

Preparation and Delivery of the Laser Beam at 1 PW configuration

PREPARATION

1. Pump lasers maintenance
2. Beam alignment till DB
3. Measurements:
 - focus optimization
 - pulse duration
 - ps-contrast
 - ns-contrast
4. Beam alignment on BT till E5
5. CW introducing

DELIVERING

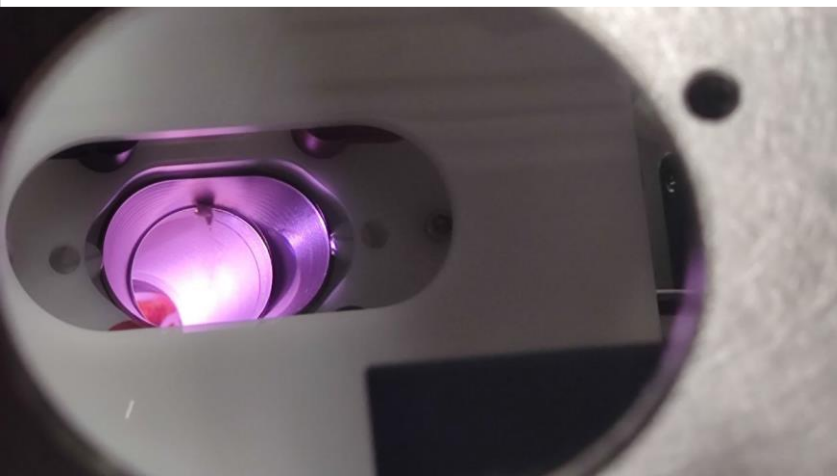
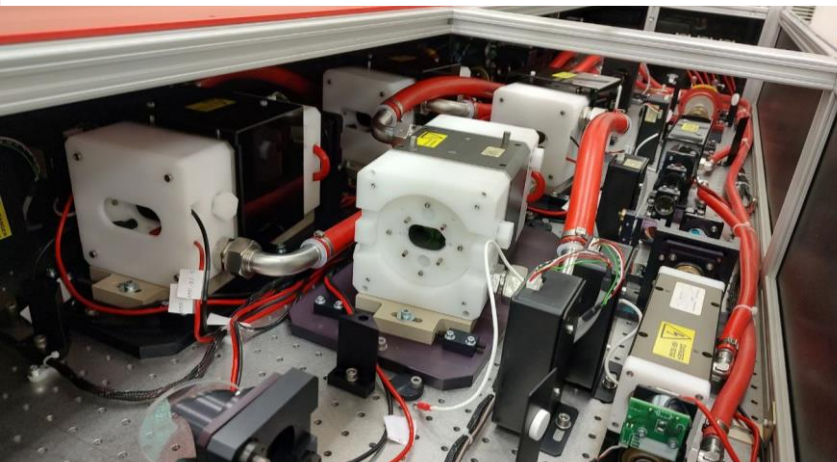
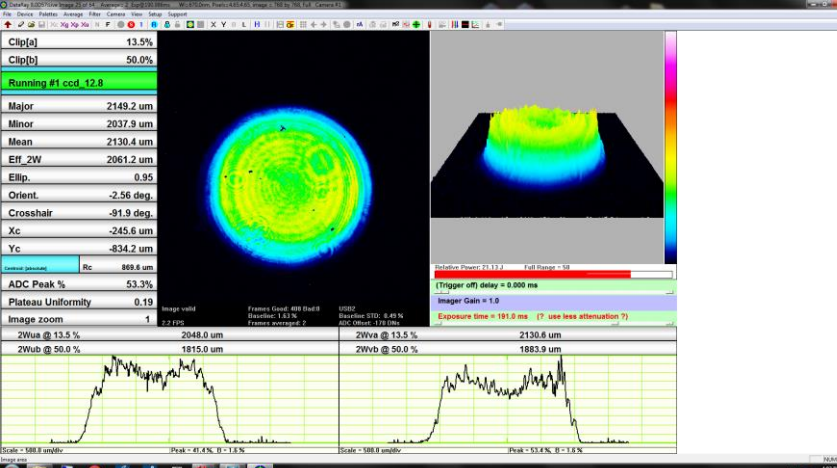
1. 25 uJ/CW: alignment and focus optimization
2. 20 mJ/CW: alignment and pulse duration optimization
3. FP(2 J) and FP: shooting
4. Monitoring ACIS, spectrum, beam profile, energy, NF & FF alignment, temperature and humidity.





1. Pump lasers maintenance





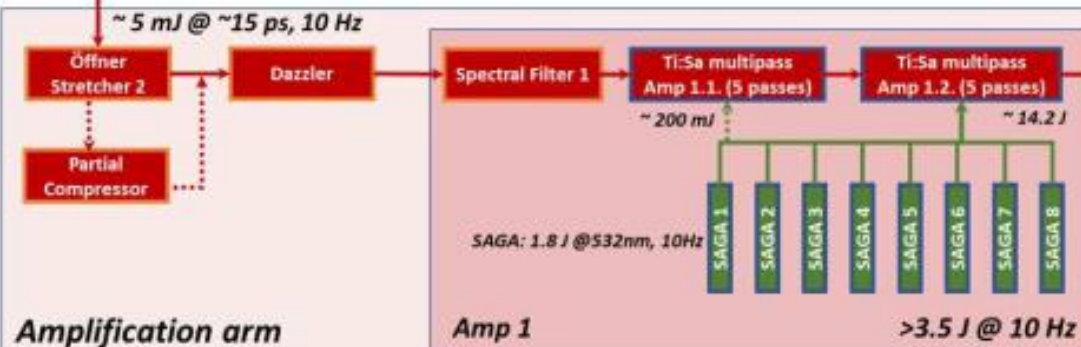
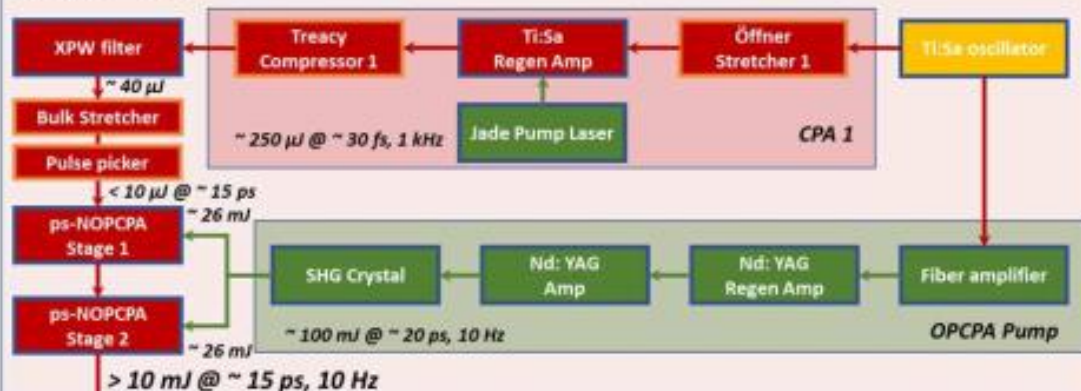
- flashlamps & optical components (if needed) replacing
- energy measurements (output/crystal)
- transmission verification after relay imaging tubes
- beam profile verification
- pulse duration measurements
- beam alignment on the amplifier crystal

2. Beam alignment:

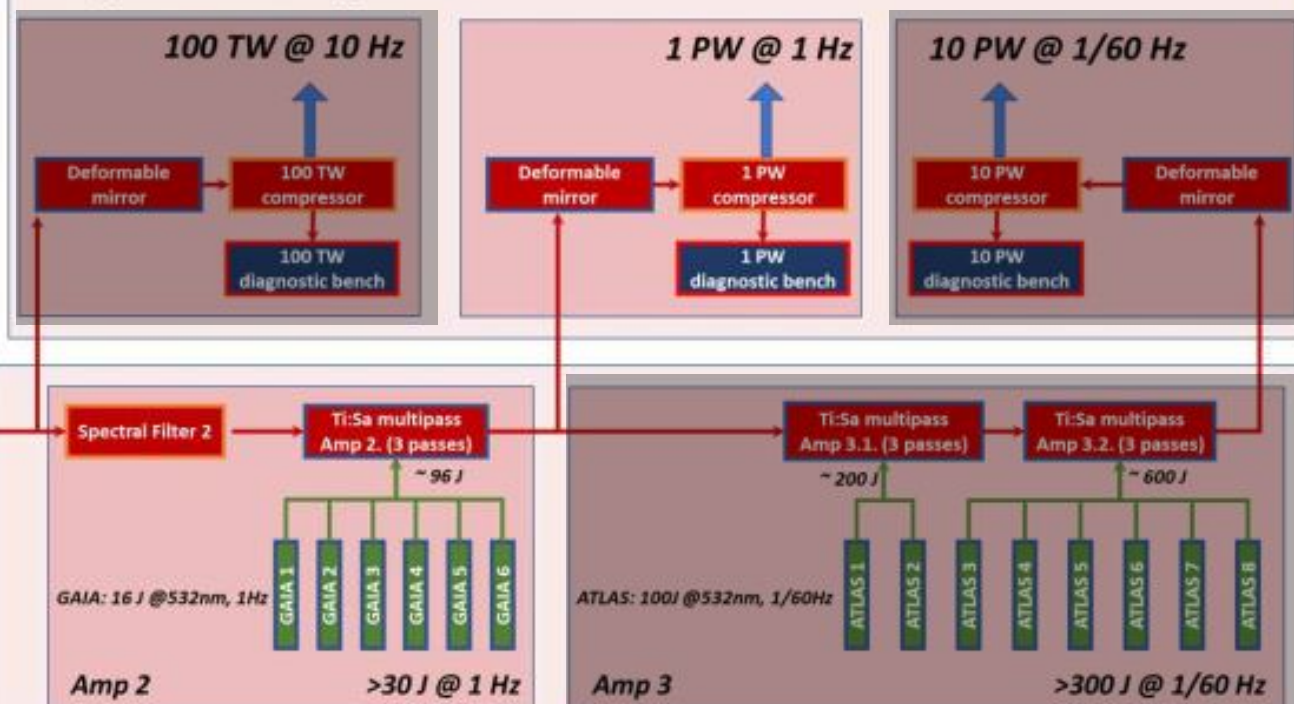
- Amp.1.1 -> Amp.1.2 -> Amp.2 -> DB

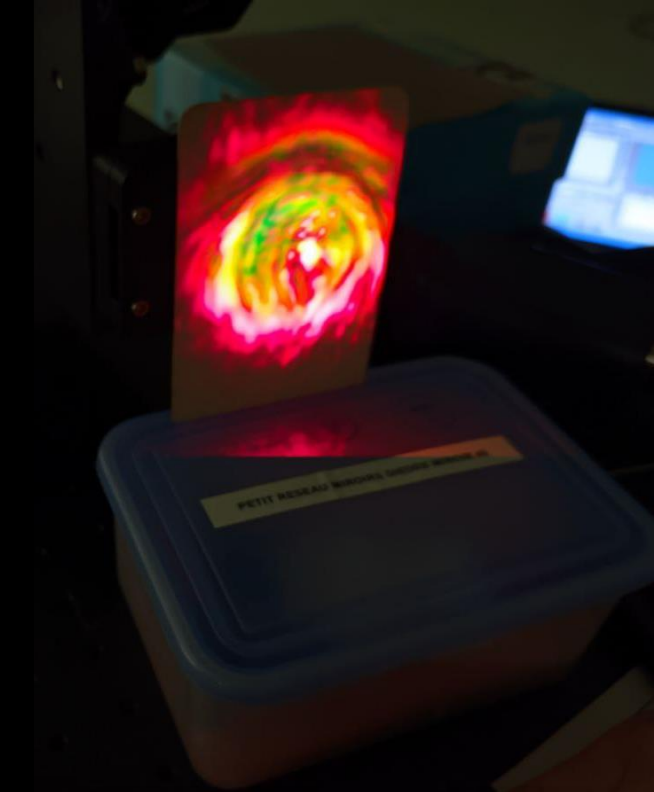
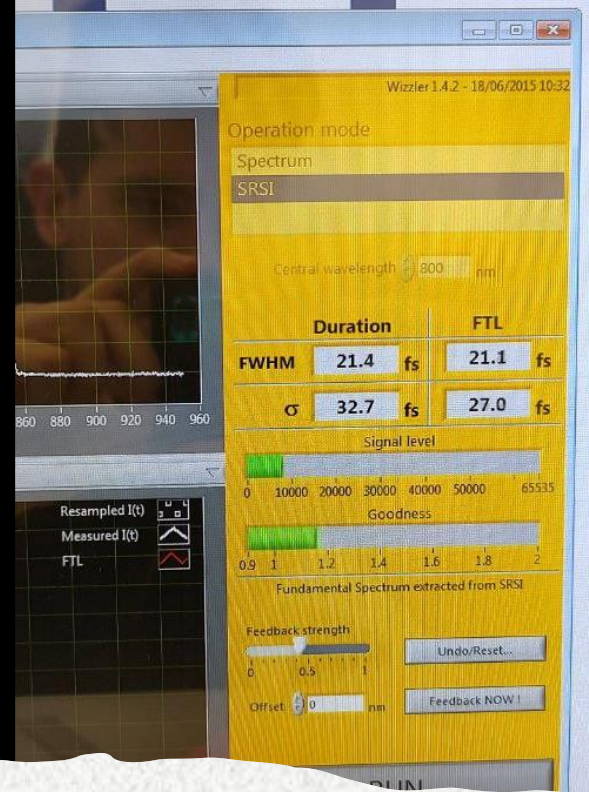
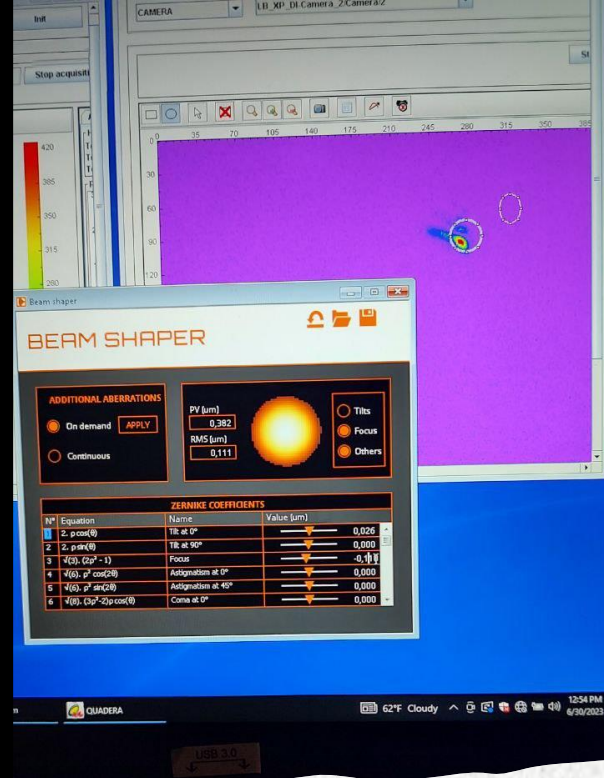
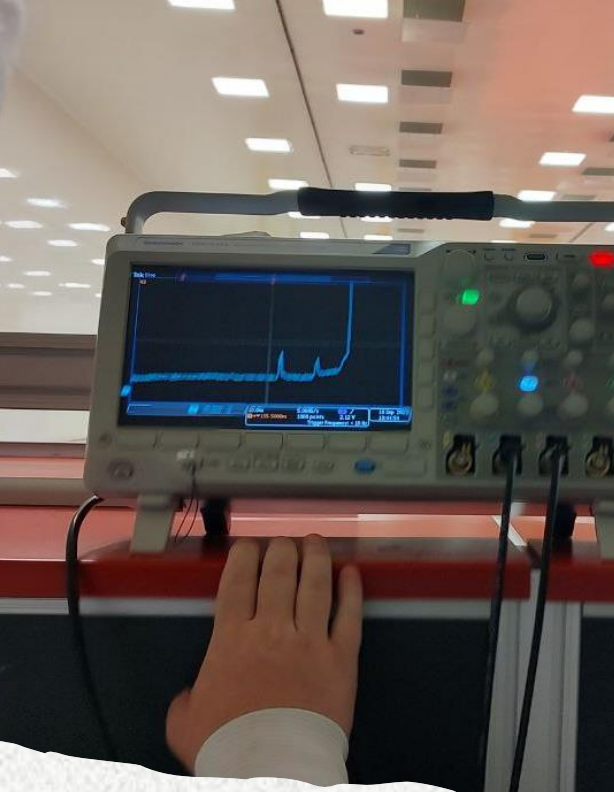


Front – End



Compression and diagnostics



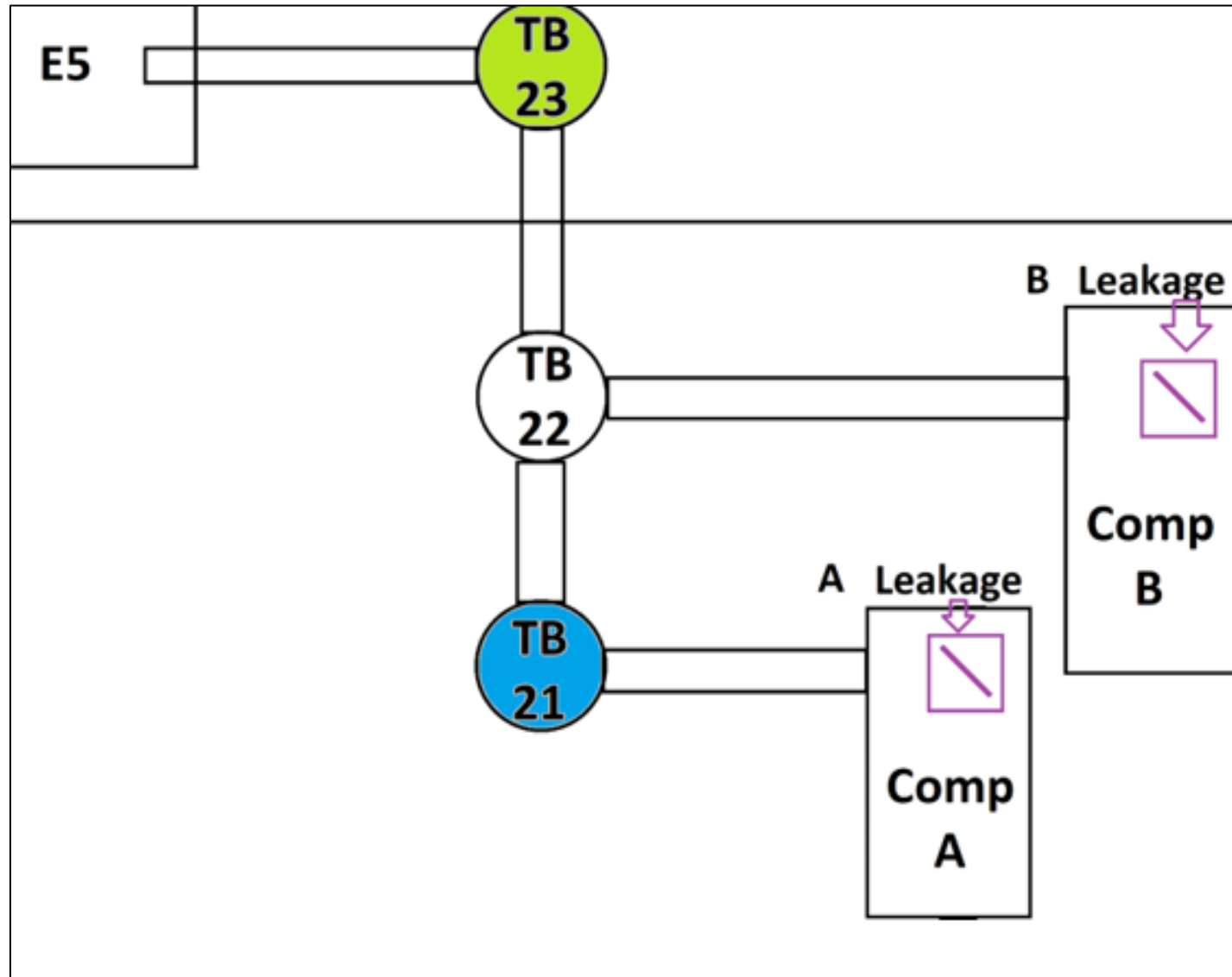


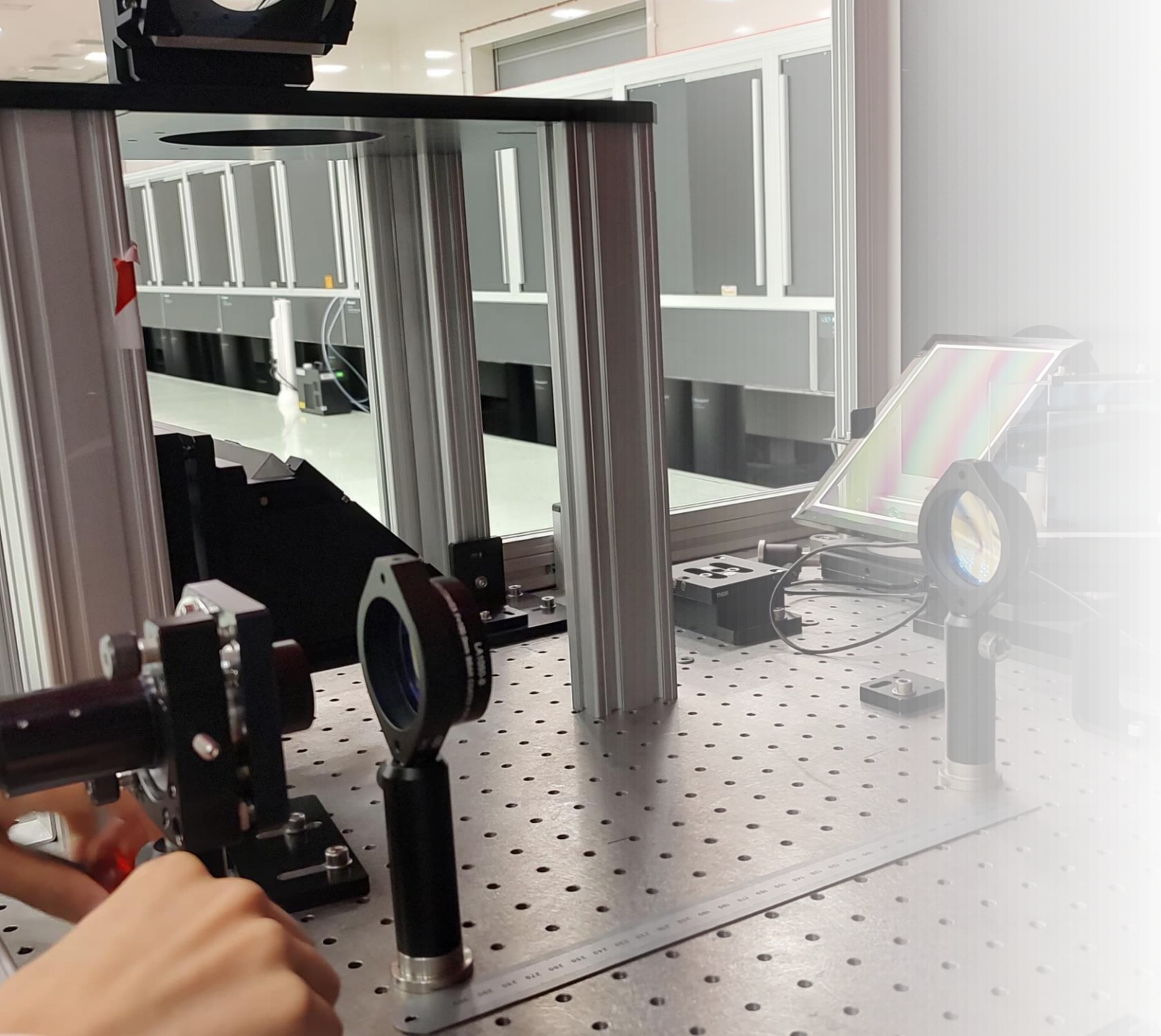
3. Measurements:

- focus optimization (DM <-> HASO)
- pulse duration (Dazzler <-> Wizzler)
- ps-contrast (TUNDRA)
- ns-contrast (oscilloscope)

4. Beam alignment on BT

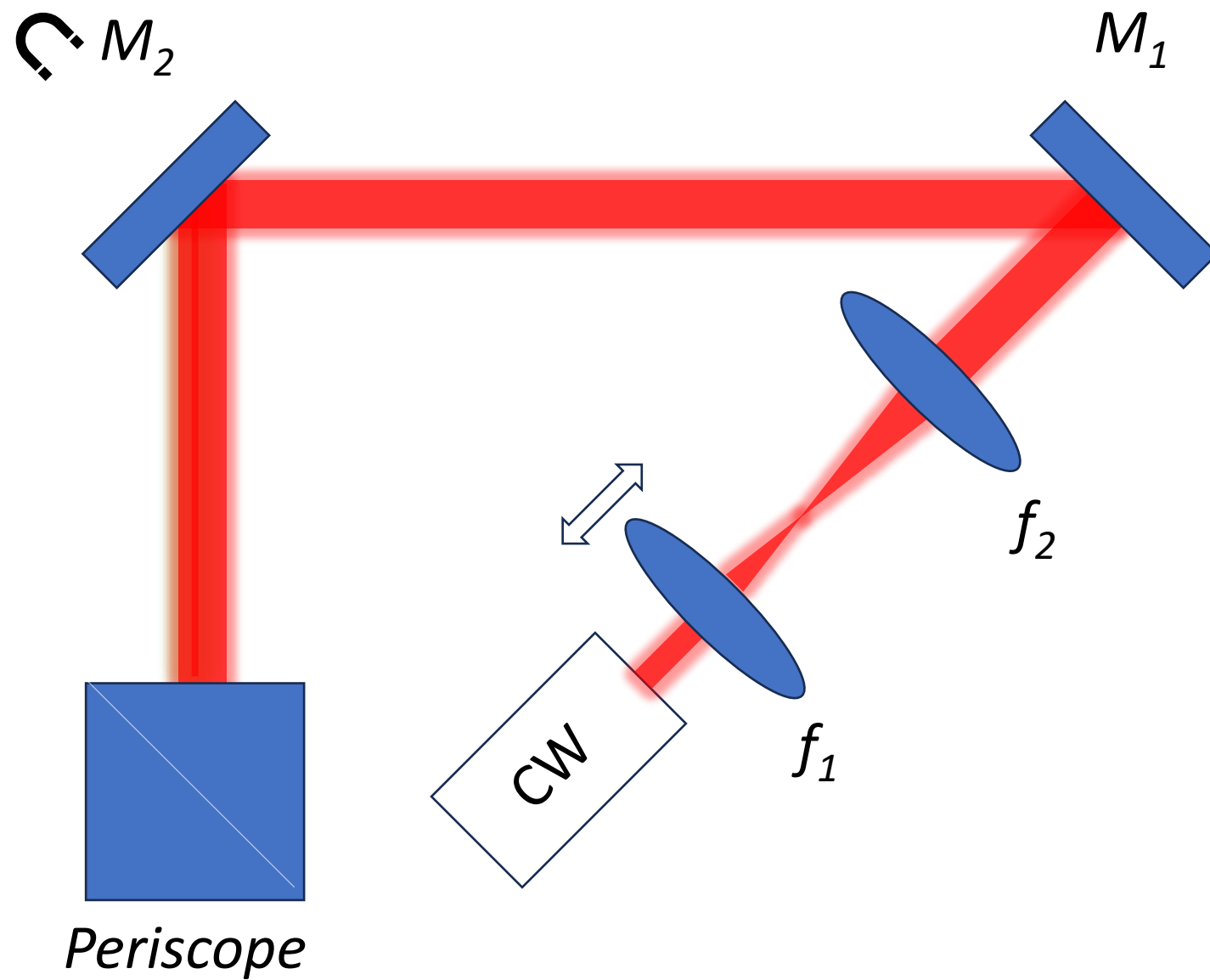


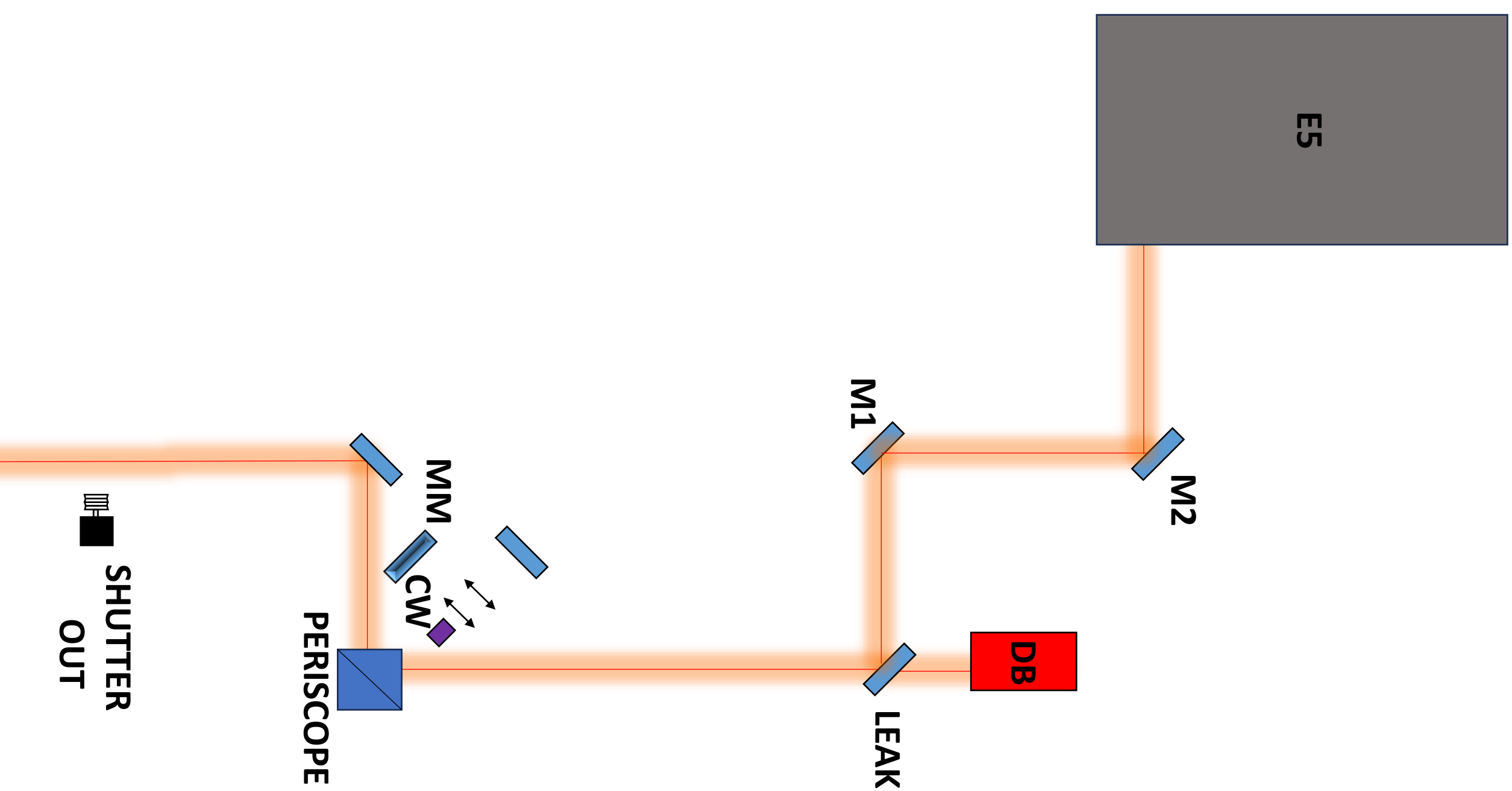


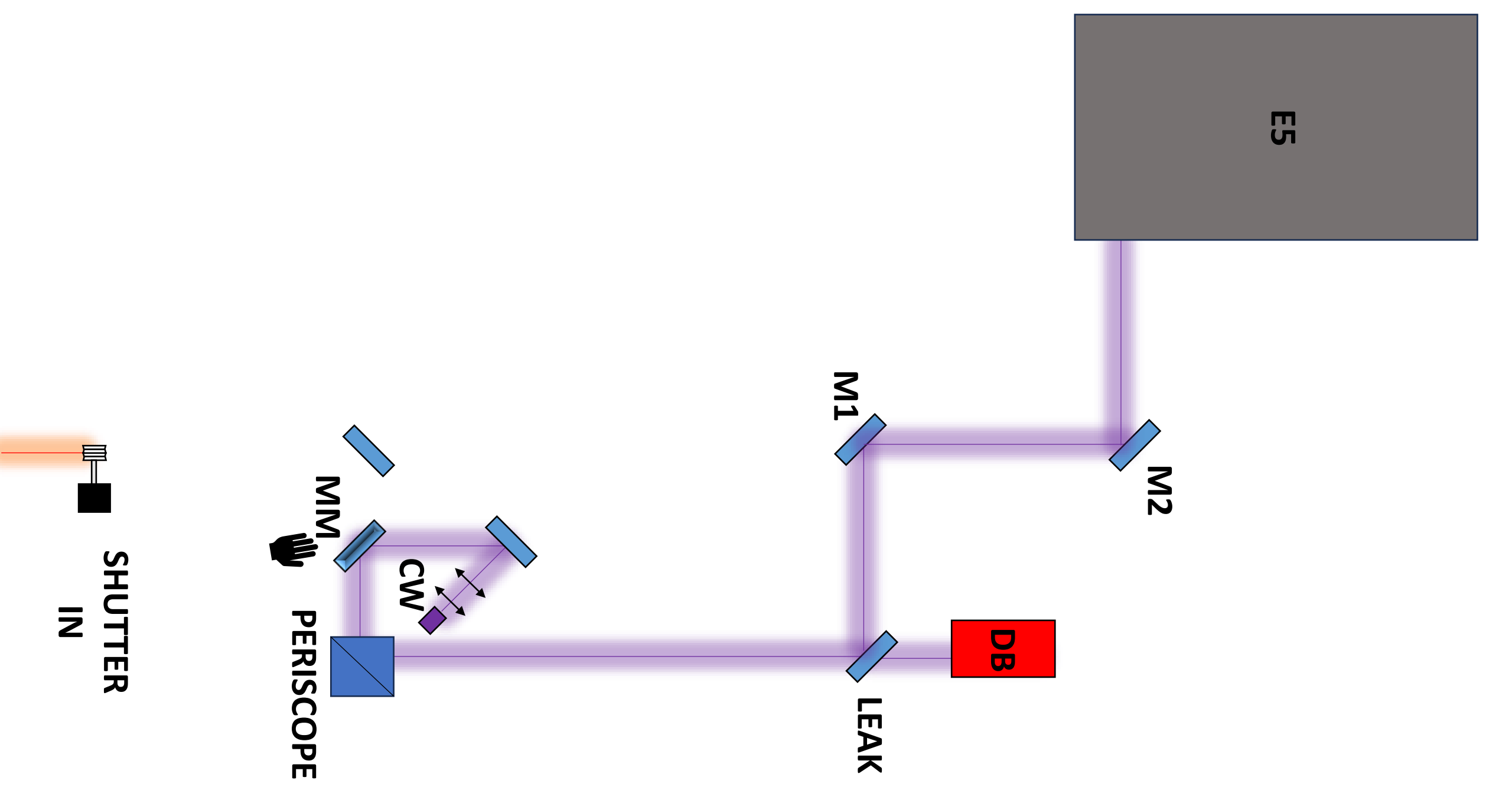


5. CW introducing

$SAL \varnothing 25 \text{ mm}$
 $f_1 100 \text{ mm}$
 $f_2 200 \text{ mm}$
 $M = 2$
 $\Rightarrow SAL \sim HPLS$
 After BEX $\sim \varnothing 120 \text{ mm}$







1. 25 uJ/CW: alignment and focus optimization:

E5 1PW (A) Energy Attenuation

Wedge and mirror reflectivities			
Wc	Wuc	M	Attenuator
C	U	M	A
0.015	0.08	0.99	0.001

Compressor efficiency	0.74
Energy after AMP 2	30 J

Wedge configurations				Output Energy before Compresor	Output Energy after Compresor
W1	W2	W3	Attenuator		
M	M	M	OUT	30 J	21 J
U	M	M	OUT	2.4 J	1.7 J
M	M	M	IN	30 mJ	21 mJ
M	U	C	IN	36 μJ	25 μJ

U-Uncoated Wedge; C- Coated Wedge; M- Mirror;

Beam shaper

BEAM SHAPER

ADDITIONAL ABERRATIONS

On demand

APPLY

Continuous

PV (μm)

0.000

RMS (μm)

0.000

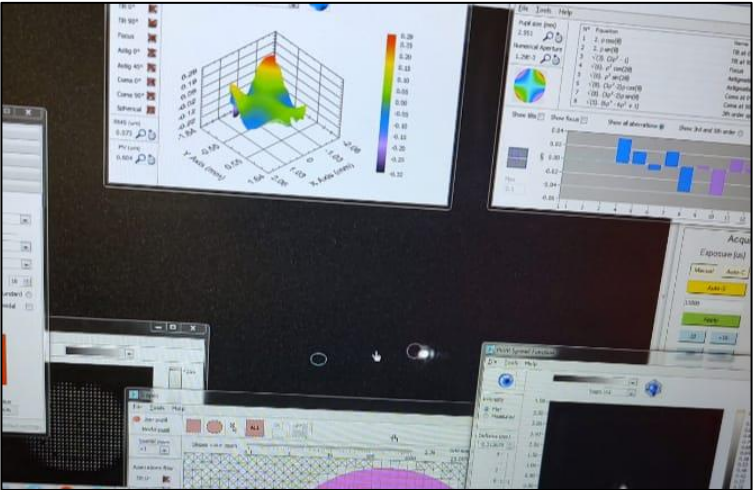
Tilts

Focus

Others

ZERNIKE COEFFICIENTS

N°	Equation	Name	Value (μm)
1	2. p cos(θ)	Tilt at 0°	0.000
2	2. p sin(θ)	Tilt at 90°	0.000
3	√(3). (2p² - 1)	Focus	0.000
4	√(6). p² cos(2θ)	Astigmatism at 0°	0.000
5	√(6). p² sin(2θ)	Astigmatism at 45°	0.000
6	√(8). (3p²-2)p cos(θ)	Coma at 0°	0.000



2. 20 mJ/CW: alignment and pulse duration optimization:

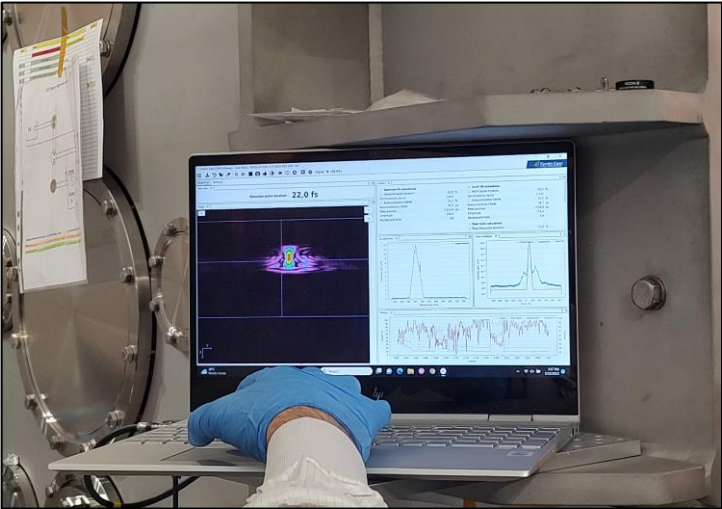
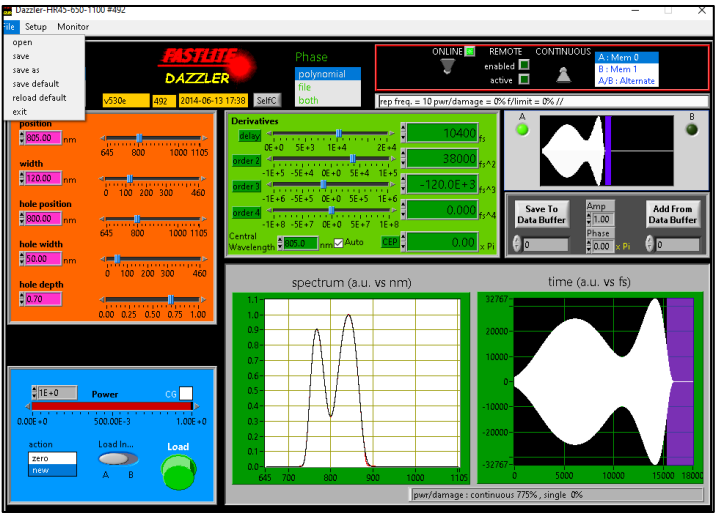
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U-Uncoated Wedge; C- Coated Wedge; M- Mirror;



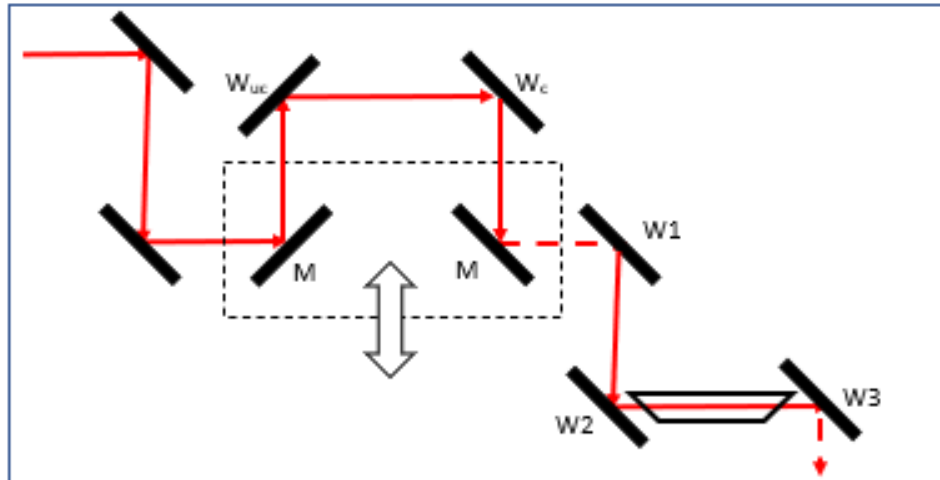
3. FP(2 J) and FP: shooting:

E5 1PW (A) Energy Attenuation

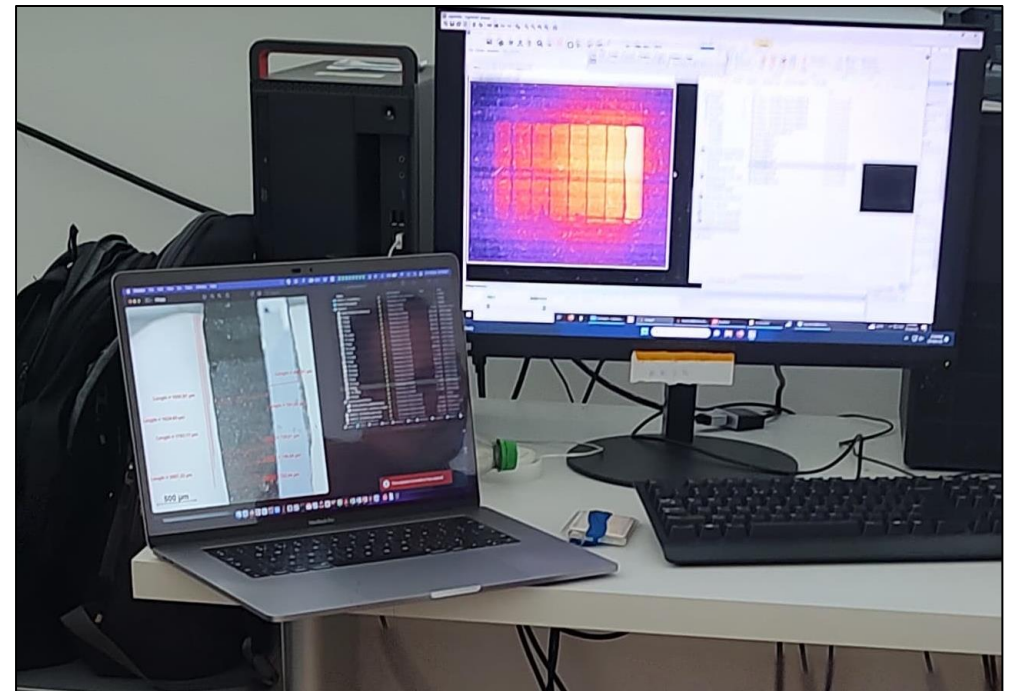
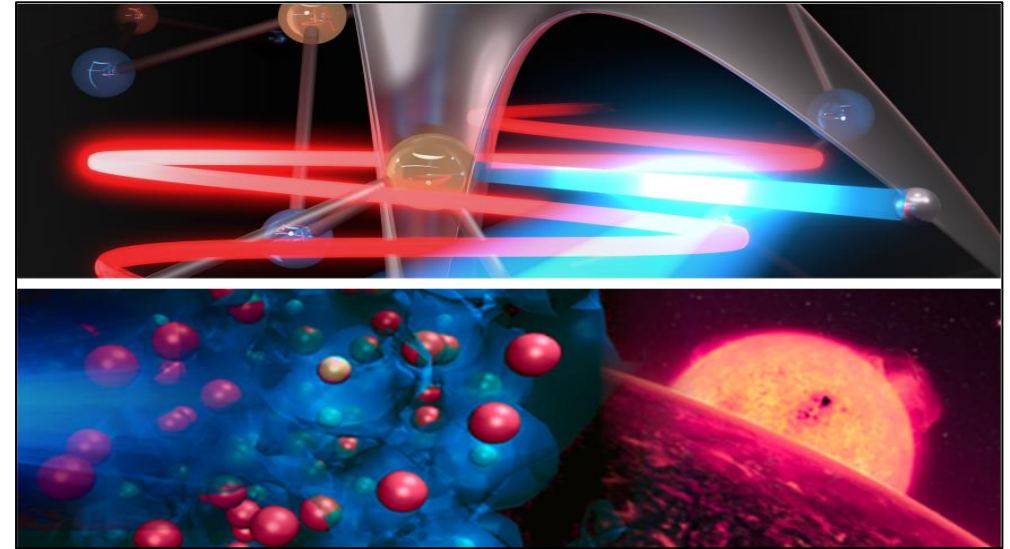
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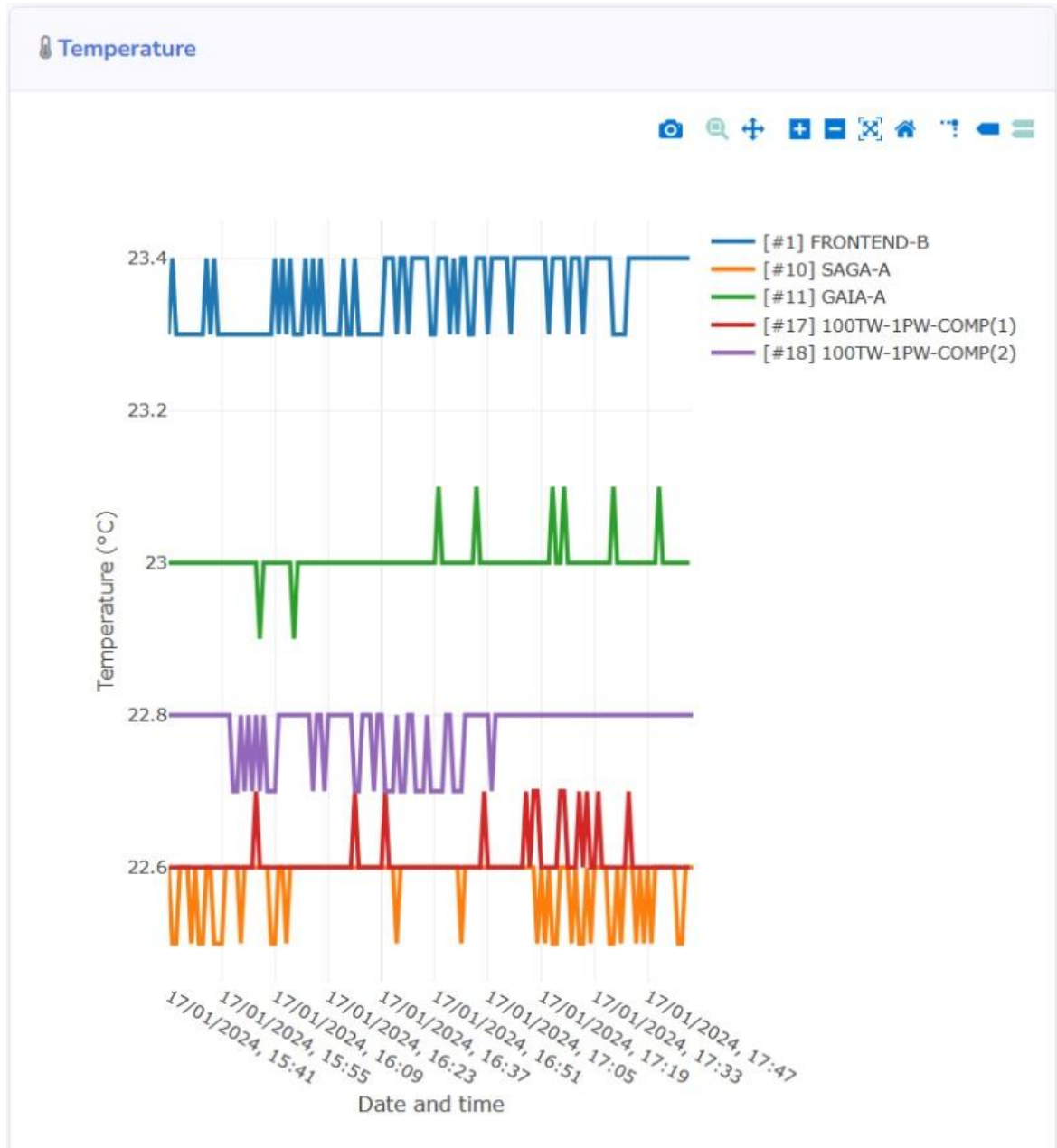
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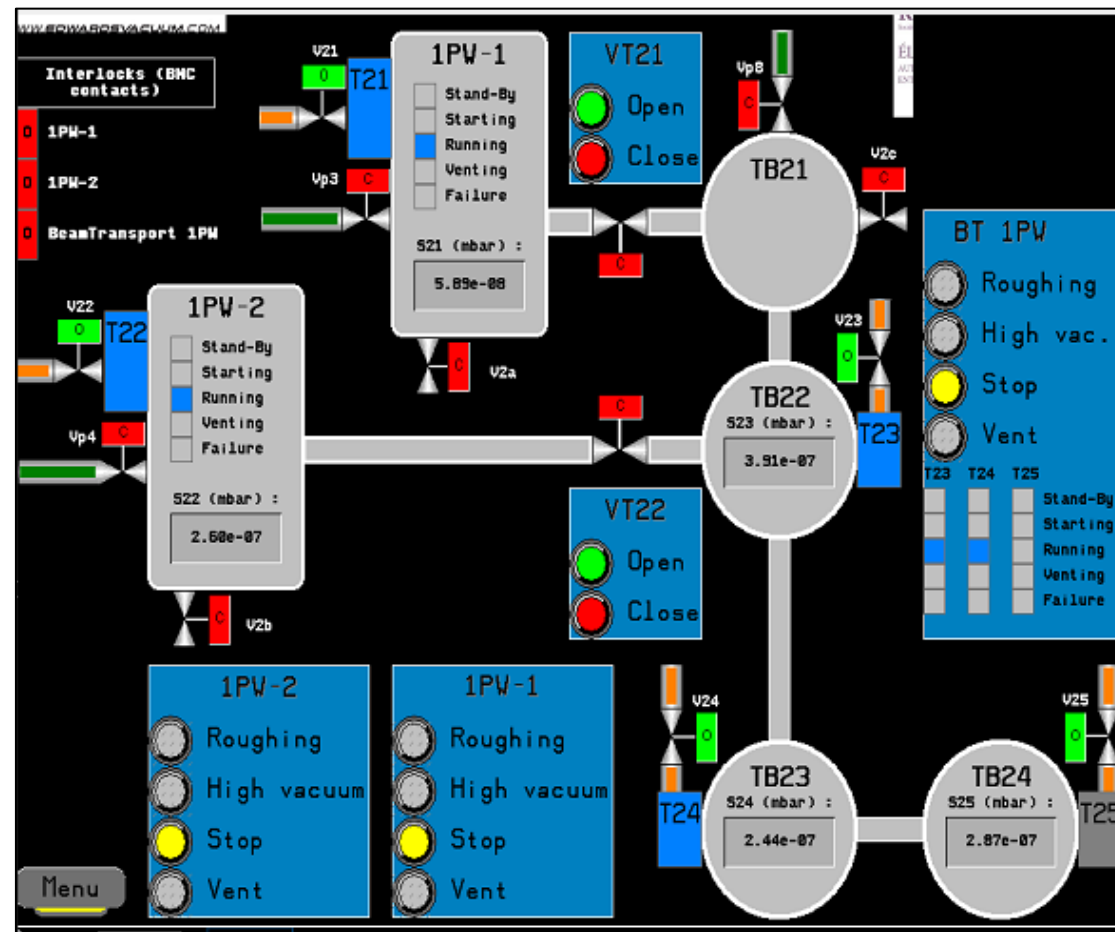
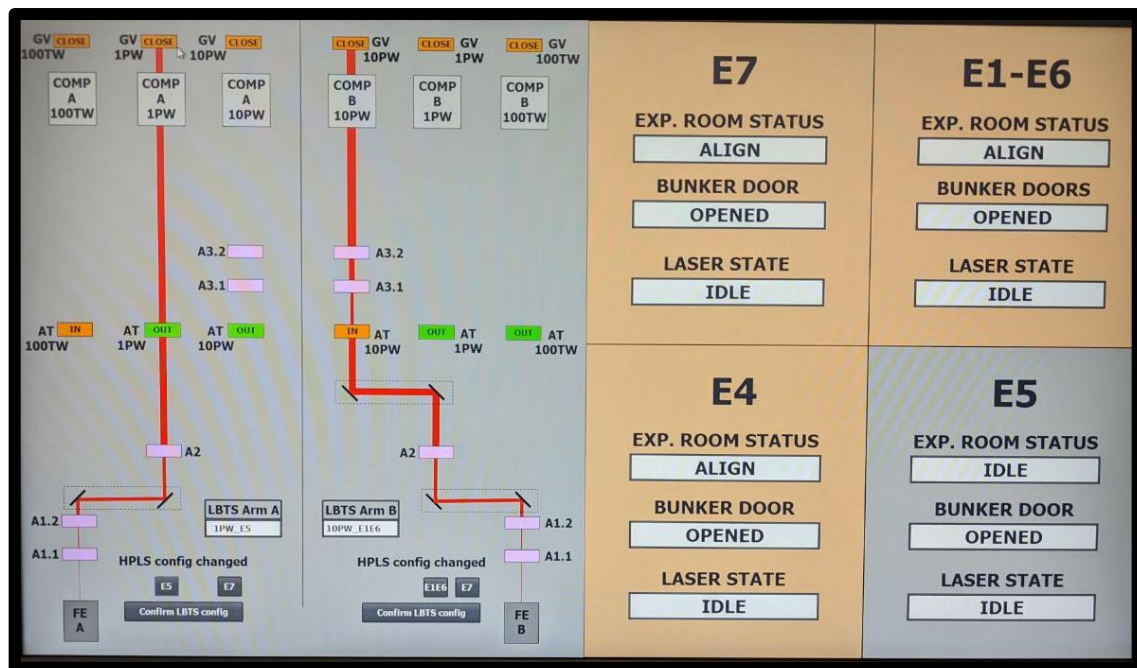


U-Uncoated Wedge; C- Coated Wedge; M- Mirror;



4. Monitoring ACIS, spectrum, beam profile, energy, NF & FF alignment, temperature and humidity.





Thank you for your attention!