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Advanced Rare Isotope
Laboratory (ARIEL)

e-Linac status

Stephanie Diana Rädcl

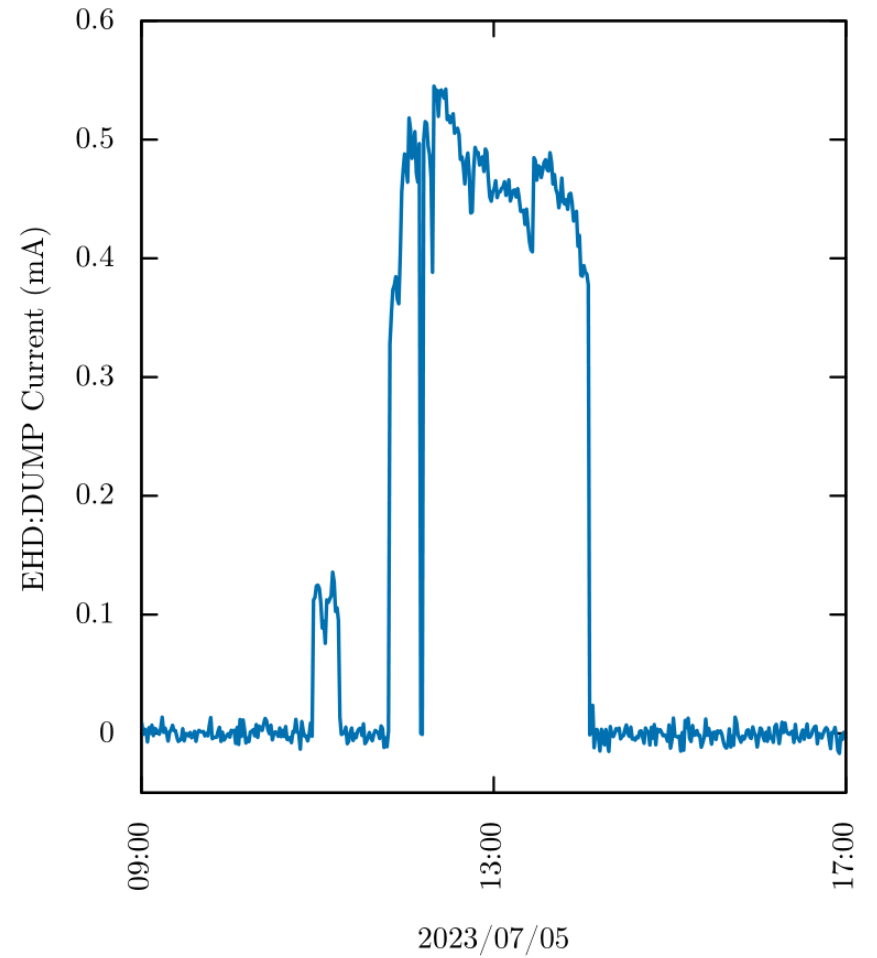
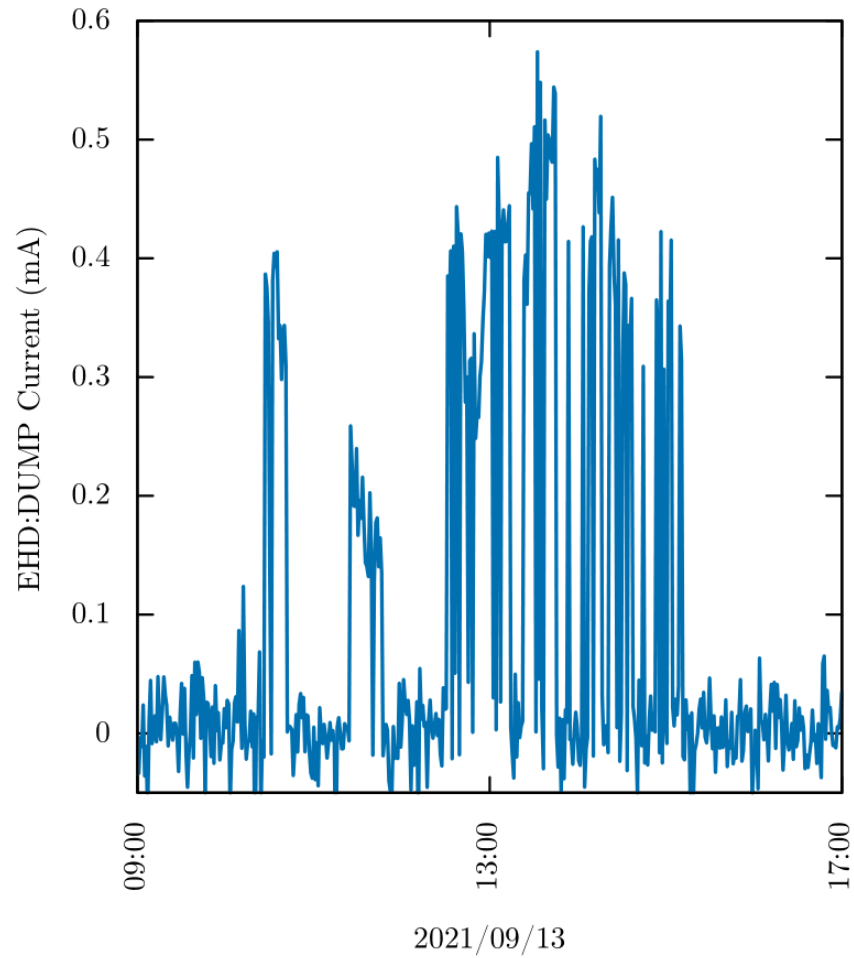
Accelerator Division

2024-07-10



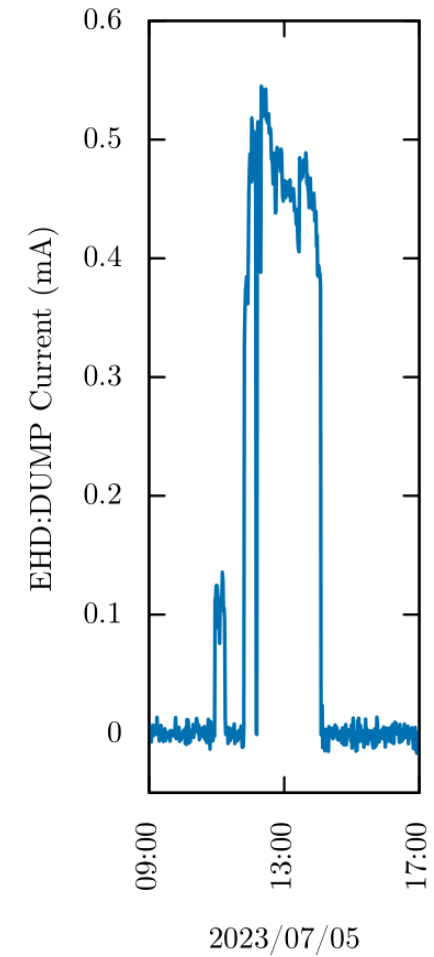
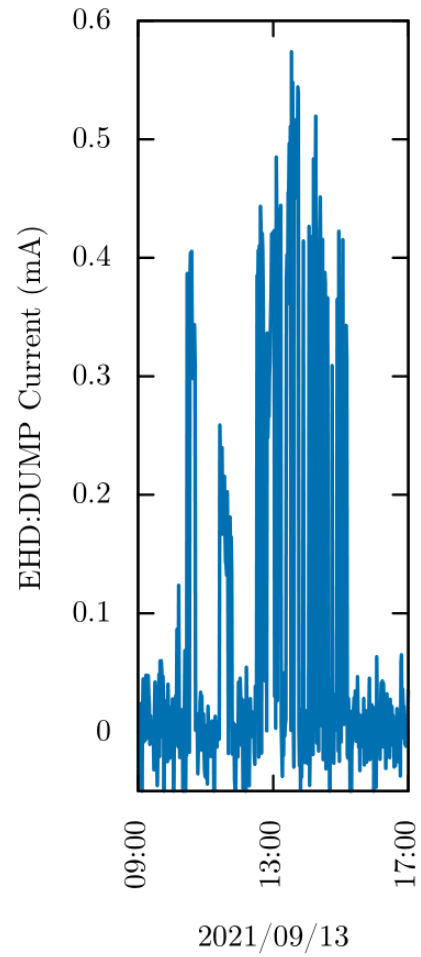
Discovery,
accelerated

Status: a typical beam delivery day



The beam current at the EHD:DUMP on a typical beam delivery day.

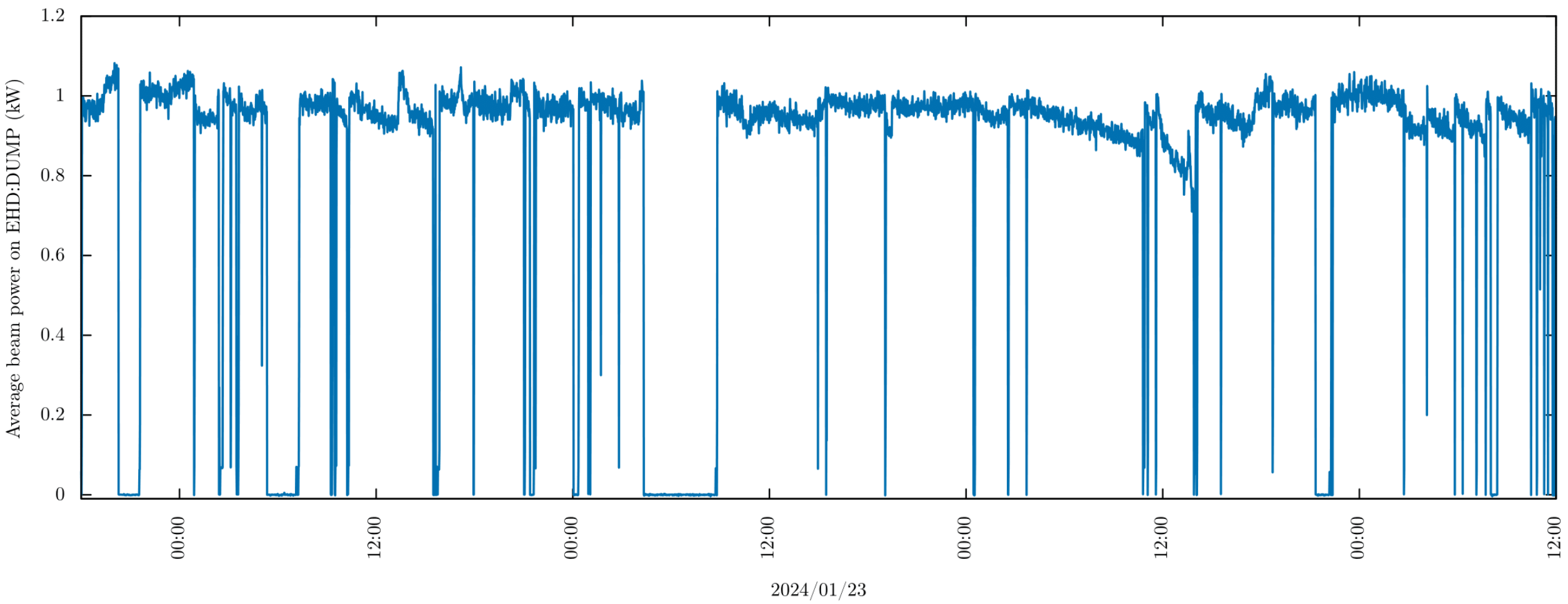
Status: a typical beam delivery day



The beam current at the EHD:DUMP on a typical beam delivery day.



3 days of continuous beam delivery



This was with the turbine and the re-designed e-gun matching circuit in place.

Collimator in ELBT → ELBT:MCOLO

./edl/elbt_optics1.edl@acsuser

ELBT OPTICS (1) Jul 08 11:02:47

Interlocks Bypassed Forces in Effect

ELBT:IV2 open shut

ELBT:YCB2B -0.8 0.00 0.8 0.0003 A

ELBT:XCB2B -0.8 0.00 0.8 0.0001 A

ELBT:BPM2

ELBT:VS2 Out @Targ1 @Targ2 @Targ3

ELBT:RFSH2 out in Peak -8.47e-03 V Avg -6.63e-03 V

ELBT:FC2 out in -1.22e-06 A Beam Dump 300W

ELBT:YCB2A -0.8 0.11 0.8 0.1096 A

ELBT:XCB2A -0.8 0.10 0.8 0.0994 A

ELBT:SOL2 -5 1.00 5 0.9997 A

ELBT:YCB1 -0.8 -0.50 0.8 -0.5011 A

ELBT:XCB1 -0.8 0.20 0.8 0.2001 A

ELBT:SOL1 -5 2.65 5 2.6482 A

ELBT:BPM0

ELBT:FWS0 NOT INSTALLED

ELBT:VS0 Out @Targ1 @Targ2 @Targ3

ELBT:RFSH0 out in Peak 4.56e-03 V Avg 4.62e-04 V

ELBT:MCOLO Out @ 1.1mm @ 0.8mm @ 0.5mm @ 0.2mm

ELBT:YCB0 -0.8 0.25 0.8 -0.4986 A

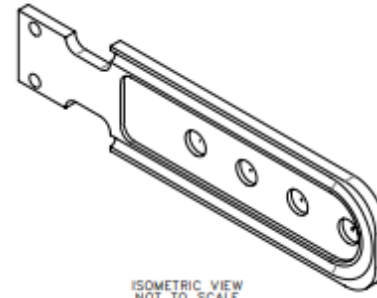
ELBT:XCB0 -0.8 0.25 0.8 0.2507 A

ELBT:BUNCH

ELBT:HC 0 26.60 40 26.5837 A

P/S on P/S off Fiddle Next/Prev

Panel is python-generated 2021-July-29



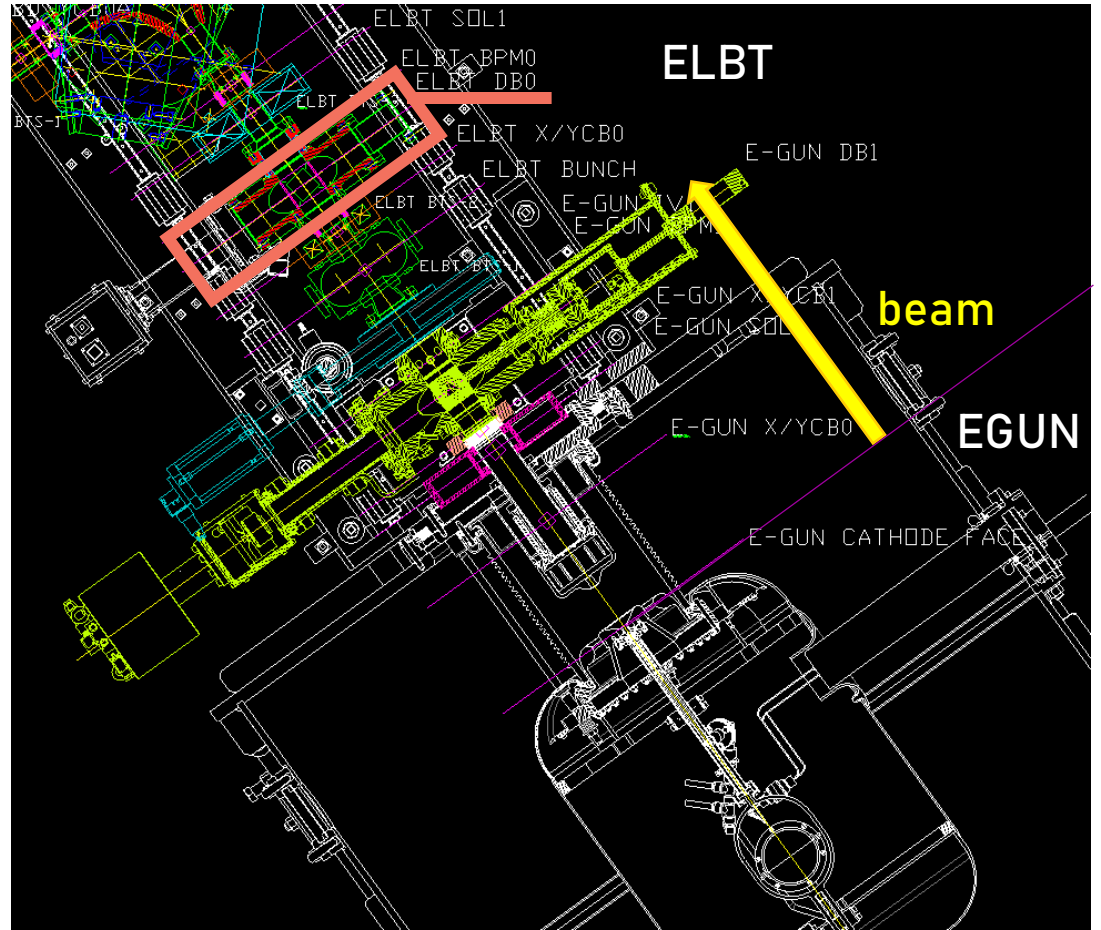
Multi-Position Collimator (MCOLO) =in =out

- Moves in/out by use of a motor and indicates the position using the position read-back

20210706 152300 Template: Document-116020 Rel.5

E-LINAC Operators' Manual - Section 3.7 - Beam Tuning			3.7
Document-135640	Release No. 2	Release Date: 2021-07-06	(6 of 53)

- Each position has a different sized collimator
- Used for isolating a small portion of the beam spot (individual beamlets)
- Water cooled



ELBT:MCOL0 300 μ A results



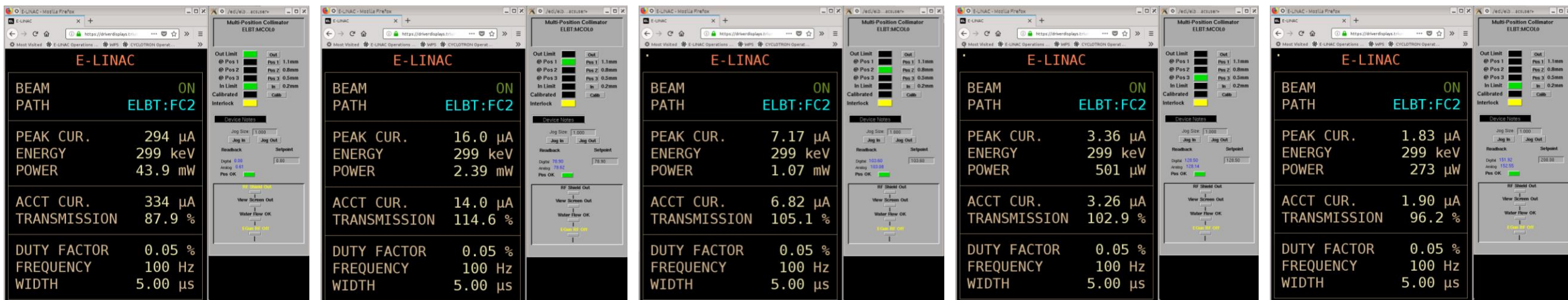
out

1.1 mm

0.8 mm

0.5 mm

0.2 mm



300 μ A

16 μ A

7.2 μ A

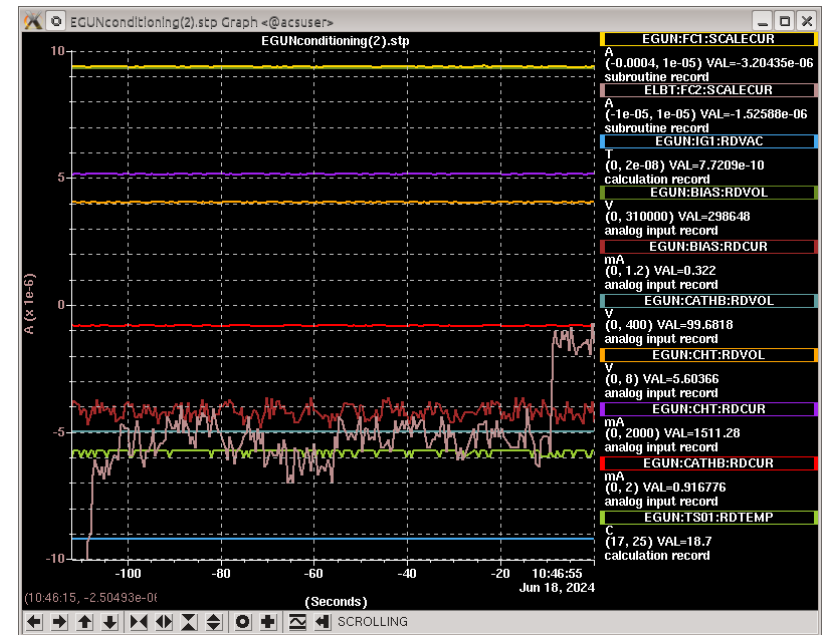
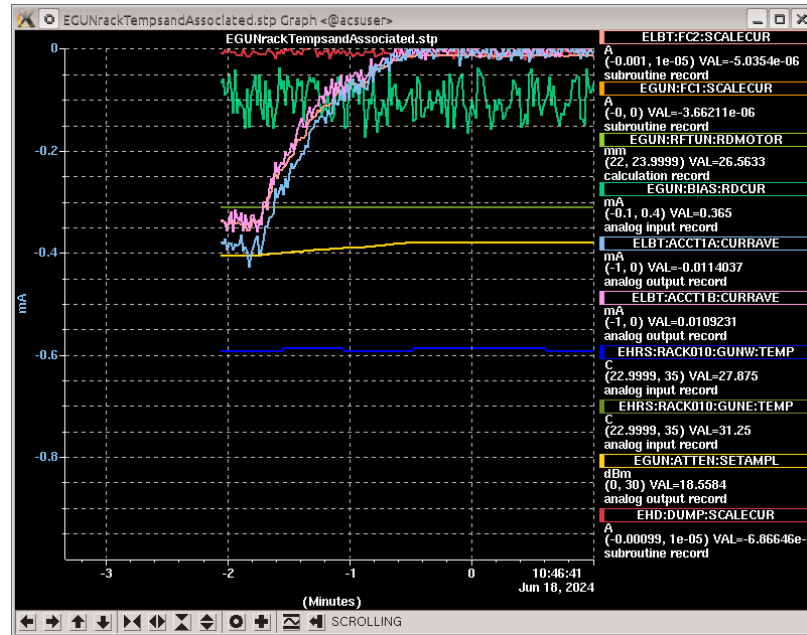
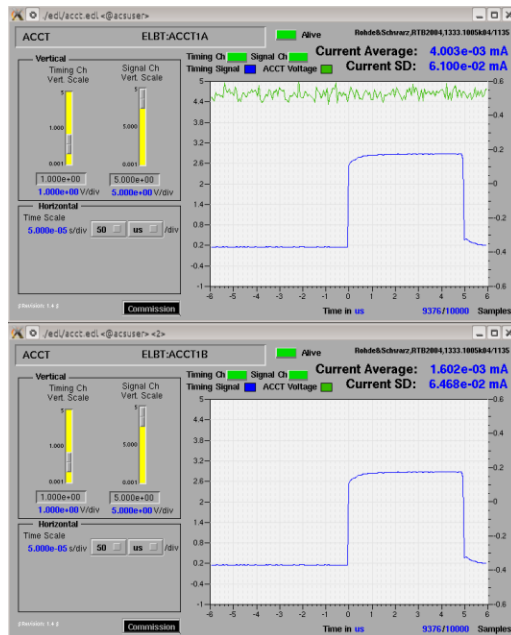
3.4 μ A

1.8 μ A

Scales to surface area, except for 0.2 mm case.

Tested minimum current reading for our diagnostics

- The ACCT readings fall into noise levels at around 5 μA peak current. The FC readings fall into noise levels around 2 μA peak current.



E-Linac shutdown

- Shutdown needed to take place March to April to allow for the installation of the beam line 4 north collimator. This affected the shielding of the e-hall.
- Shutdown started early February to investigate an increasing current load on our high voltage system. The issue was tracked down to the resistor box. We replaced 2 connectors and changed the tank oil.
- End of April: a PLC in our ALAT cold box failed. => Trouble shooting and cryogenic re-commissioning until two weeks ago, started cooldown last week.

Cooldown update

2024-07-06
12:28:54

Summary: Main compressor tripped. Contacted David Kishi.

Detail: *(No additional detail)*

[Make Comment](#)

- Riley Schick-Martin

2024-07-06
14:03:32

Summary: Elinac main helium compressor has failed

Detail: The main helium compressor cannot be restarted. It will need some significant troubleshooting and repair.

[Make Comment](#)

- David Kishi

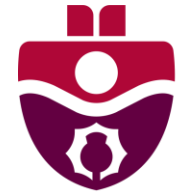
e-Linac Main Helium Compressor troubleshoot
is currently underway, as we speak.

At the moment we don't know when we
can resume accelerated beam.

Thank you
Merci



JOHANNES GUTENBERG
UNIVERSITÄT MAINZ



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