

ARES Operation Meeting

Summary of week 26 / 2022

Frank Mayet, on behalf of the ARES crew

Summary of week 26

Achievements

Difficulties

Notes

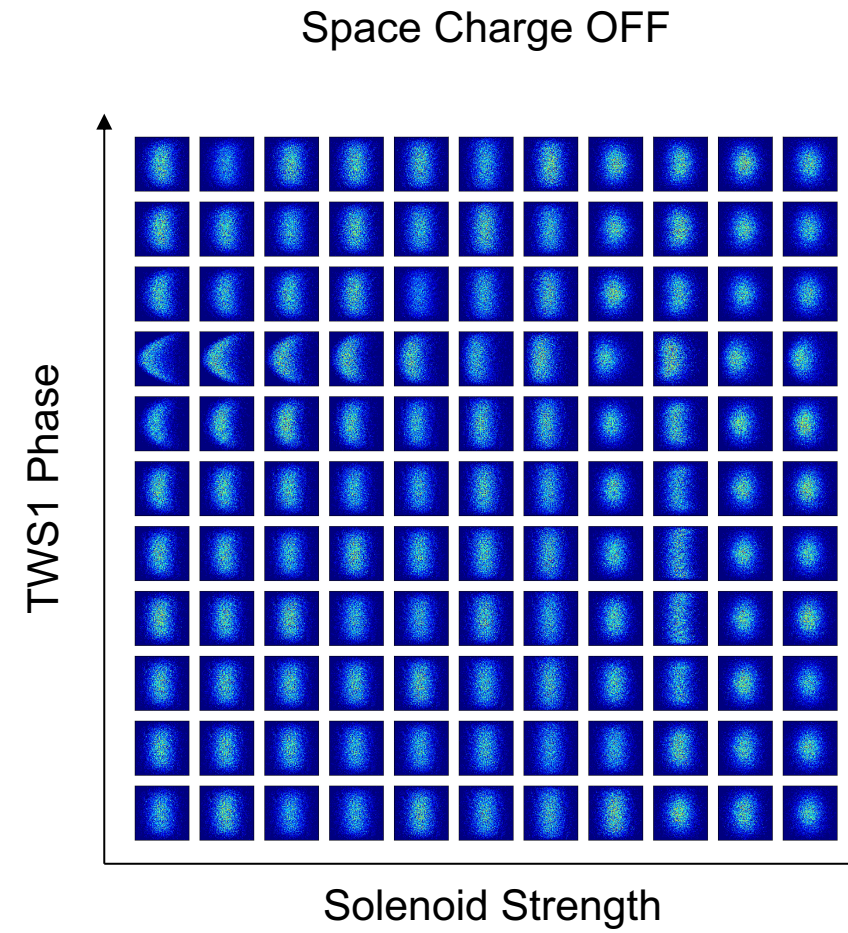
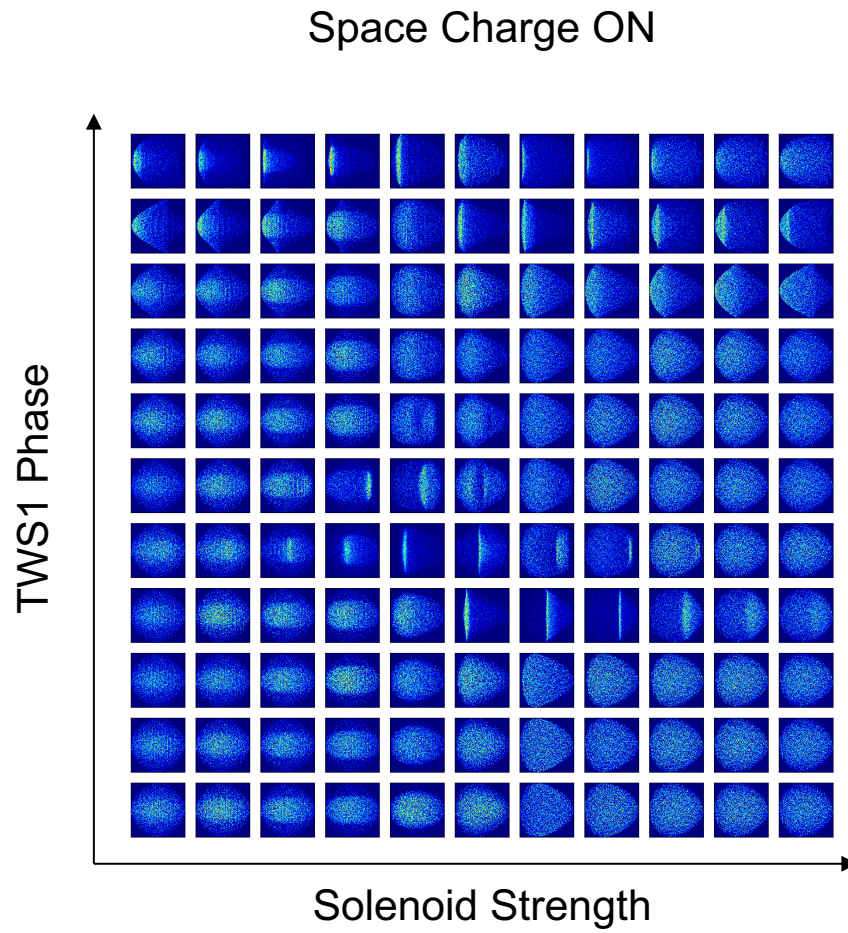
Mon. 27 th June	Tue. 28 th June	Wed. 29 th June	Thu. 30 th June	Fri. 1 st July	Sat. 2 nd July	Sun. 3 rd July
- Work on A/C in the laser lab → Finished - Work on BC PSU - Work on PDE PSU remote control	- Re-start of ARES (3x on-crest) - Work on data acquisition script for recording the full HE Spec energy spectra - MR.R3 calibrated by Artem - Momentum spectrum stability measurement over-night	- Modification of data acquisition scripts for quad BBA, which were supposed to be used last weekend → Fully automated now - Automated BBA quad scans for EA and MR (sans MQZM6)	- Autonomous accelerator studies - Momentum stability measurements with TWS2 off over night	- Bunch duration measurements - Position stability on LI.R1 over the weekend		Position stability measurement finished – beam still on LI.R1 (<i>as expected from ARES by now 🤖</i>)
NO OPERATION						



Double Peak Spectrum

$z=45\text{m}$

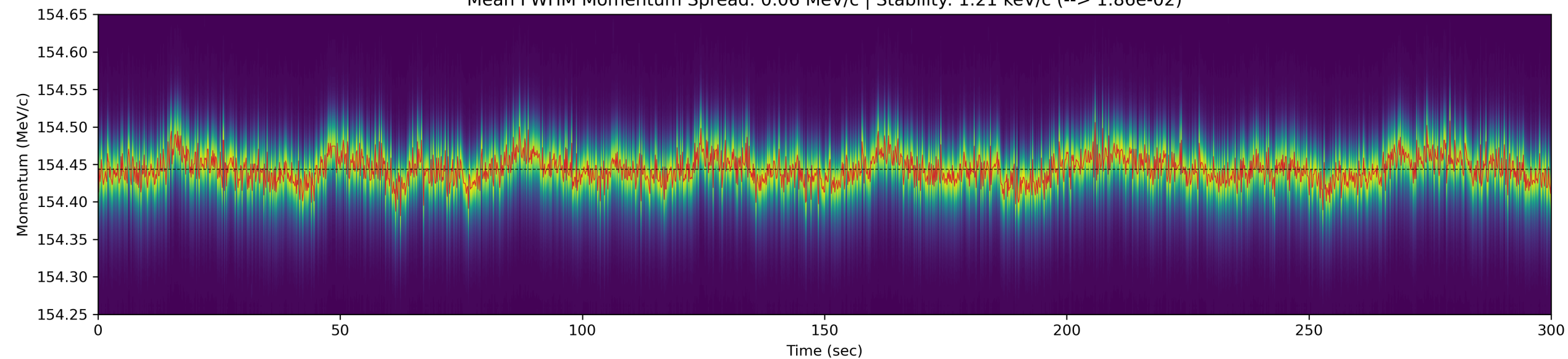
ASTRA; 10k macroparticles



Momentum Spectrum Stability

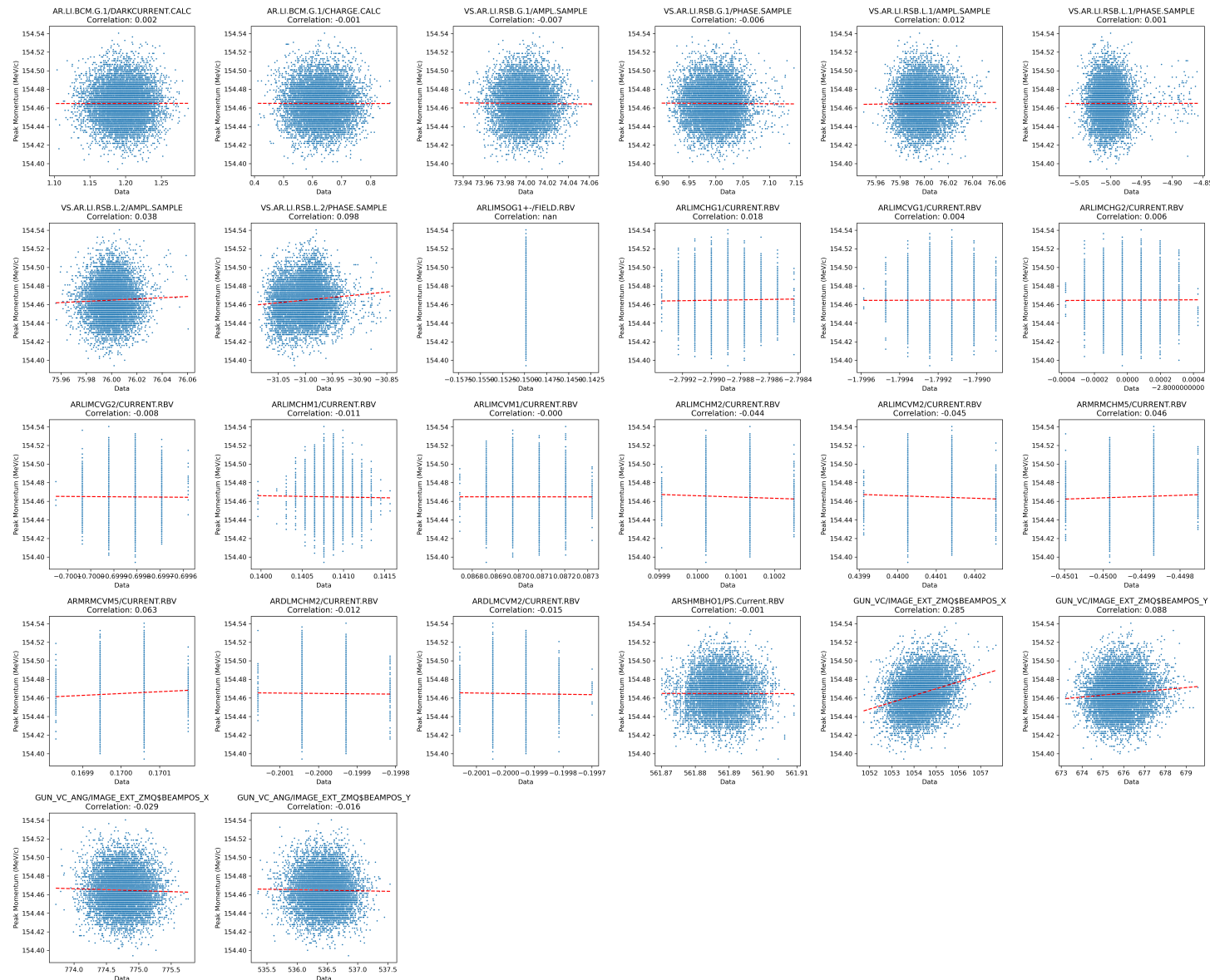
Example

Mean Peak Momentum: 154.44 MeV/c | Stability: 17.41 keV/c (--> 1.13×10^{-4})
Mean FWHM Momentum Spread: 0.06 MeV/c | Stability: 1.21 keV/c (--> 1.86×10^{-2})



Momentum Spectrum Stability

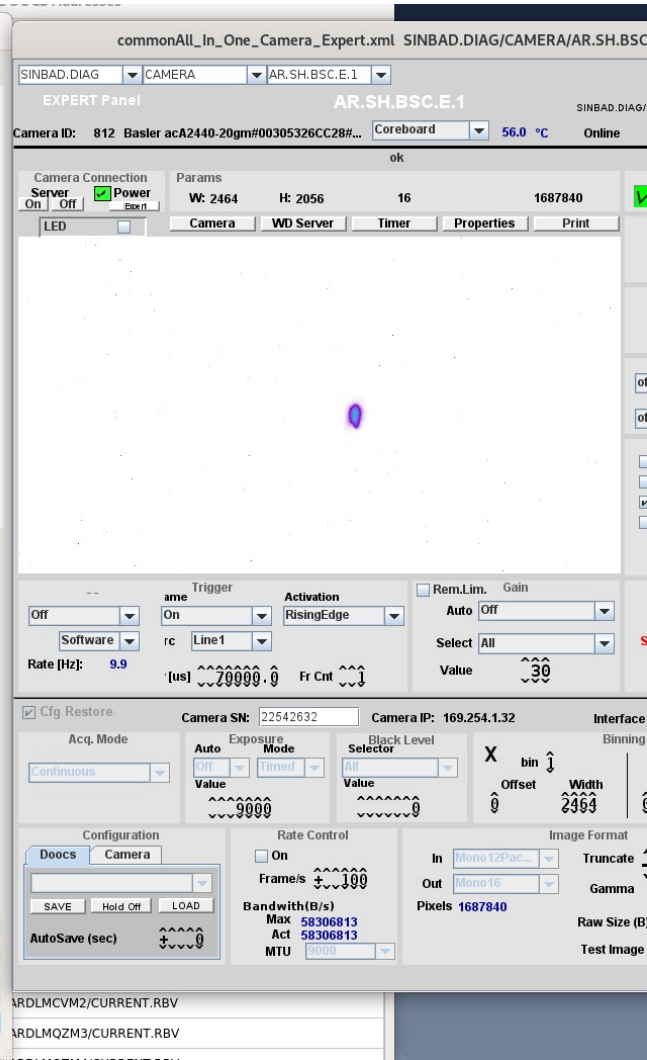
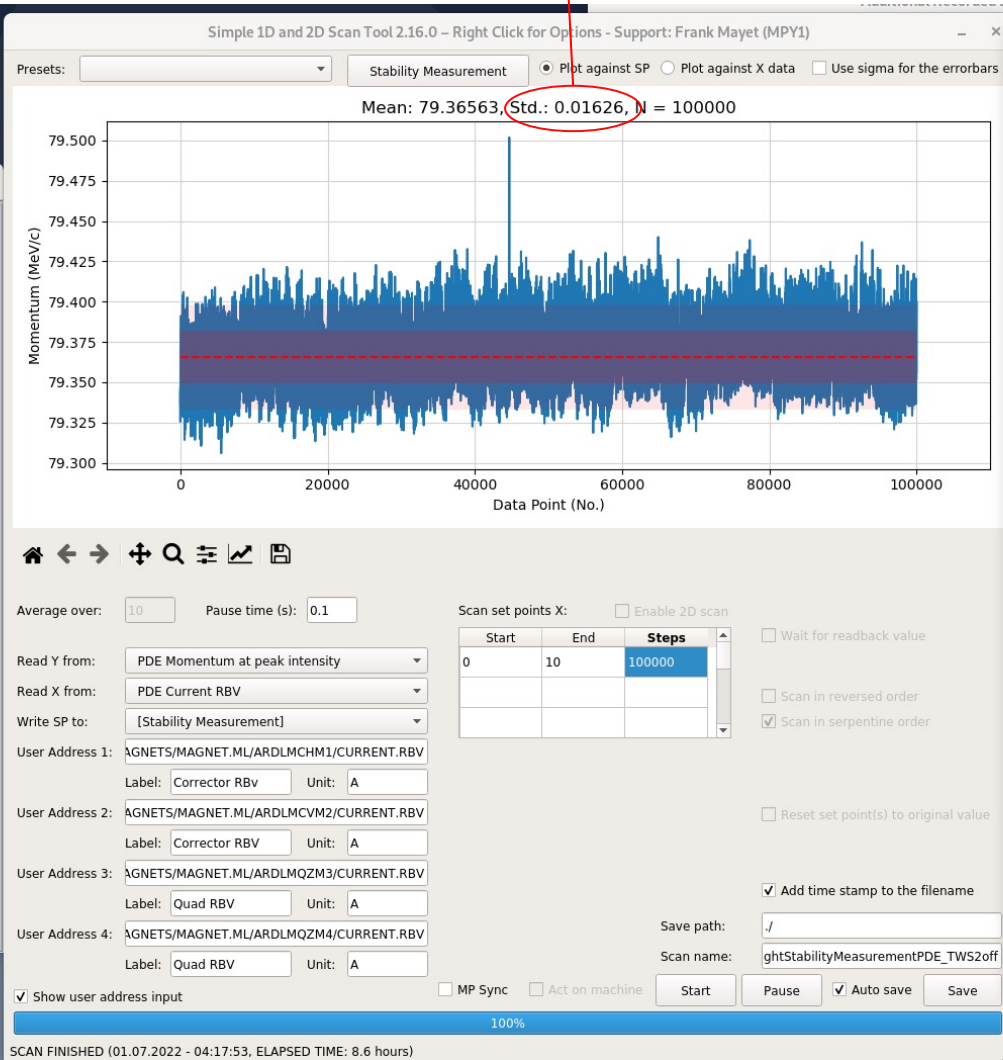
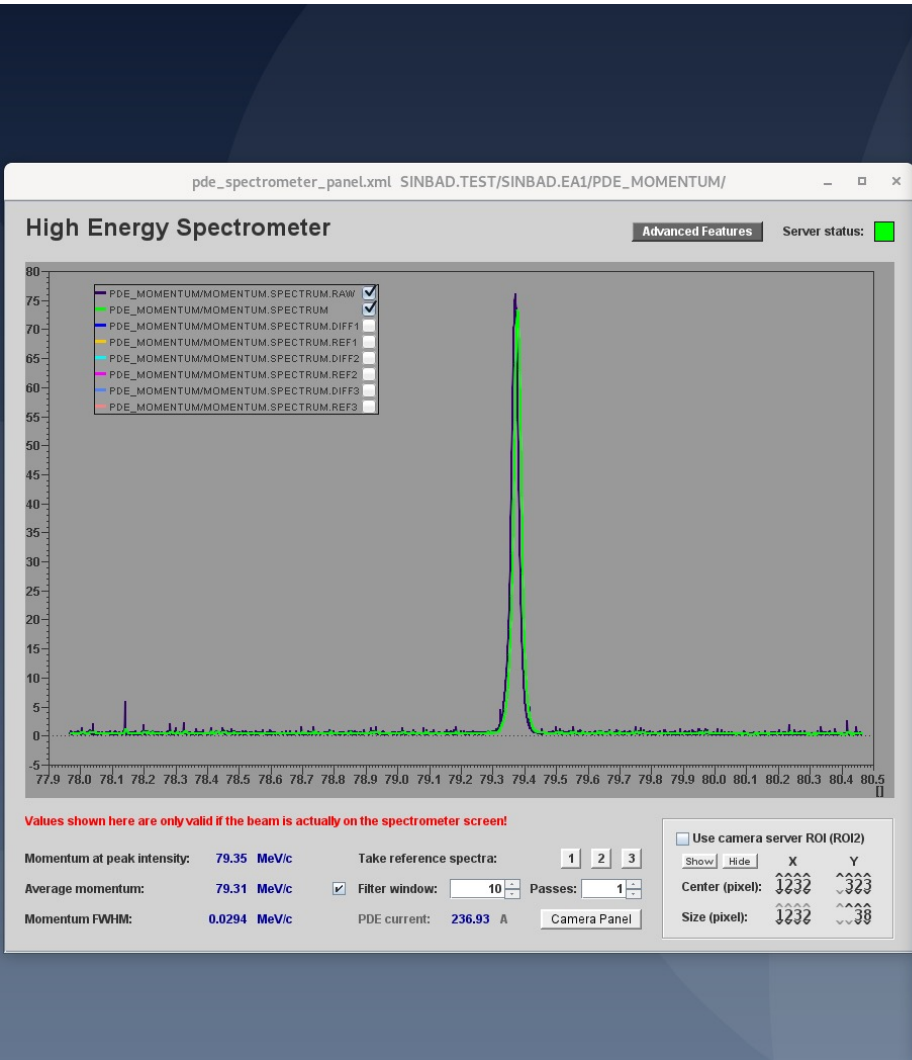
Correlations



Momentum Stability

TWS2 OFF

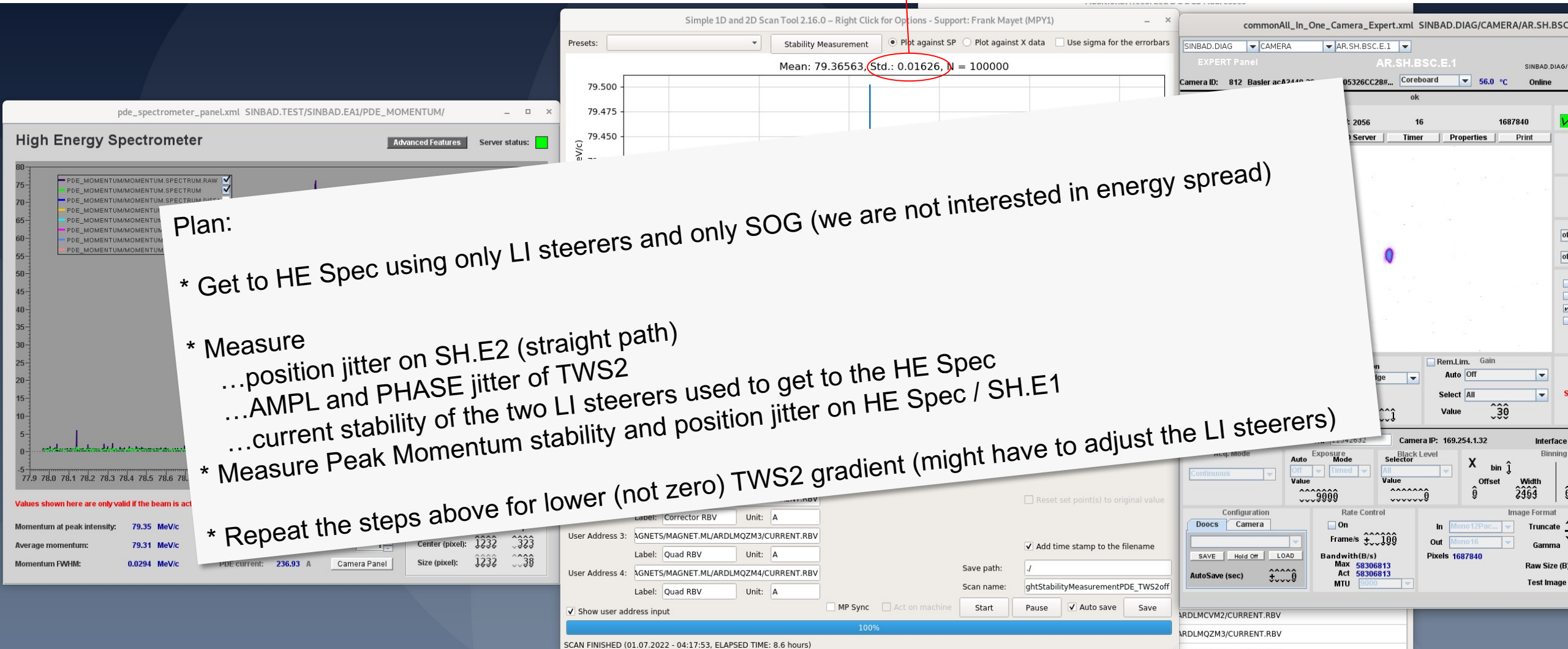
Absolute stability is very similar to what we measure at 155 MeV; would have expected a factor of 2 smaller number, if the stability is dominated by position jitter (momentum window is a percentage of the mean momentum)



Momentum Stability

TWS2 OFF

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EA Quadrupole BBA

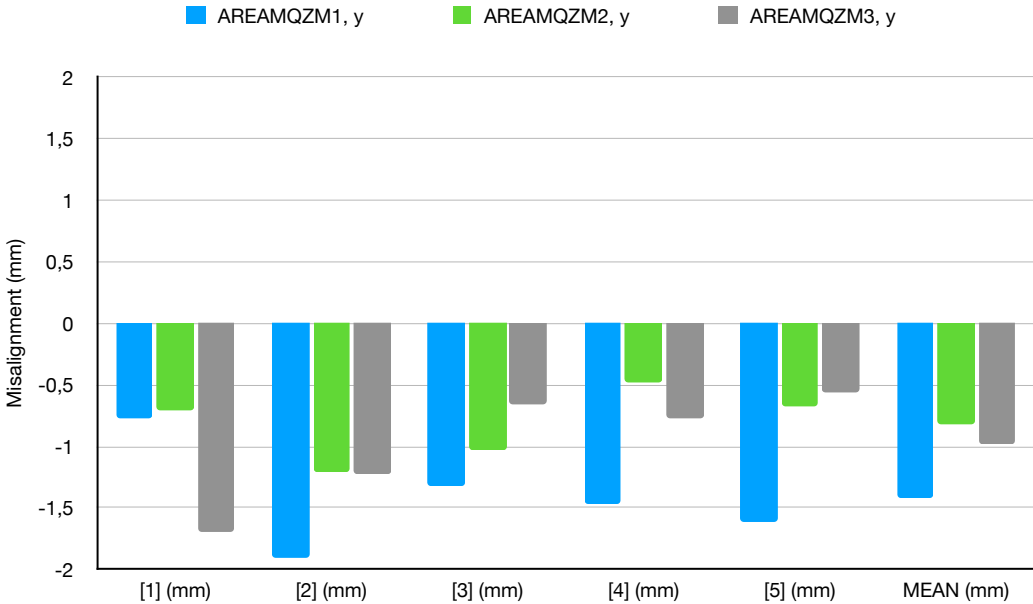
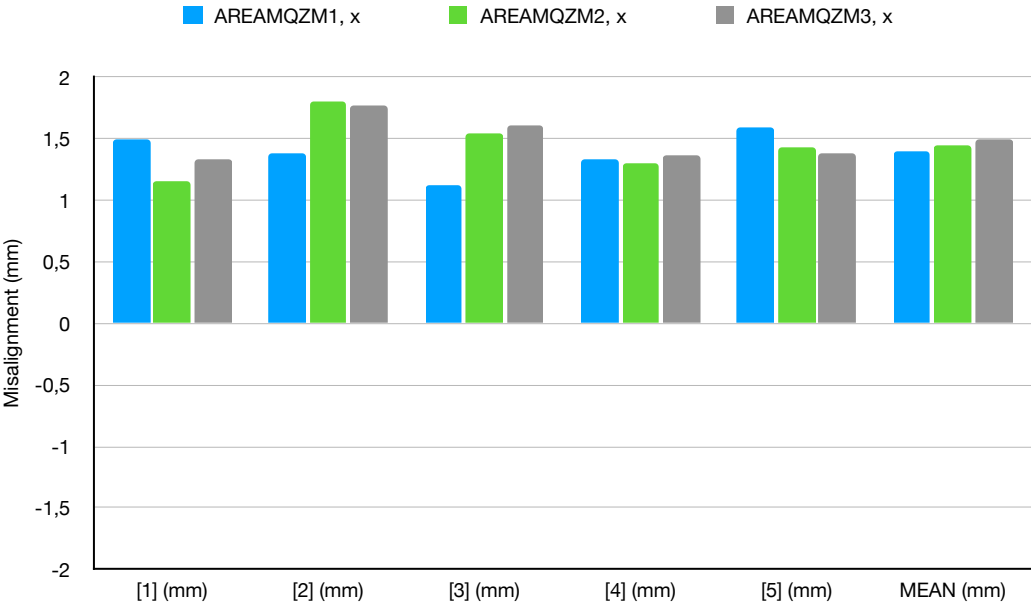
Multiple measurement – Different techniques

BBA EA Quadrupoles

	[1] (mm)	[2] (mm)	[3] (mm)	[4] (mm)	[5] (mm)	MEAN (mm)	ERROR (mm)
AREAMQZM1, x	1,504	1,39	1,13	1,341	1,597	1,392	0,079
AREAMQZM1, y	-0,769	-1,90	-1,33	-1,470	-1,62	-1,418	0,188
AREAMQZM2, x	1,156	1,80	1,54	1,310	1,43	1,447	0,109
AREAMQZM2, y	-0,704	-1,21	-1,03	-0,487	-0,68	-0,822	0,130
AREAMQZM3, x	1,341	1,77	1,61	1,368	1,39	1,496	0,084
AREAMQZM3, y	-1,696	-1,22	-0,65	-0,769	-0,558	-0,979	0,212

Measurements (all performed with silver orbit 750fC for bunch compressor commissioning):

- [1] Oliver 2022-06-09
- [2] Hannes 2022-06-09 (same conditions as [1])
- [3] Frank 2022-06-29
- [4] Oliver 2022-06-30
- [5] Jan 2022-06-30 (same conditions as [4])



Plan

Week 27

- **Monday**
 - Tunnel open – Laser table stabilization measures
- **Tuesday**
 - Momentum and position stability check
 - Emittance measurement using the micro-wirescanner (EA chamber)
 - Preparations for a 4D tomography measurement
- **Wednesday**
 - 4d tomography (supervised)
- **Thursday**
 - Autonomous accelerator?
- **Friday**
 - tbd

Schedule

Week 27 (Run coordinator: –)

Date	Shift Leader	F	S	N
04.07.	-			
05.07.	Frank			
06.07.	Willi			
07.07.	Hannes			
08.07.	Thomas			
09.07.	–			
10.07.	–			

If you want to learn or join the shift: please give the shift leader a call (BKR 2840 / SINBAD Box 2454)