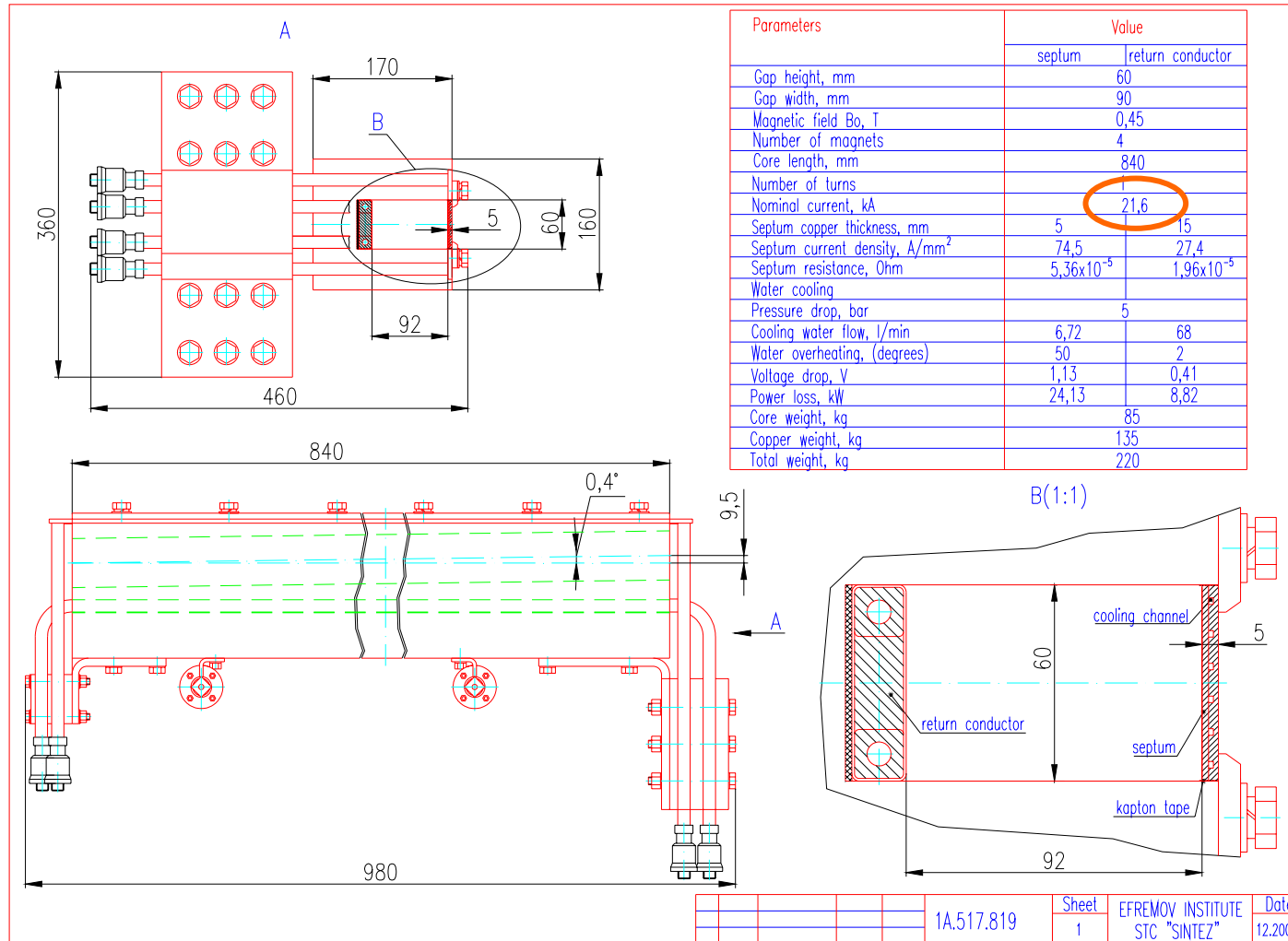
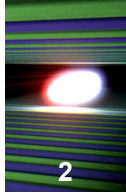
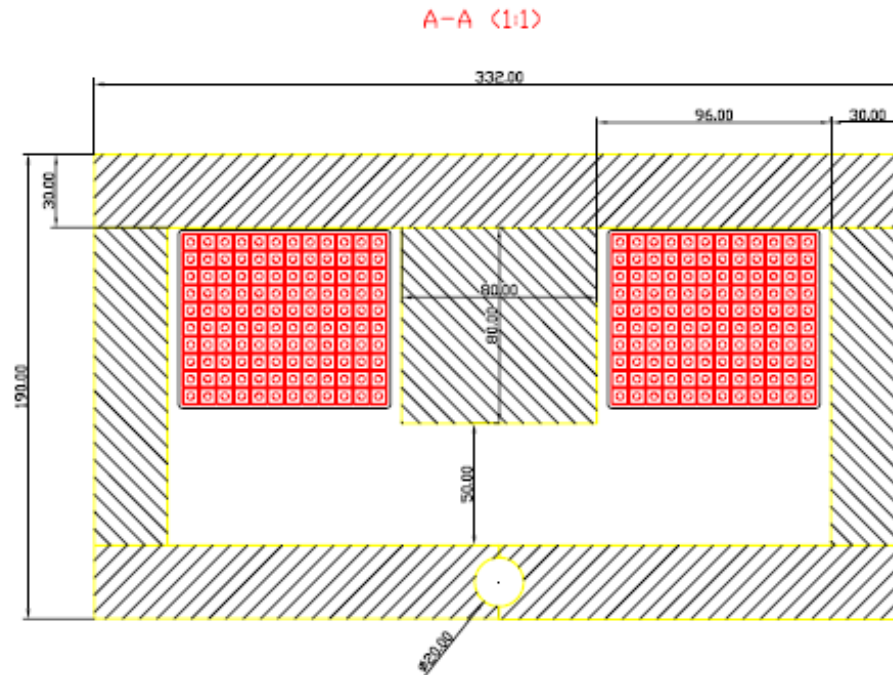
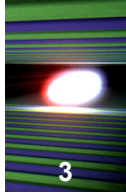




Mini-Workshop Kicker-Septum Scheme



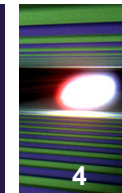




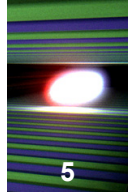
Parameters	Value
Air gap, mm	50
Magnetic field B_0 , T	0.42
Core length, mm	1000
$\Delta B/B_0$ at $R=40$ mm	0.15
Number of magnets	4
Number of winding turns	120
Nominal current, A	155
Conductor with dimensions, mm	6x6-#3
Current density, A/mm ²	5.4
Resistance, Ohm	0.183
Voltage drop, V	32
Power loss, kW	5
Copper weight, kg	480
Copper weight, kg	77
Total weight, kg	560
Water pressure drop, MPa	0.5
Water circuit	5
Water flow, l/min	2.3
Temperature overheating, °C	30

Lambertson-septum for the project X-FEL

Lambertson septum Parameters

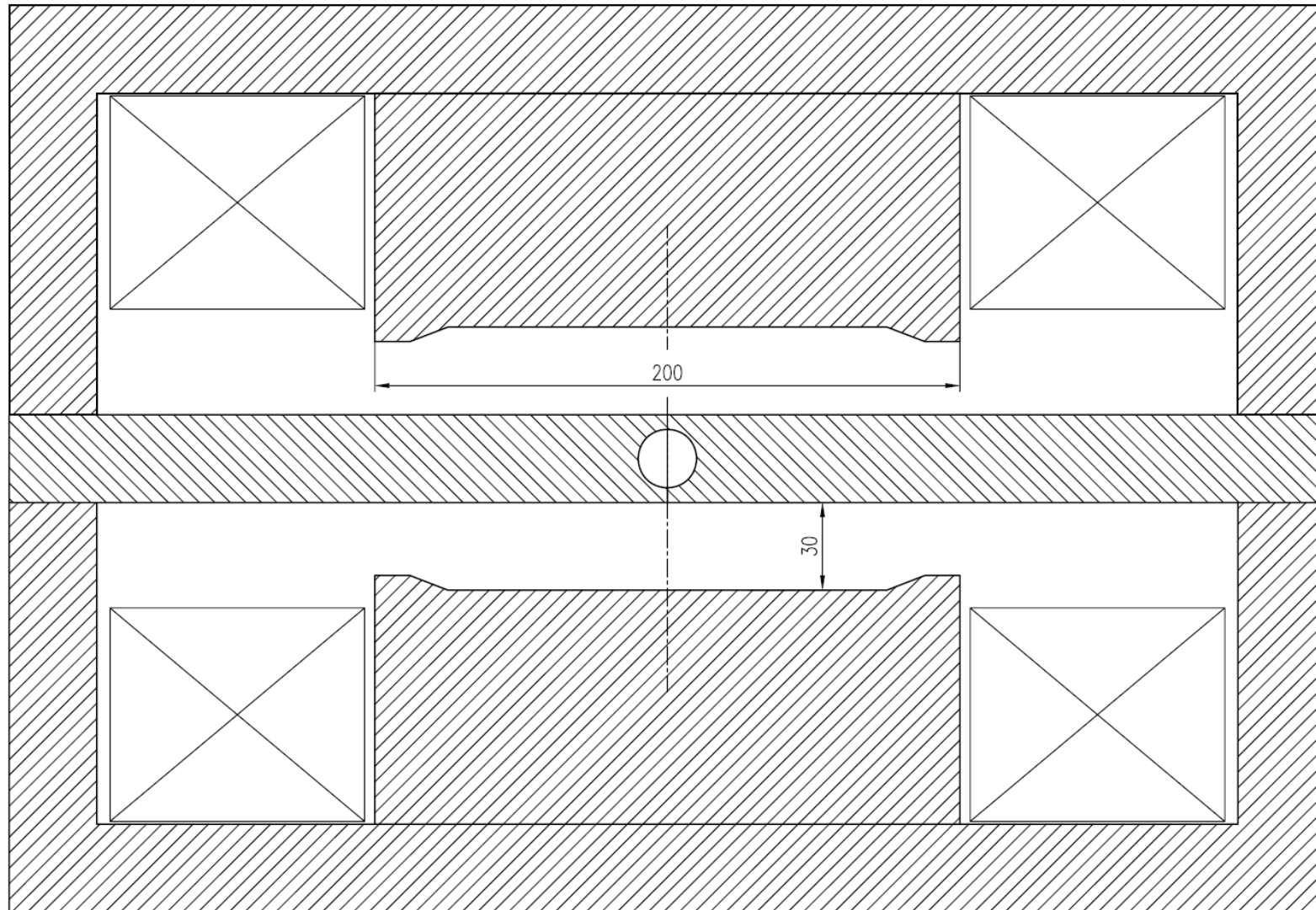
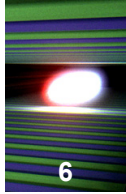


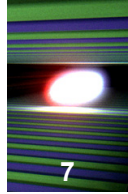
Parameters	Value
Air gap, mm	50
Magnetic field B_0 , max. T	0.42
Core length, mm	1000
$\Delta B/B_0$ at $W \times H = 10\text{mm} \times 10\text{mm}$	$< 1 \times 10^{-3}$
Number of magnets	4
Number of winding turns	120
Turn average length, m	2.54
Nominal current, A	141
Conductor with dimensions, mm	6x6- $\phi 3$
Conductor cross-section arrea, mm^2	28.7
Current density, A/mm^2	4.91
Resistance at 20 °C, Ohm	0.183
Voltage drop, V	28.4
Power loss, kW	4.06
Core weight, kg	287
Copper weight, kg	78
Total weight, kg	380
Water pressure drop, MPa	0.5
Water circuit	5
Water flow , l/min	2.3
Temperature overheating, °C	23



- A twin Lambertson septum was shown. The non-deflected beam will see a magnetic field of 2 Gauss within a 10 mm radius. Mu-metal shielding of the vacuum chamber can reduce the magnetic field further.
- The non-deflected beam sees at the end of the iron yoke a factor 1000 higher magnetic field. Calculation with an iron screen extension (the coil heads are then in the shadow of the iron screen) will be done to study this effect. We need information about the vacuum system in the region of the Lambertson septa.
- The pole of 100 mm width should be increased to 200 mm. If the complete system (4 Lambertson septa in a row) could be made more compact (less than 4 m) the pole width could be smaller than 200 mm.
- For a single septum the gap of 30 mm is sufficient.
- Does the twin Labertson septum work when the upper and lower septum has different excitations?

Proposal Twin Lambertson septum





- The required field quality in the range of 120 mm will not be reached with a gap of 30 mm over the 4 m length.
- Suggestion:
 - Decrease gap height to minimum 20 mm.
 - All magnets have the same layout but
 - Each magnet (out of 4) will have his own excitation current.
- All these investigations were done in 2D calculation.