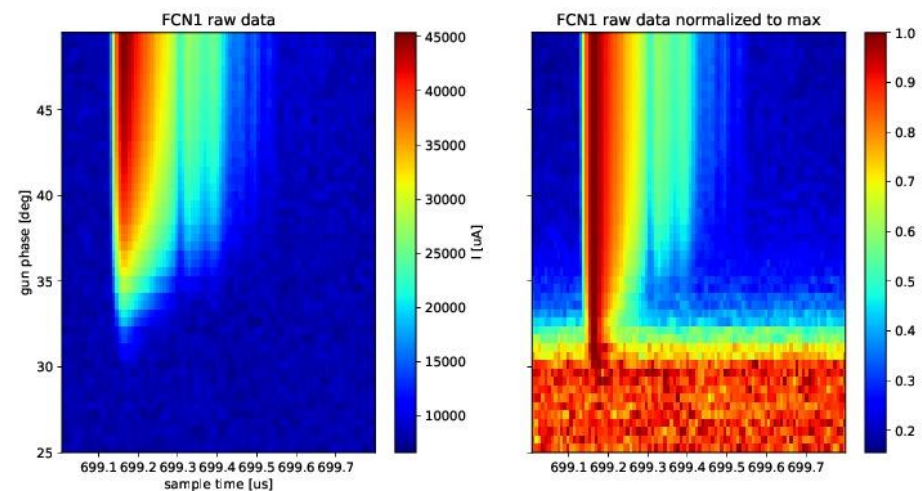
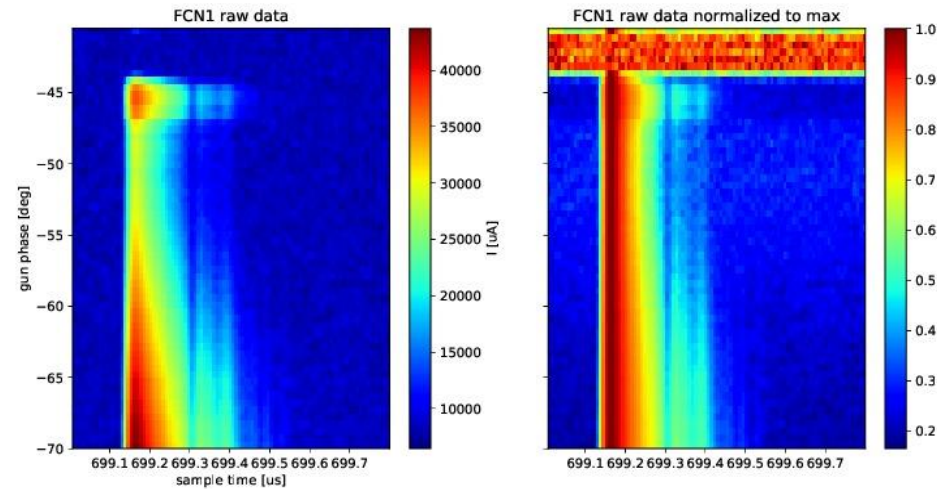
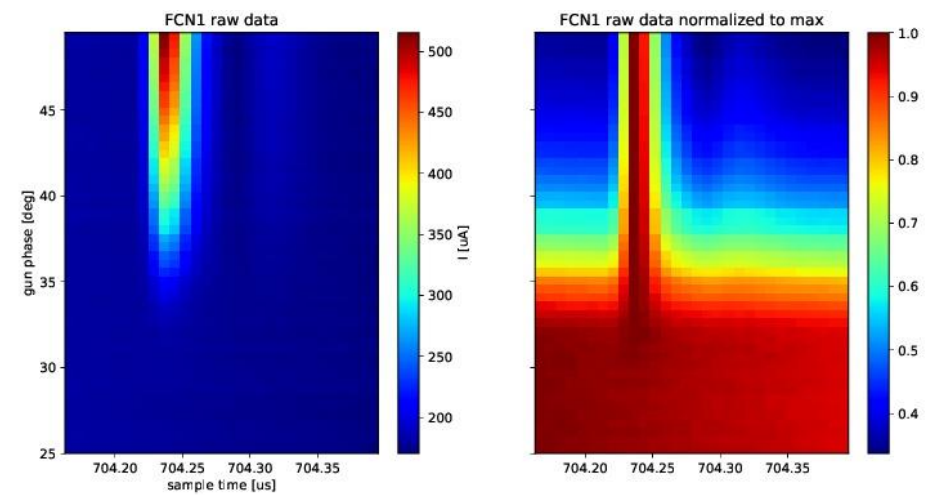
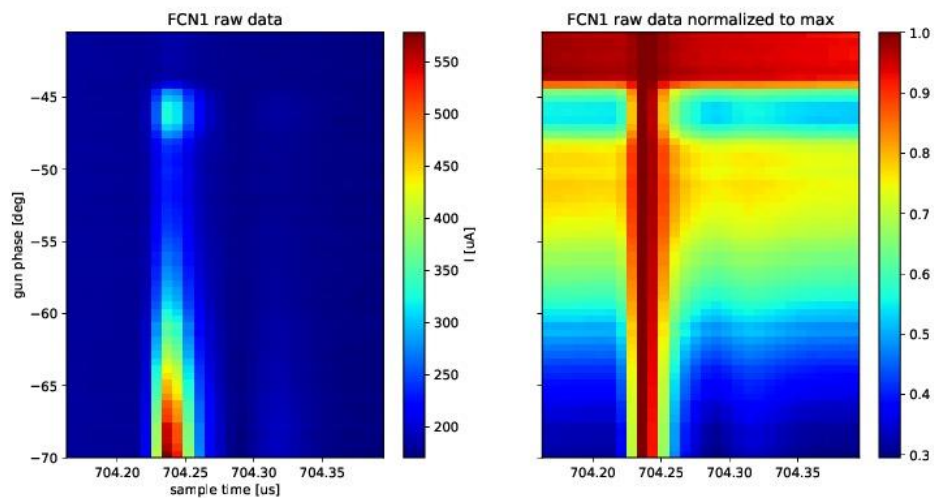


# Secondary beam

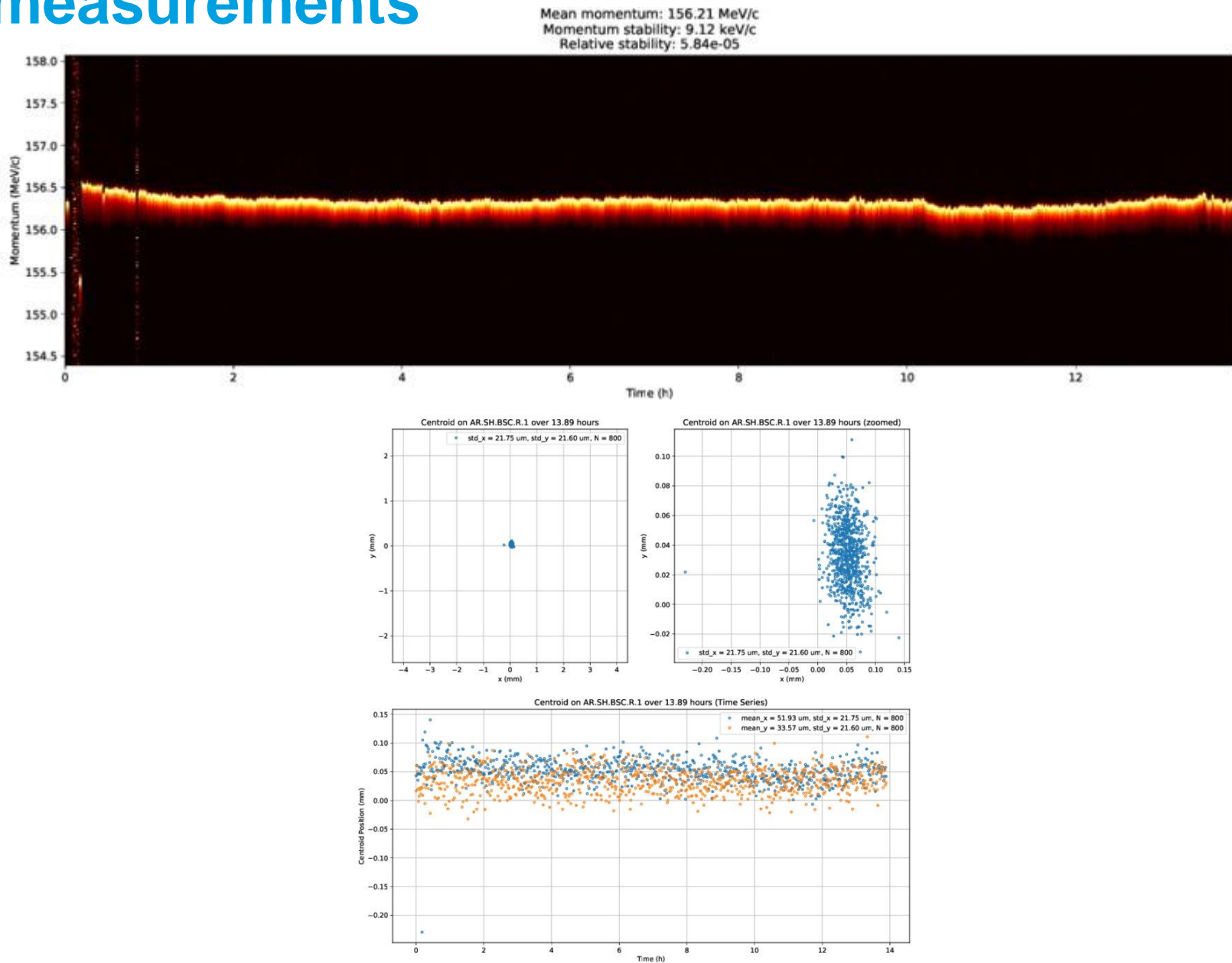
## gun phase scan

FC1

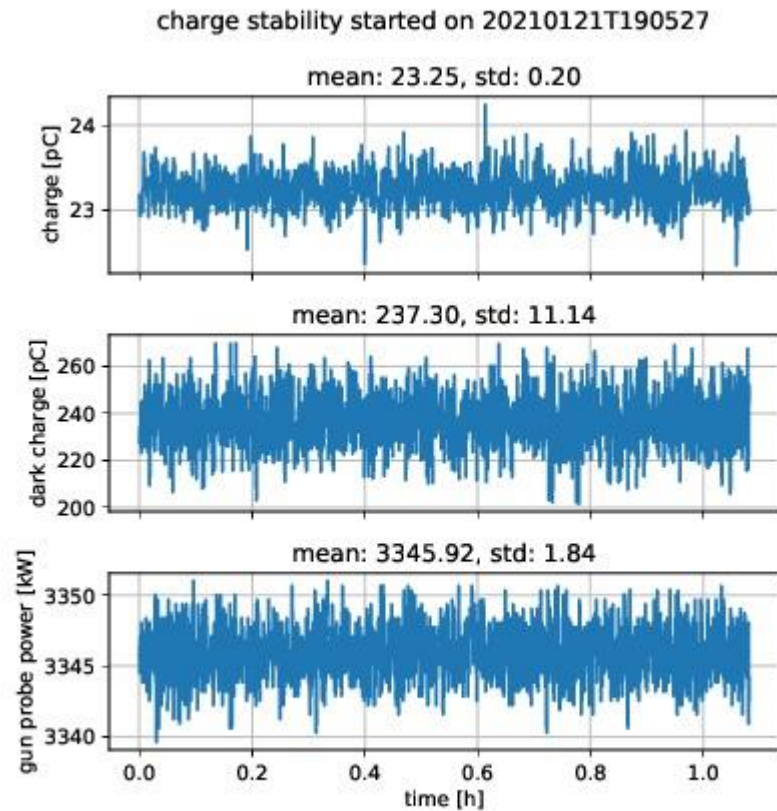
DaMon



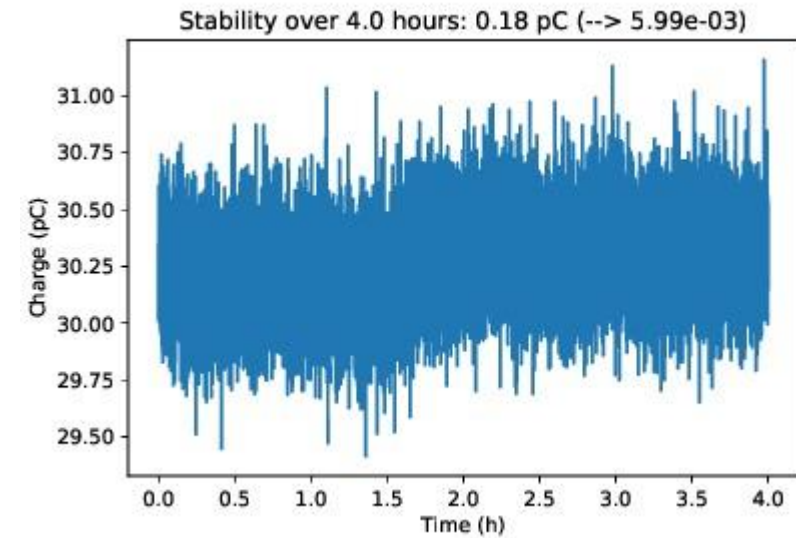
# Stability measurements



# 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					<u>1</u>	2	3
1	4	5	<u>6</u>	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				



shutdown



Beam operation