ARES Operation Meeting

Summary of week 09 / 2024

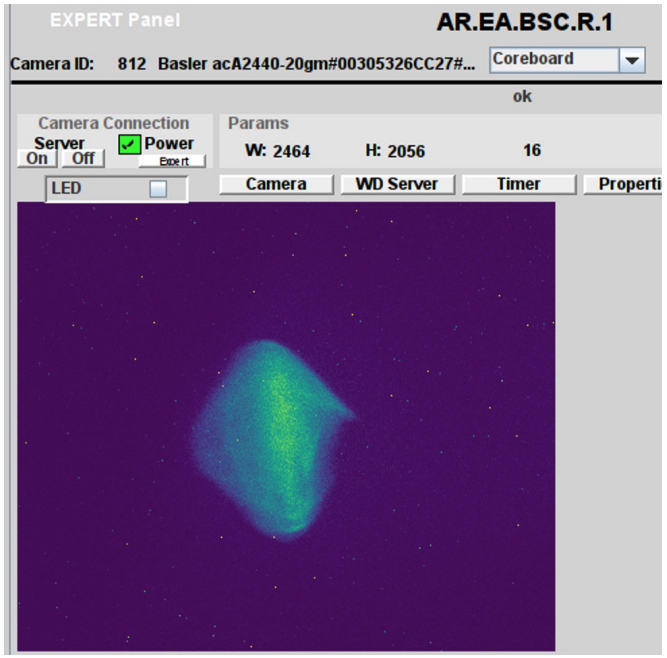
Max Kellermeier, on behalf of the ARES crew

Summary of week 09

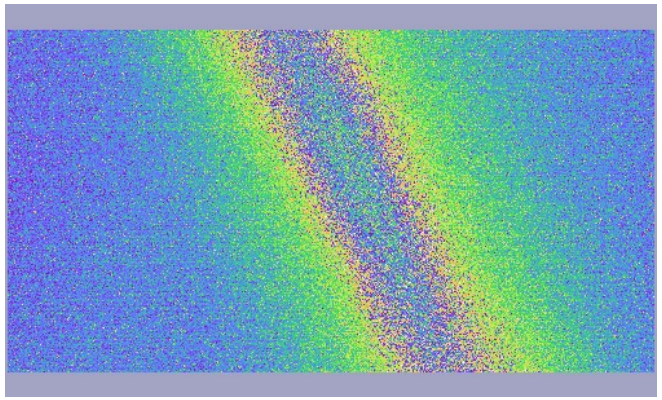
	Mon. 26th Feb	Tue. 27th Feb	Wed. 28th Feb	Thu. 29th Feb	Fri. 1st Mar
Achievements	• On-crest phases reset • JAI cam (timing setup) reinstalled • New working point established (low momentum) • Overnight gun phase stability measurement	• 2D steerer scan for vertical alignment on wakefield tube • Horizontal alignment • Streaking observed on two screens • 2D steerer scan for vertical alignment on different tube (tube 3) overnight	• Horizontal scan and comparison to parking position to determine center of tube • Offset scan for streaked beam data acquisition on MR.R1, MR.R2 and BC.E1 • Beam transport for Momentum measurement and Bunch duration measurement (TDS Modulator faulty)	• After re-established WP: Longitudinal Bunch profile measurement with PolariX • Triple On-crest WP for checking phases • TWAC WP2 set up • Beam focused on EA.A1 • Transport to SH.D1 & PolariX measurement • 2D steerer scan for vert. alignment on two tubes, overnight	• Horizontal alignment on both tubes • Aperture and dielectric thickness scans (low charge) • Offset scan for streaked beam on BC.E1 with tube 1 • Offset scan for streaked beam on BC.E1 with tube 2 • Spectrum measurement with influence of wakefields • PolariX measurement with beam unfocused in EA
Difficulties	• No success in focusing beam on EA.A1 screen	• TWS solenoids cannot be degaussed (no procedure defined)	• TDS modulator not going to trigger mode		
Notes	• *Tunnel open at lunch time* • *LI.R2 & MR.R1 cam back in operation* • *LI.R2 calibrated (MDI)*		• *Tunnel opened at night for TDS modulator inspection*		

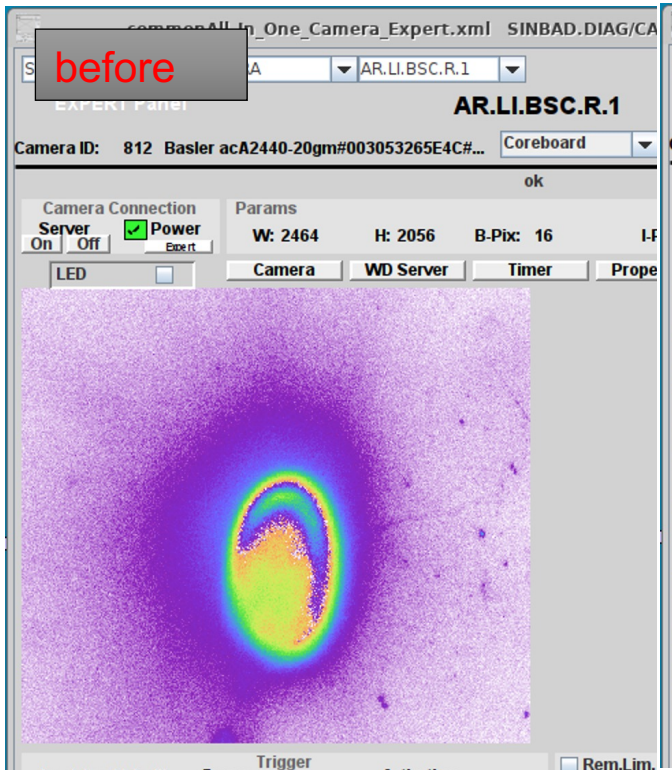
Monday: new working point

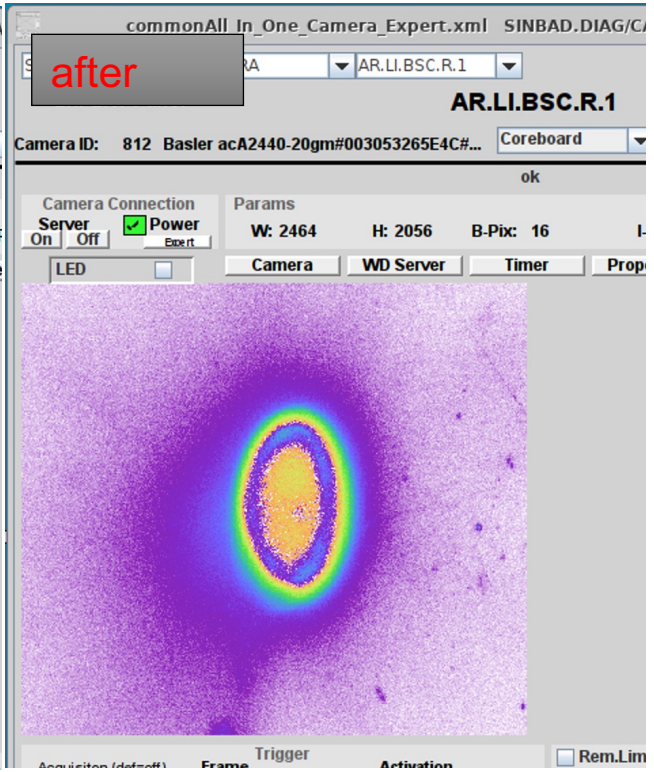
Around 64 MeV



No success in focusing beam on EA.A1



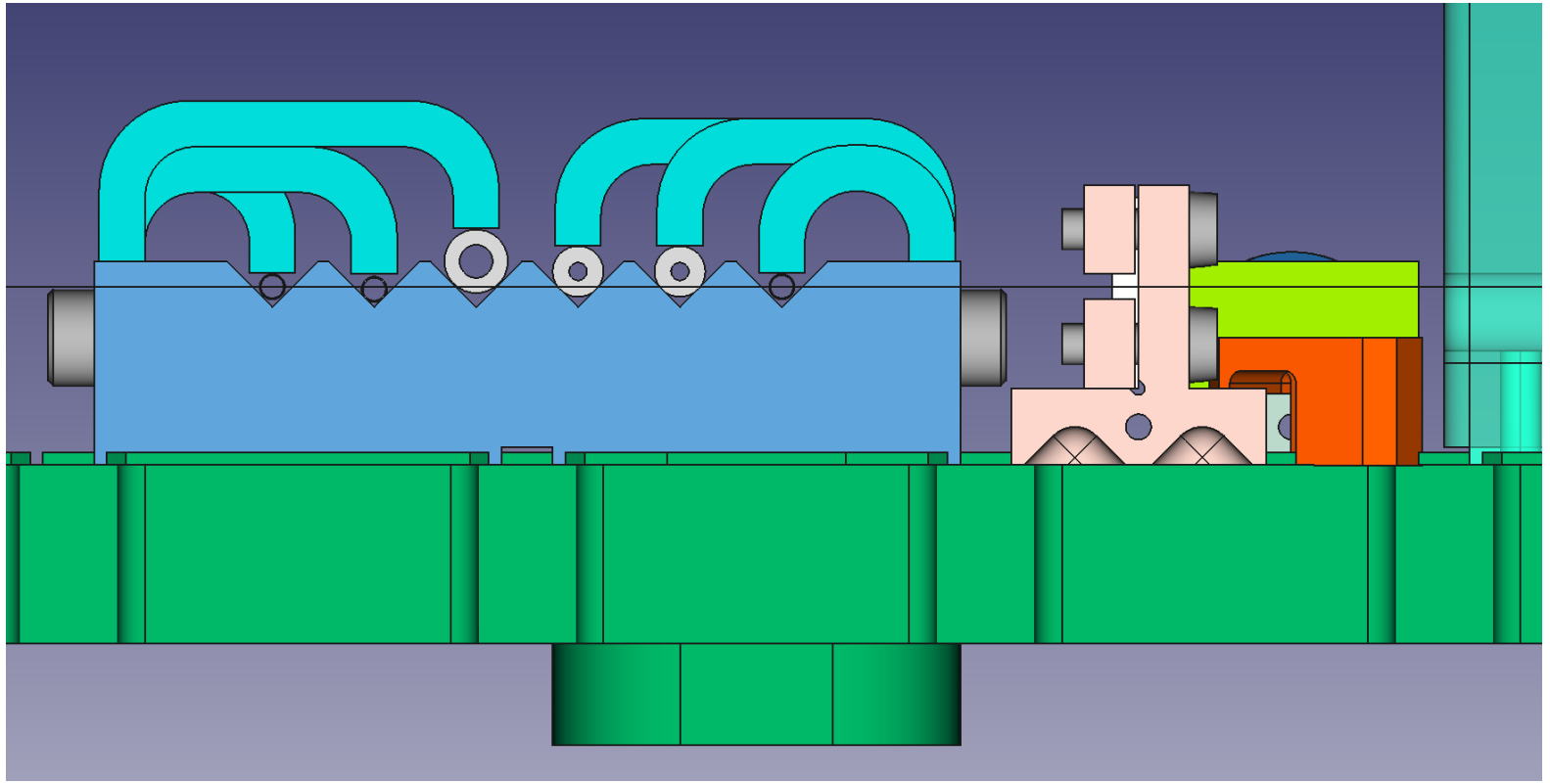




Steering of UV pulse on cathode via Picomotors

Remark: Finding beam on JAI cam

- More challenging now due to clamp on DLA holder
- Vertically more limited. Might see clipped beam if unfocused

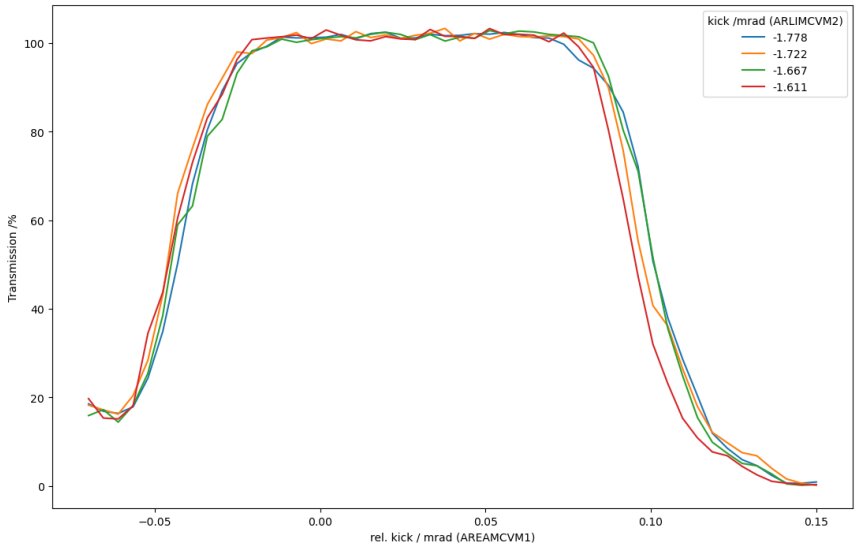


Gun phase stability measurement

The gun reference phase was rather stable (0.2 degree deviation at maximum) but the global gun phase drifted monotonically by around 1 degree. Something (laser timing ?) is making the gun phase drift continuously.

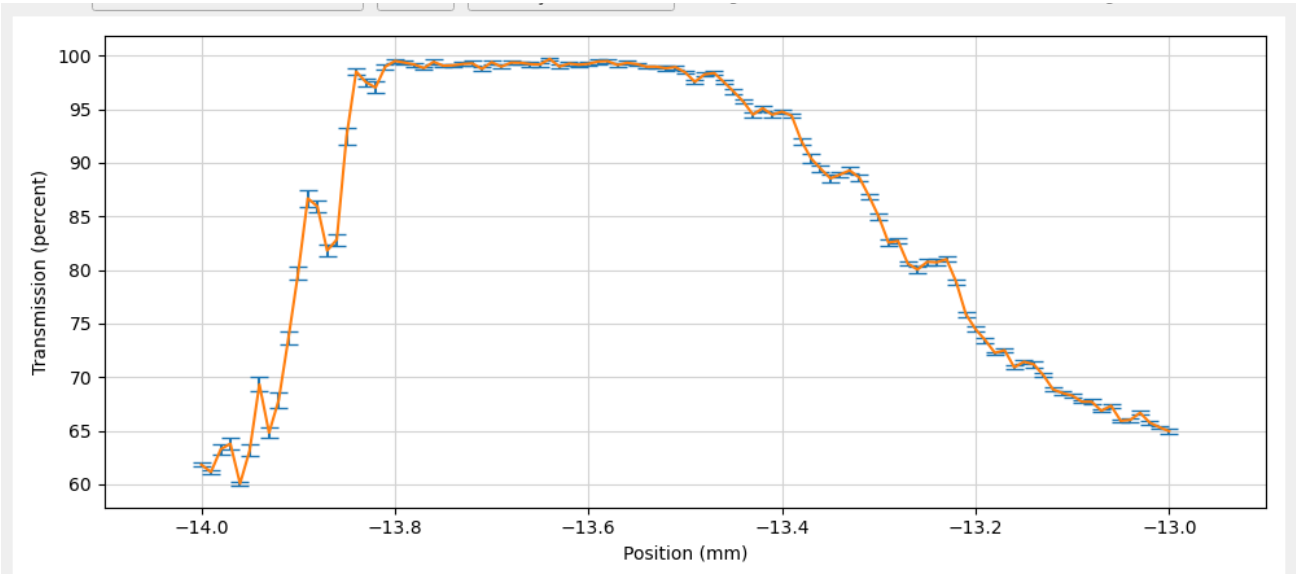
Tuesday: Alignment on tube

- Using established WP
- Beam on EA.A1 too large, beam size estimated
- 2D vertical steerer scan: LI.CVM2 & EA.CVM1, low charge (0.4 pC)
- Horizontal alignment with hexapod



rotation around y-axis

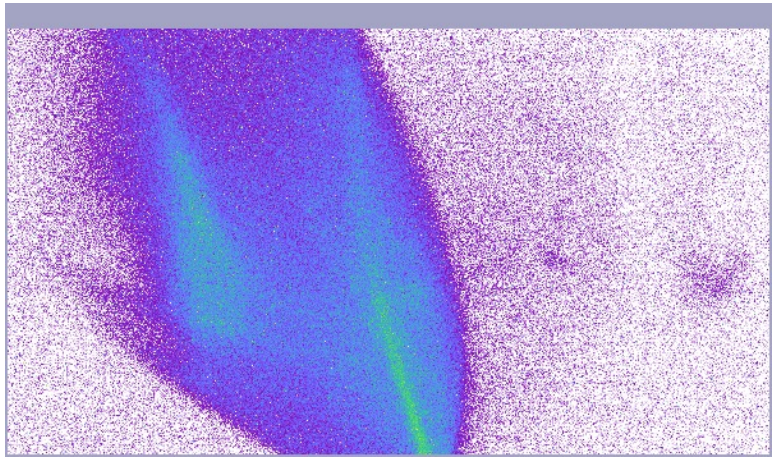
angle /deg	width of plateau /um
0.0	490
-0.05	420
+0.05	340
-0.025	460
+0.025	440
0.0	480



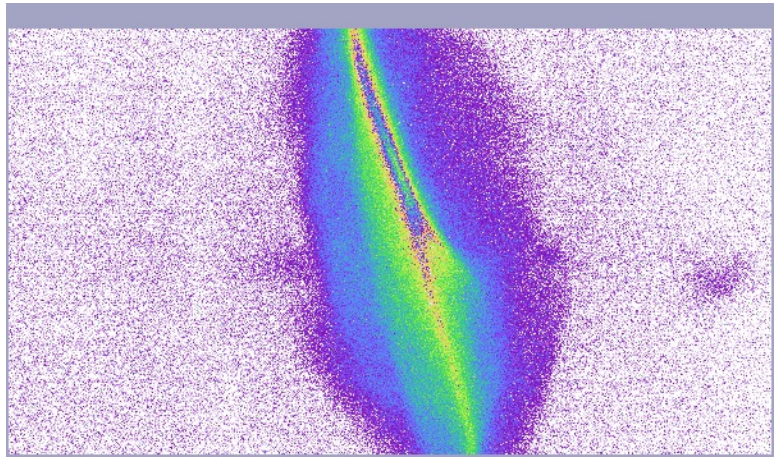
Streaked Beam On MR.R2

(wrong tube)

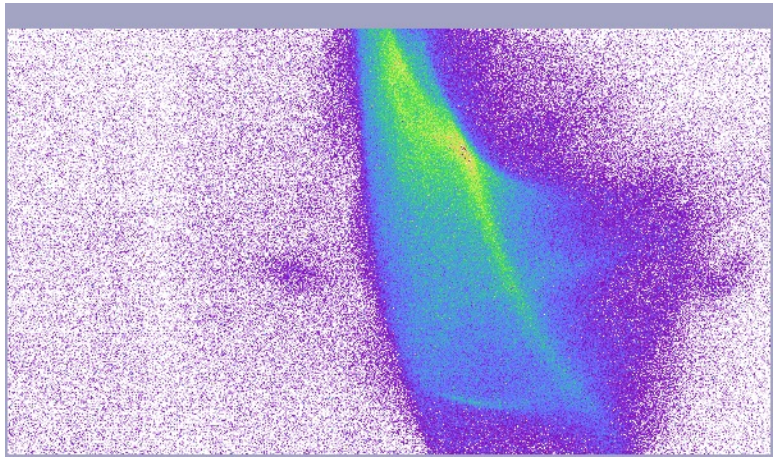
Offset: -0.2mm

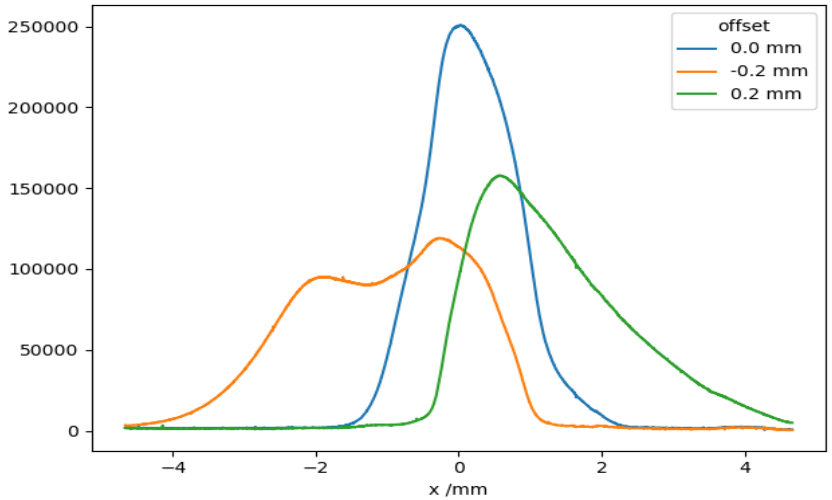


Centered in tube



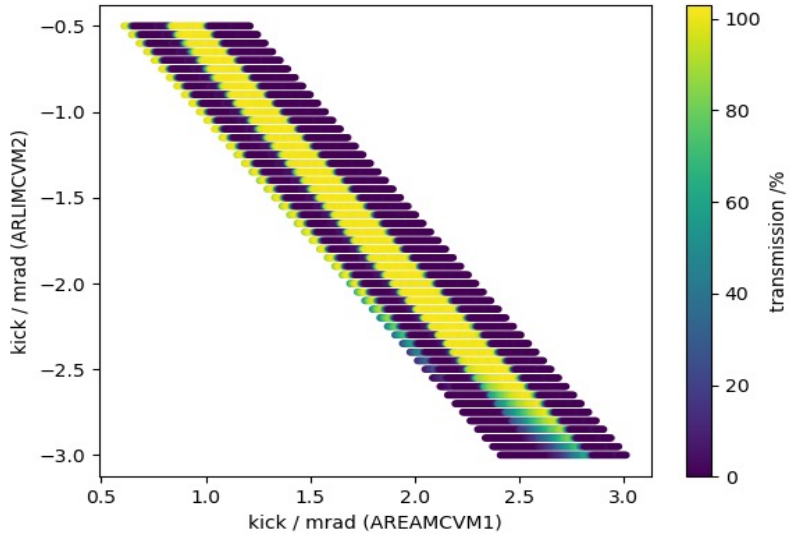
Offset: +0.2mm

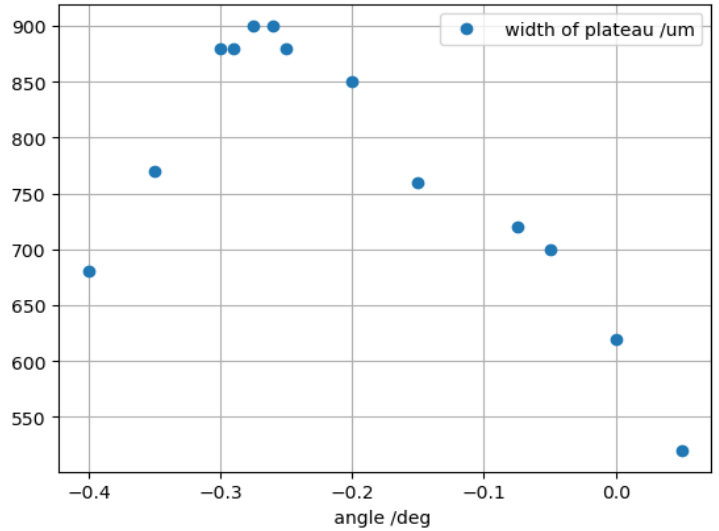




Only 95% transmission

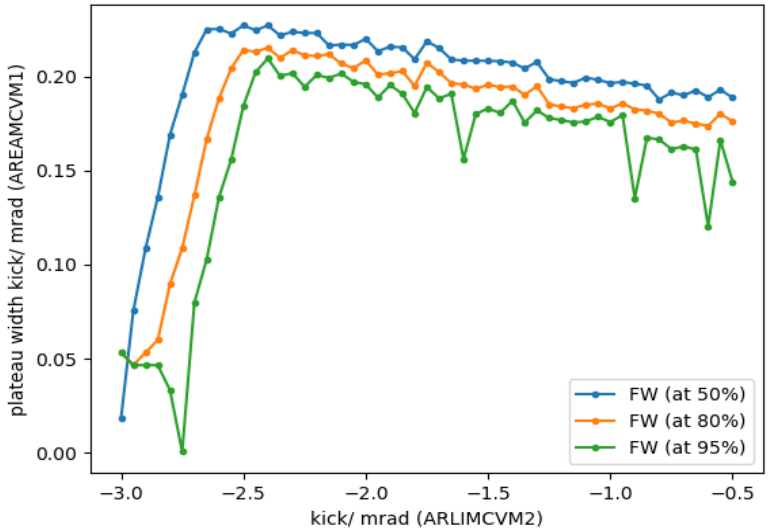
Wednesday



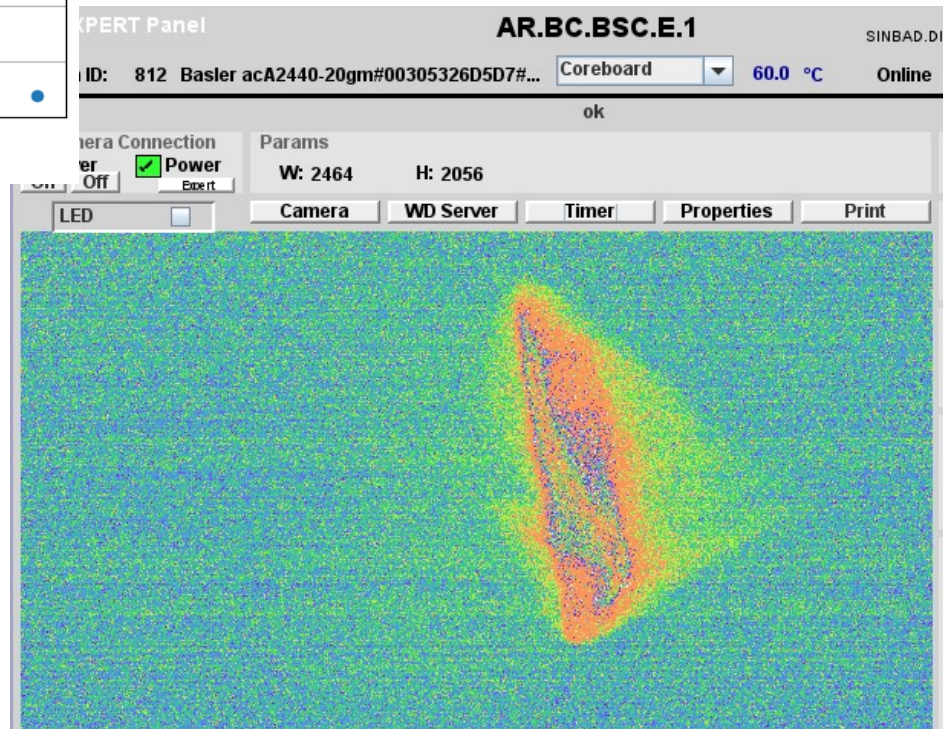


- Three offset scans with this WP

Streaked beam on BC.E1
(no depth of field issue)

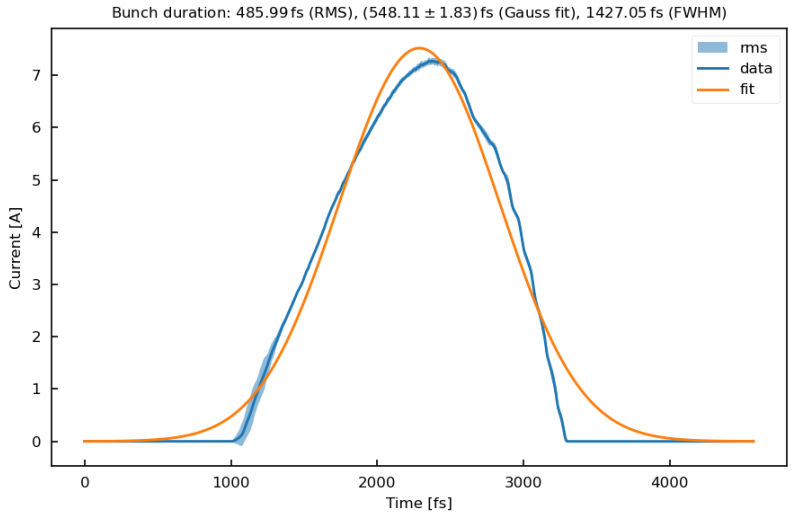


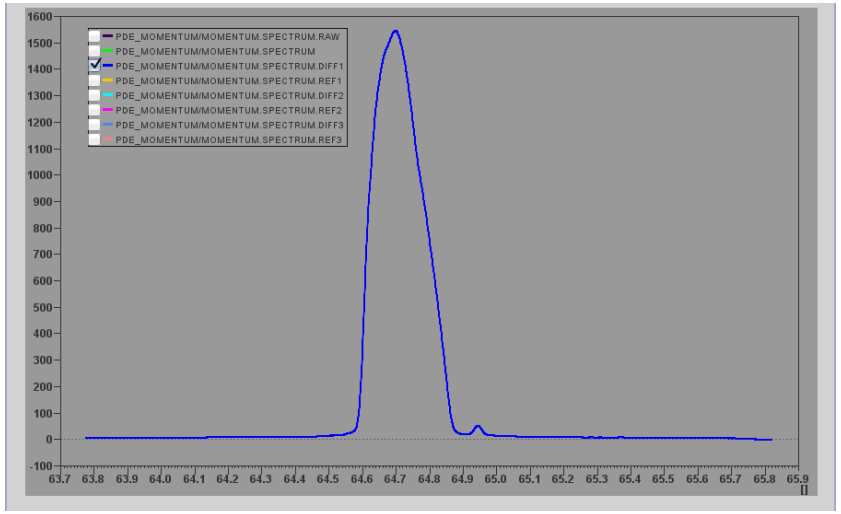
Vertical alignment analysis and horizontal alignment (rotation of hexapod around y-axis)
on intended tube (tube 3)

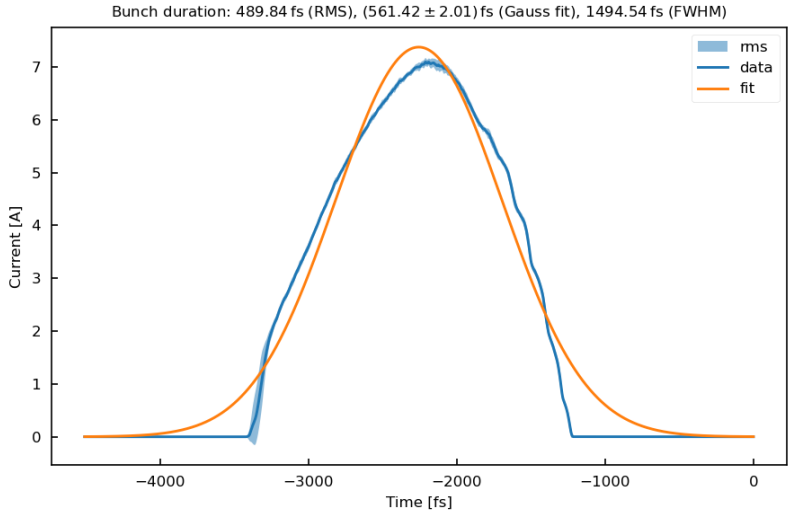


Thursday: First WP

- WP re-established
- PolariX measurement
- WP2 set up

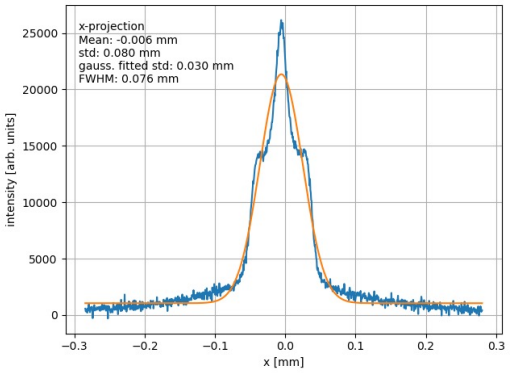


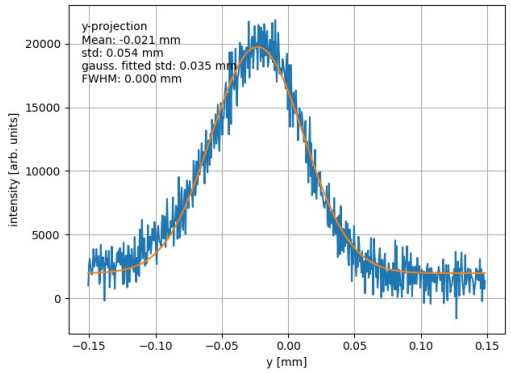


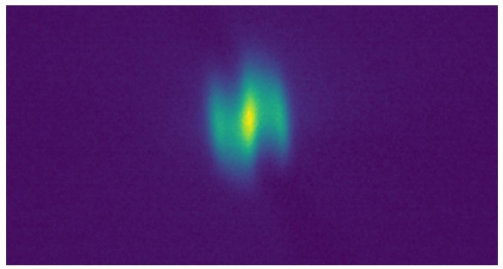


Setting up WP2

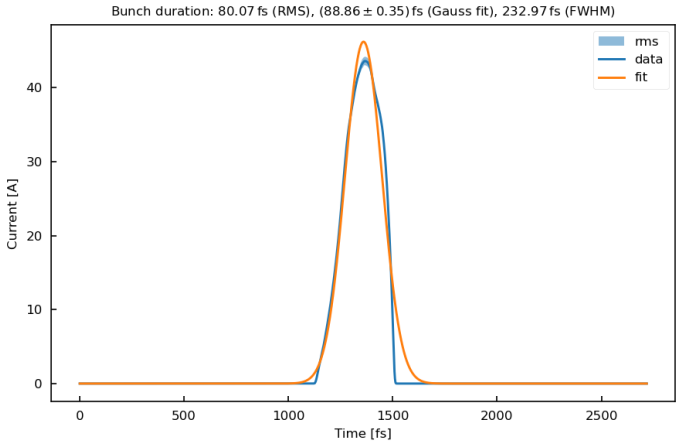
- Nicely focused on EA.A1 (low charge)

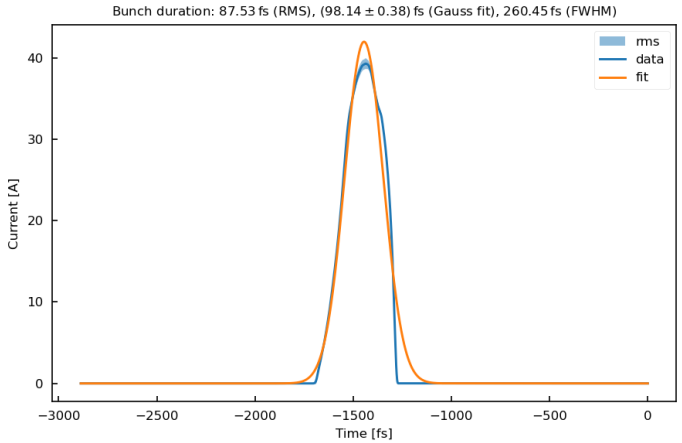






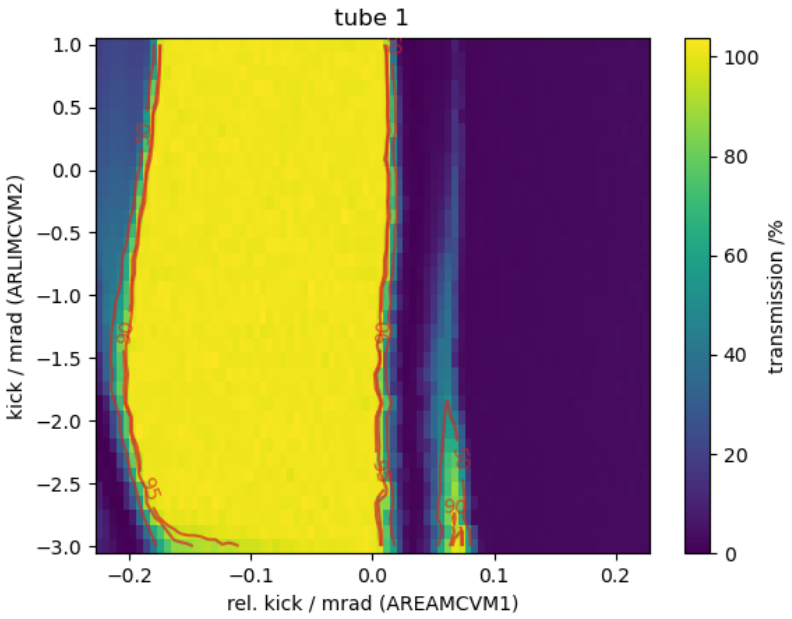
- Transported to PolariX

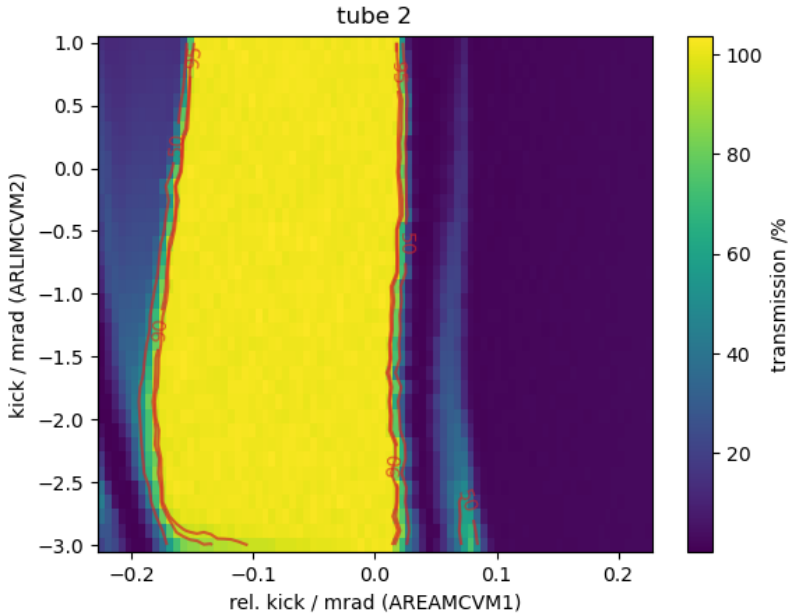


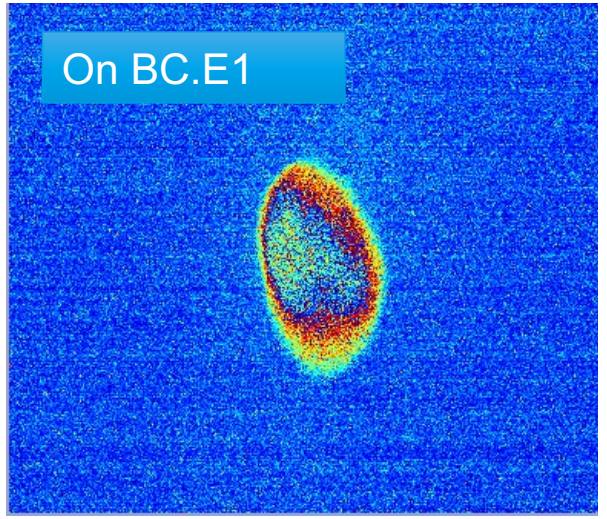


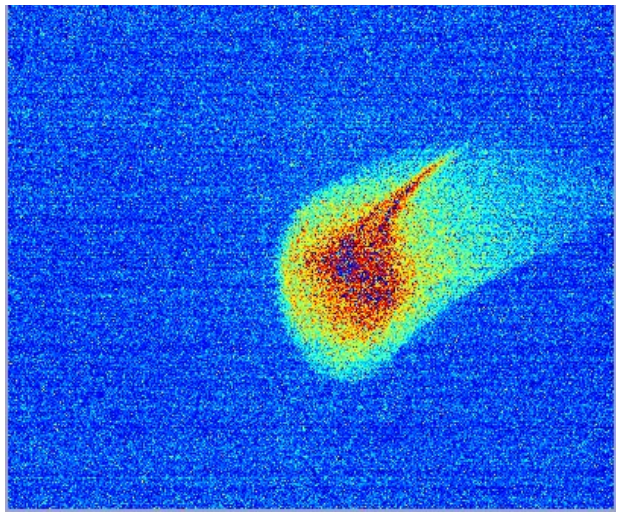
- 2D steerer scan preparation

Friday: Alignment and Offset scan









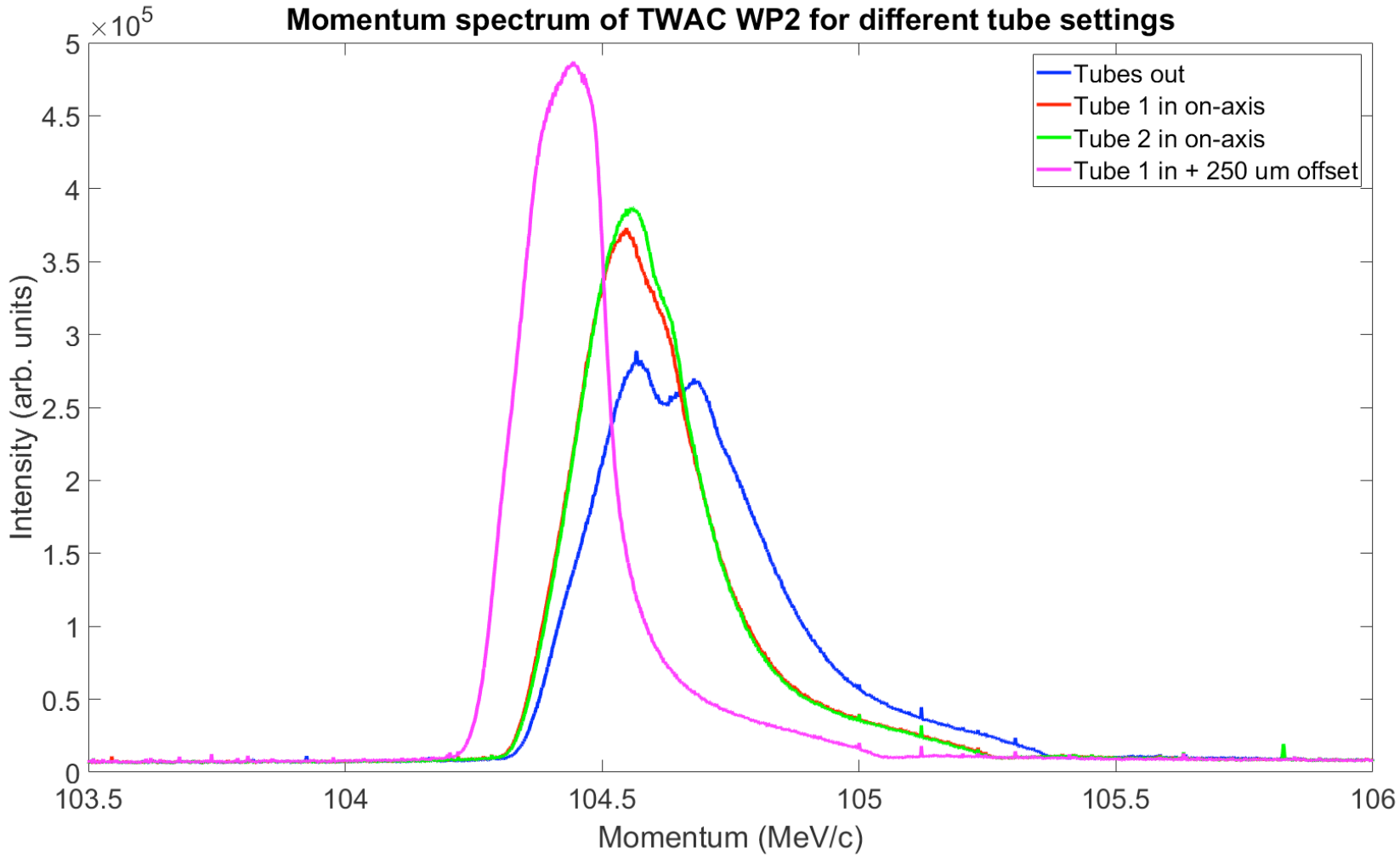
rotation around y-axis

angle /deg	width of plateau /mm (100%)
0.0	0.69
-0.24	0.52
-0.12	0.66 (wrong charge)
-0.12	0.73
-0.10	0.77
-0.08	0.78
-0.06	0.78
-0.07	0.79

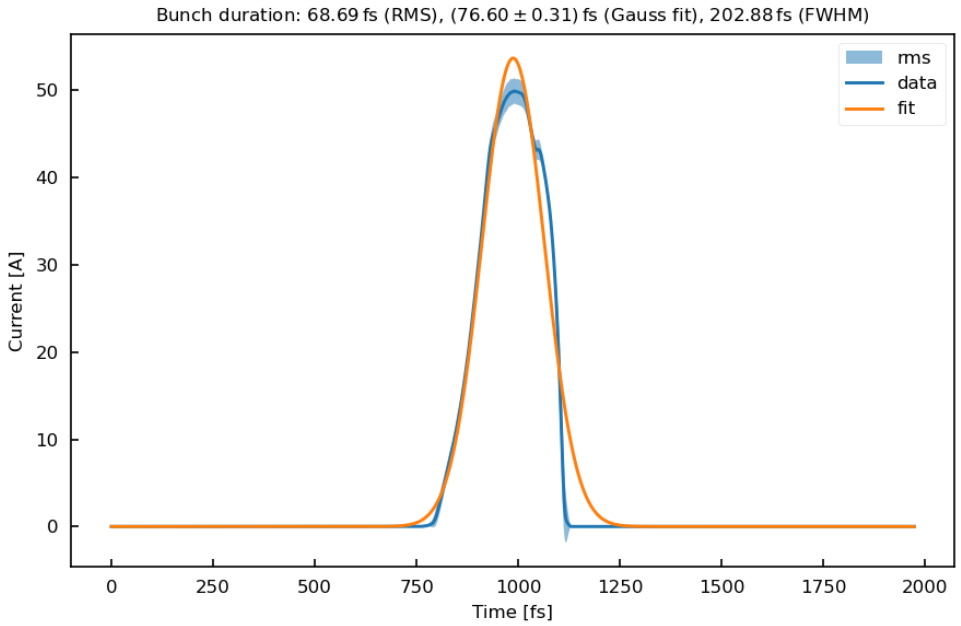
Y angle (deg)	X scan FWHM aperture (um)
-0.15	750
-0.1	830
-0.075	880
-0.0625	890
-0.05	900
-0.0375	890
-0.025	870
0	820
0.05	730

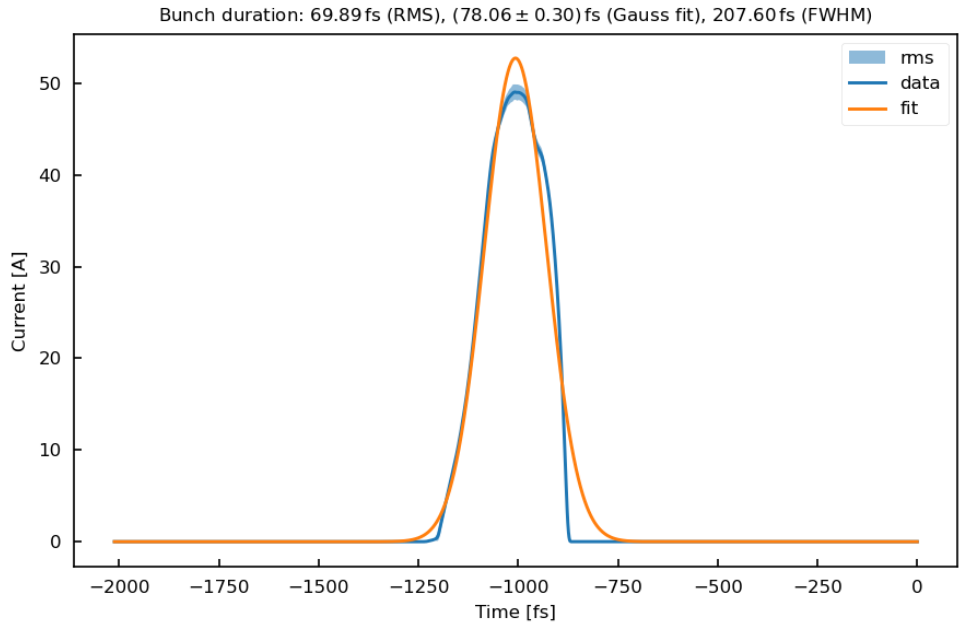
Spectrum measurements with tubes

Influence of longitudinal wakefield



PolariX meausurements with unfocused beam





10 to 20 fs shorter than with focus in EA

Required Next Steps for TWAC

With respect to beamtime

- Probing Monotonicity Condition and Cross-streaking with PolariX
- Setting up 20 MeV WP and Streaking

Schedule and Plan for the Week

Week 10

Date	Shift Crew
04.03.	--
05.03.	Hannes
06.03.	Hannes, Max
07.03.	Hannes
08.03.	Sonja (?)

- Tue: MPC tests, Setting up WP for UKE
- Wed - Thu: UKE beamtime

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