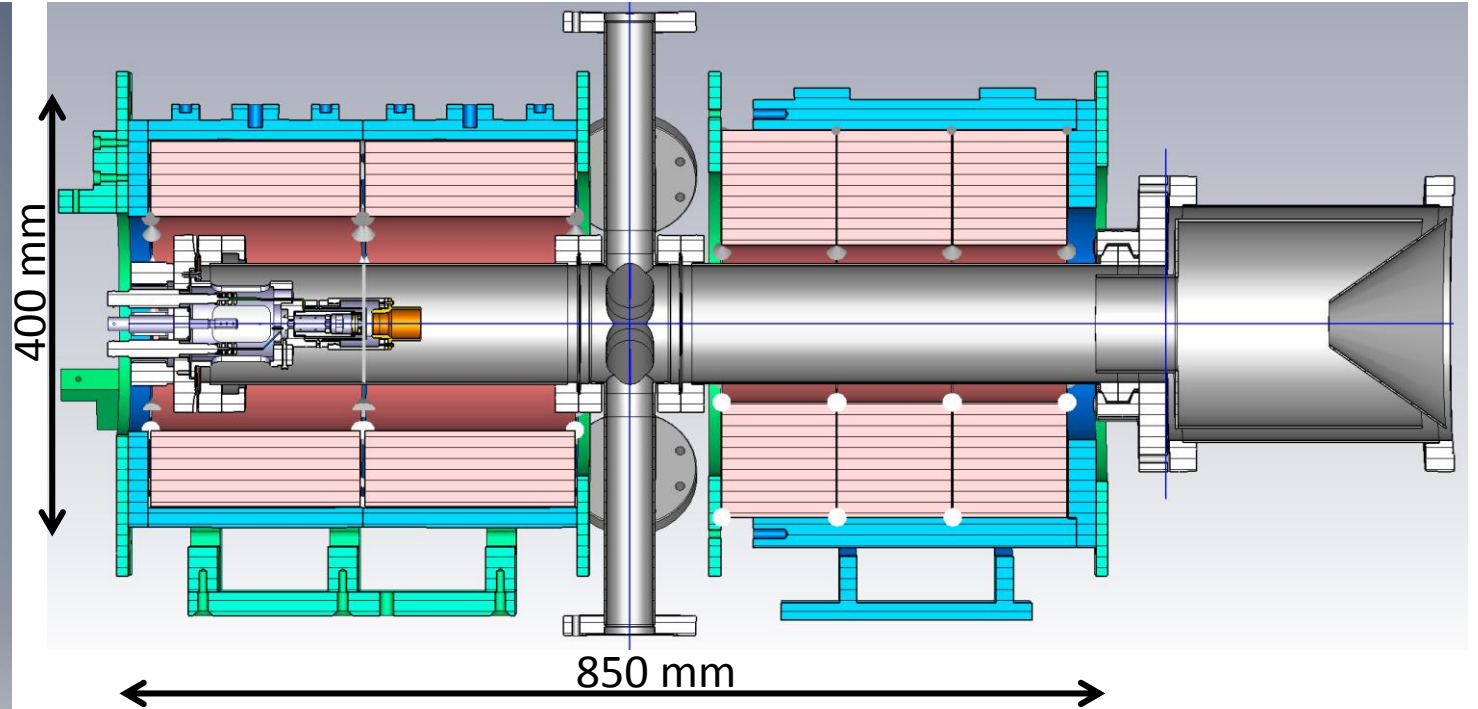
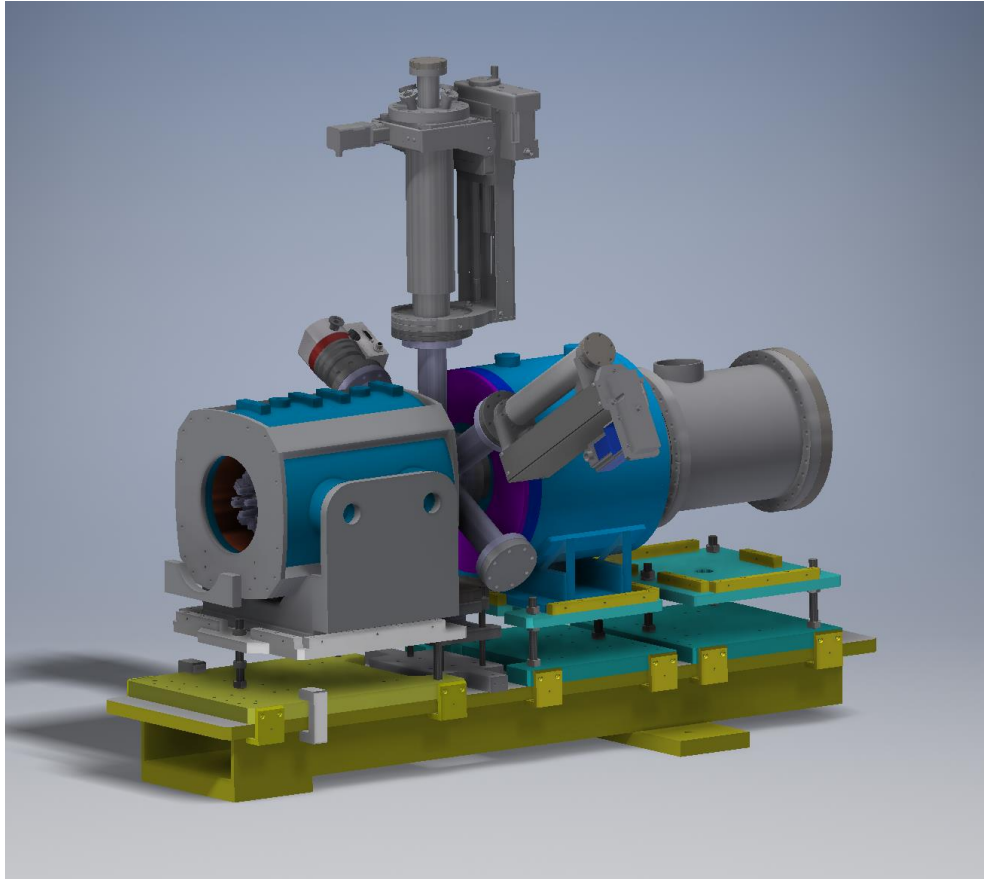


Status of the E-Lens test stand and future plans



E-lens test stand: current status

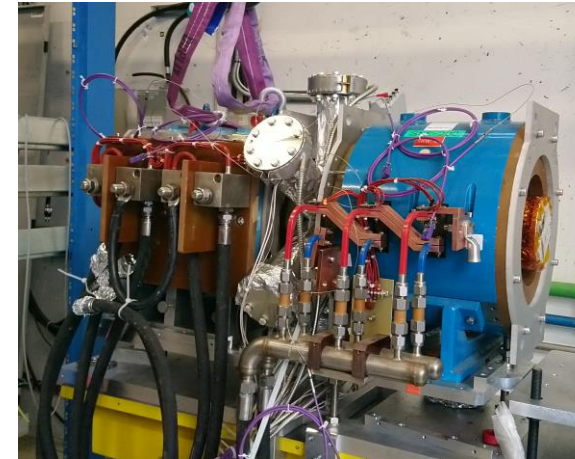
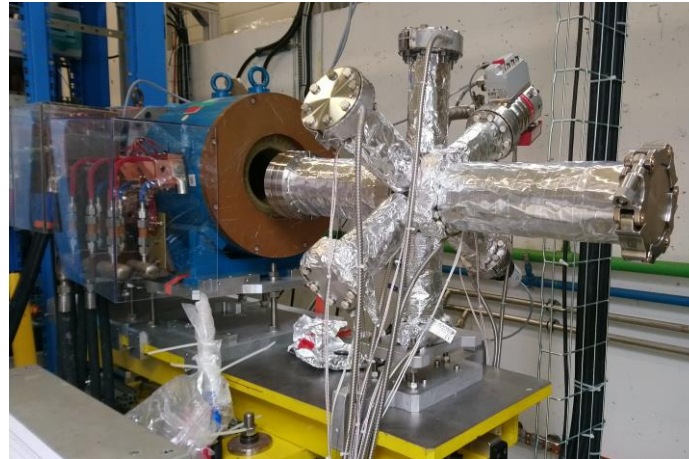
E-Lens Test Stand – current design (Stage 1)



Parameters of the e-lens test stand :

- Gun Solenoid 0.3 T (at 450 A)
- Collector Solenoid 0.45 T (at 450 A)
- Gun acceleration voltage up to 40kV
- Pulsed mode of operation

Current status



June 17-21 – He Leak test is done

June 24-28 – Bake-out is installed

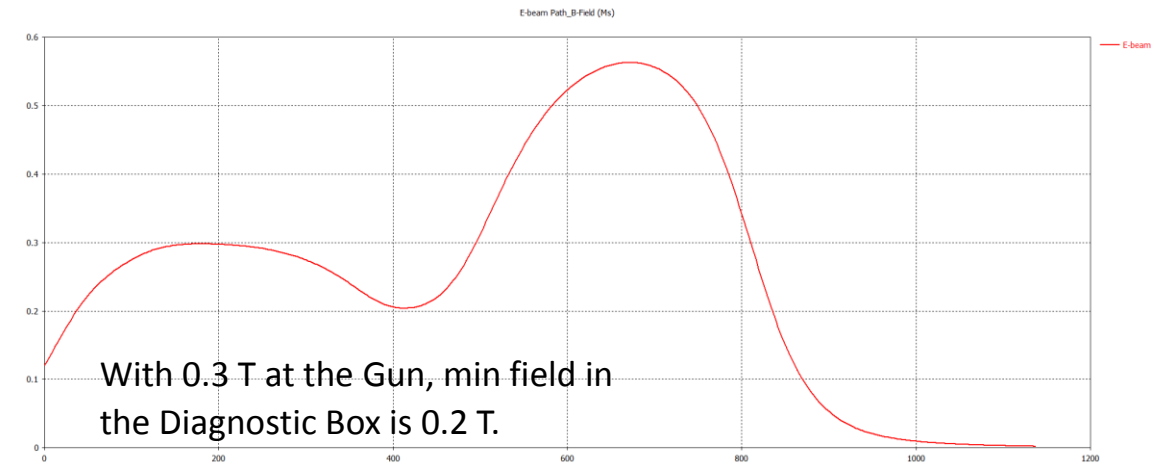
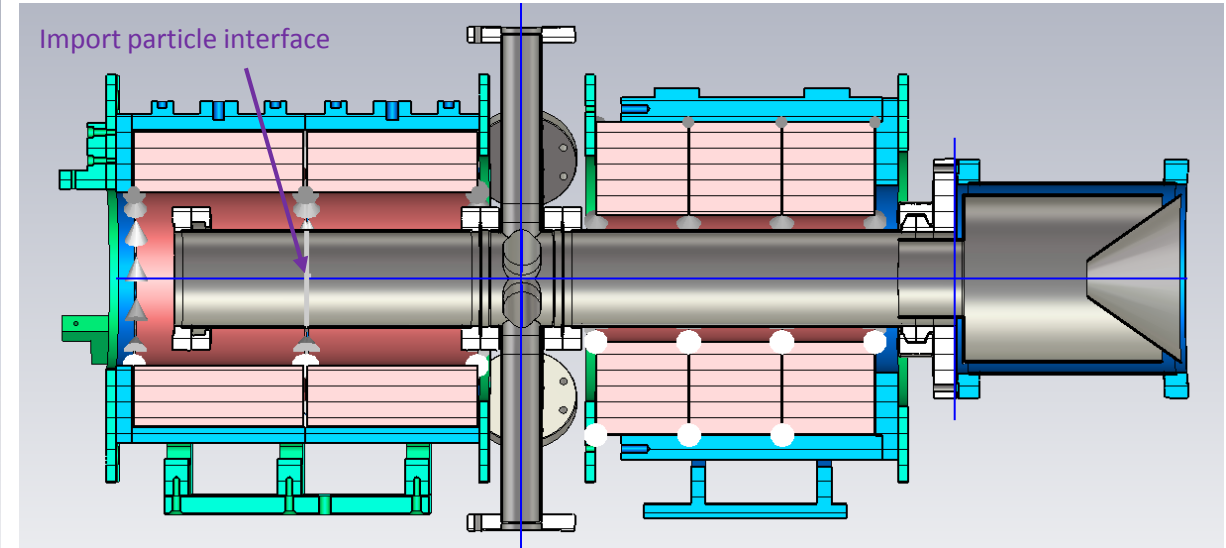
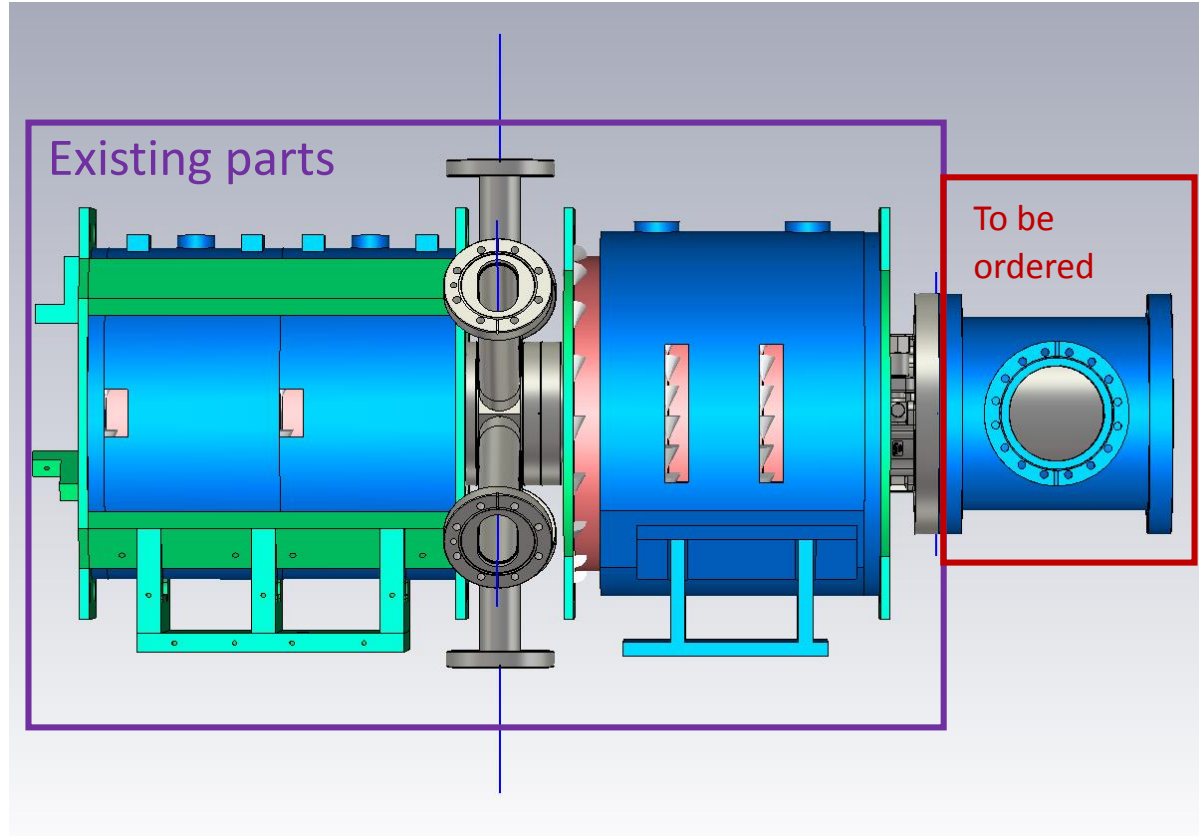
July 01-05 – Final assembling (solenoids, collector FC, diagnostics)

July 08-19 – Gun installation

August –September – commissioning and HEL gun characterization

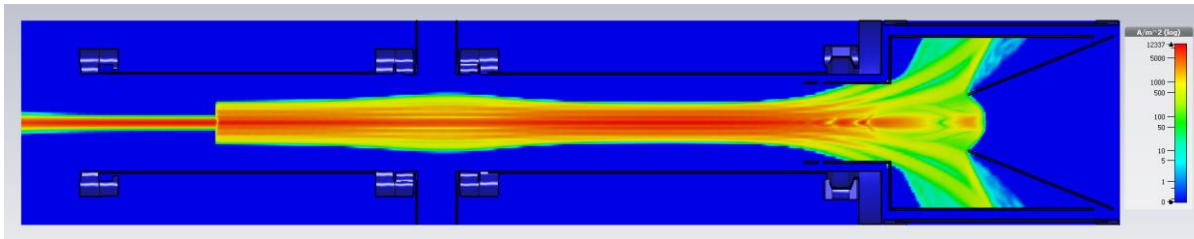
October-December – testing TEL² Gun (in the frame of the ARIES project)

E-lens test stand: collector

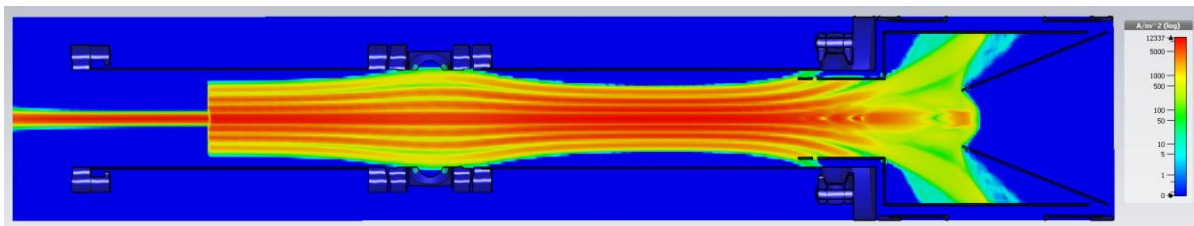


E-lens test stand: collector and BDB

- Particle current density (note: log scale):
X-plane

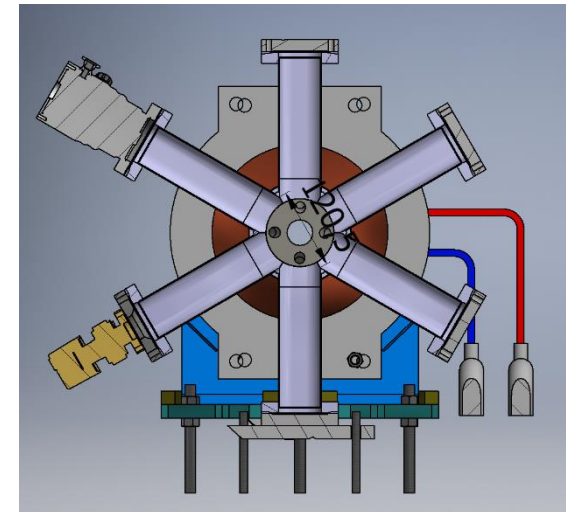
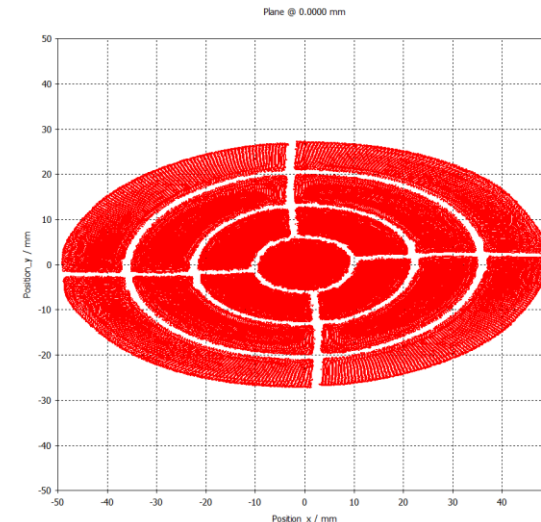


Y-plane



- Collector region:
- Viewport is safe
- 4% of the particles are reflected back to the gun.
- 1 % of the particles hit the vacuum chamber in this region:

- Diagnostic box region:
Beam cross-section in the diagnostic box and cross-section of the Diagnostic box is shown in the Figure below. Due to geometry of the “arms”, diameter of the diagnostics box changes from 100 mm (entrance and exit) to 120 mm (middle), so beam with diameter 100 mm does not hit the vacuum chamber.



TBD:

Radial component of the velocity of the electron beam depends on the magnetic field in the Gun region (higher magnetic field – lower radial component).

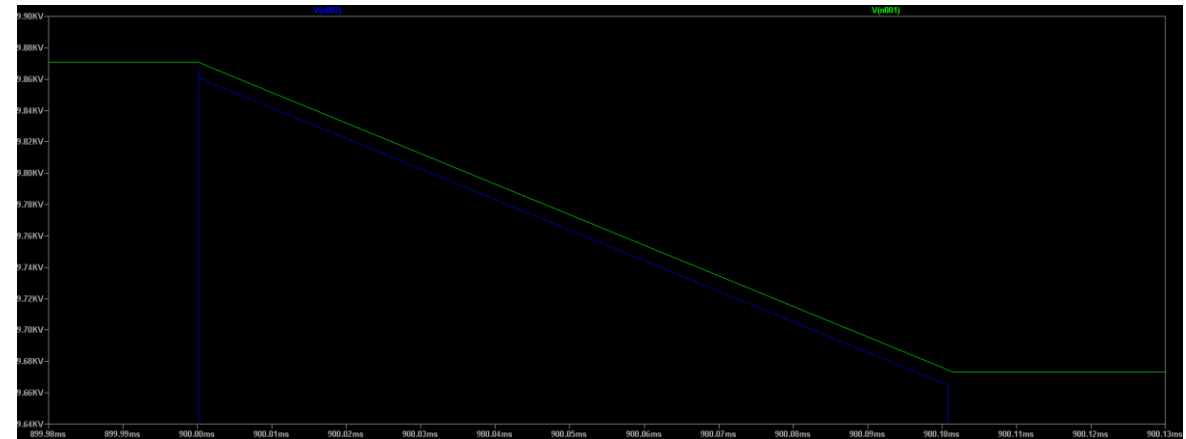
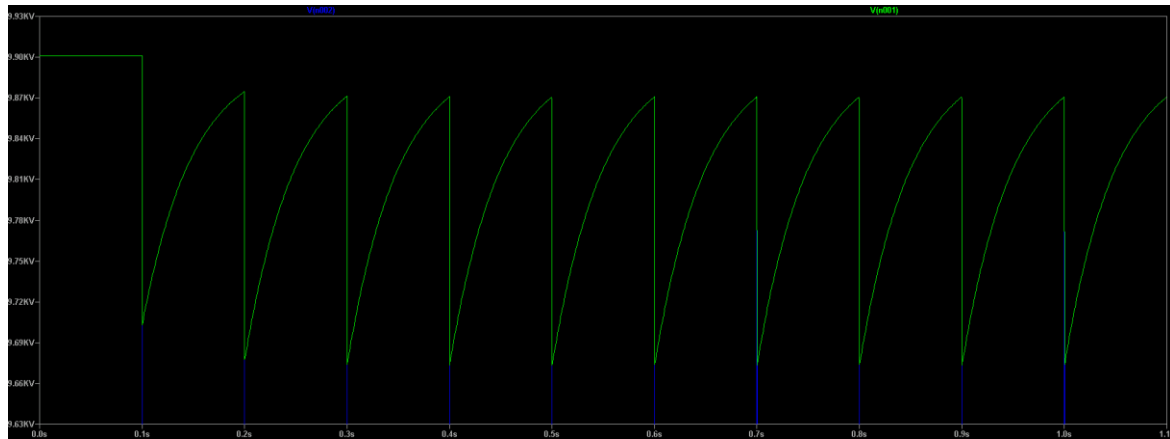
- What initial magnetic field was used to generate particle interface I've used?
- Can we repeat calculation using particle distribution with 0.2T – 0.3T initial magnetic field?

E-lens test stand: planning and measurements

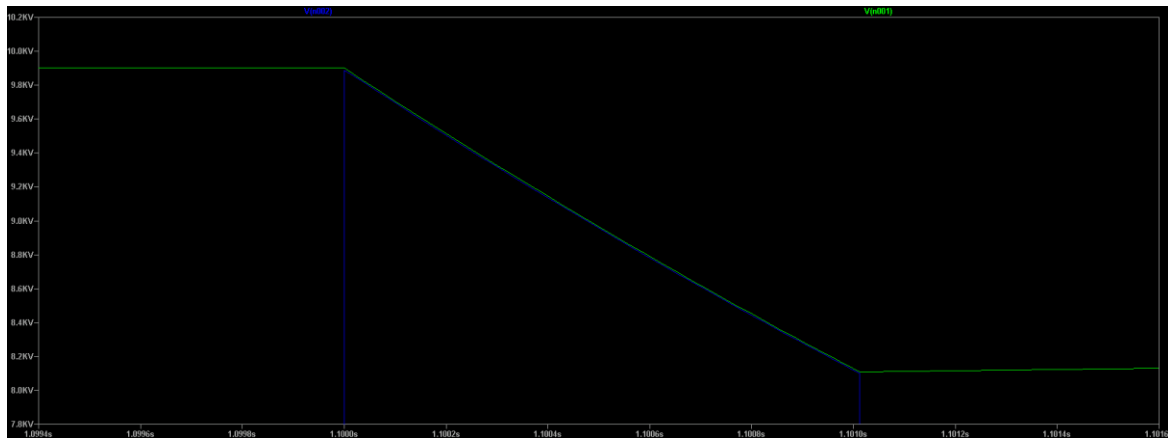
E-lens test stand: planning

[illegible]

E-gun: beam stability

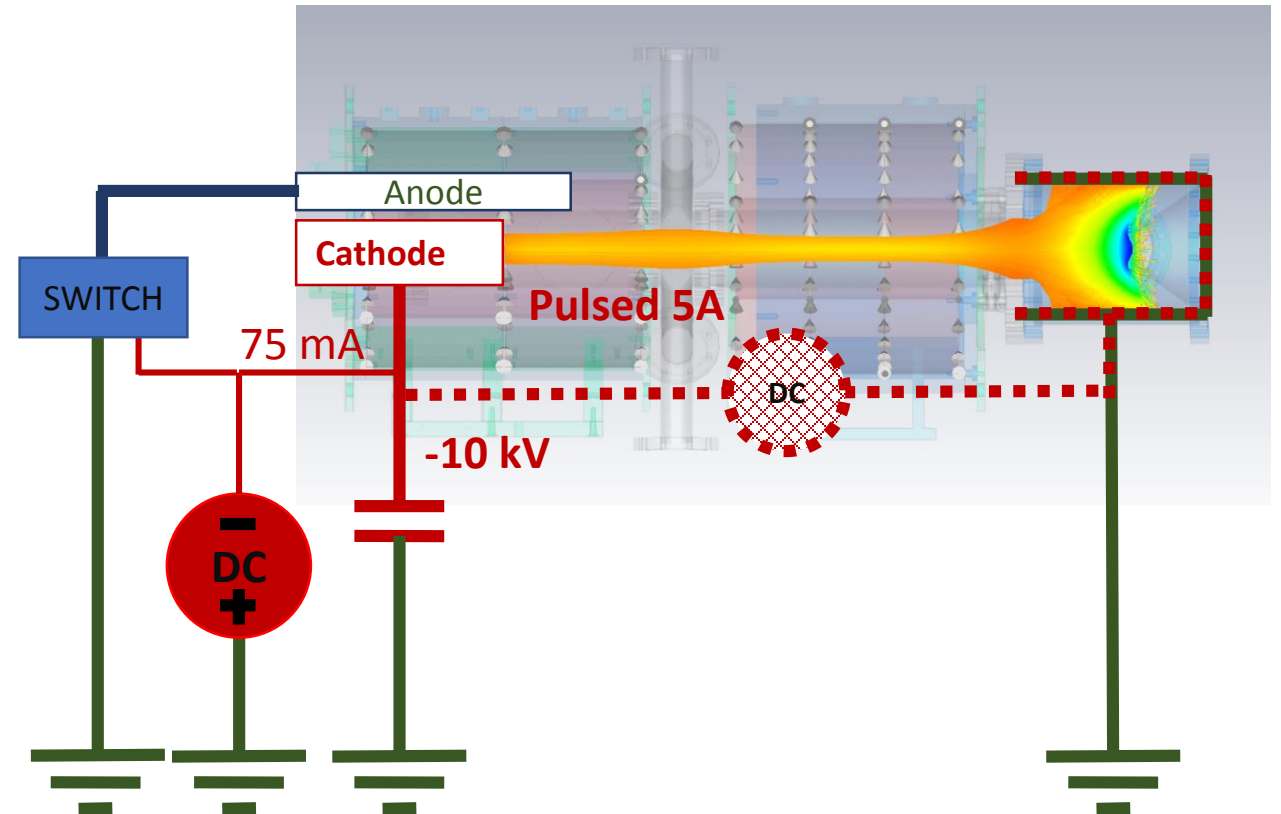
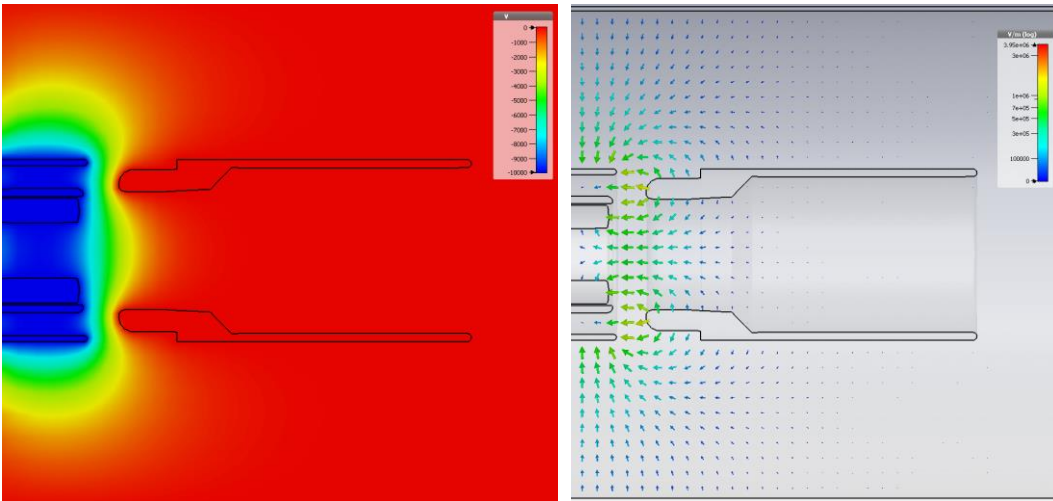
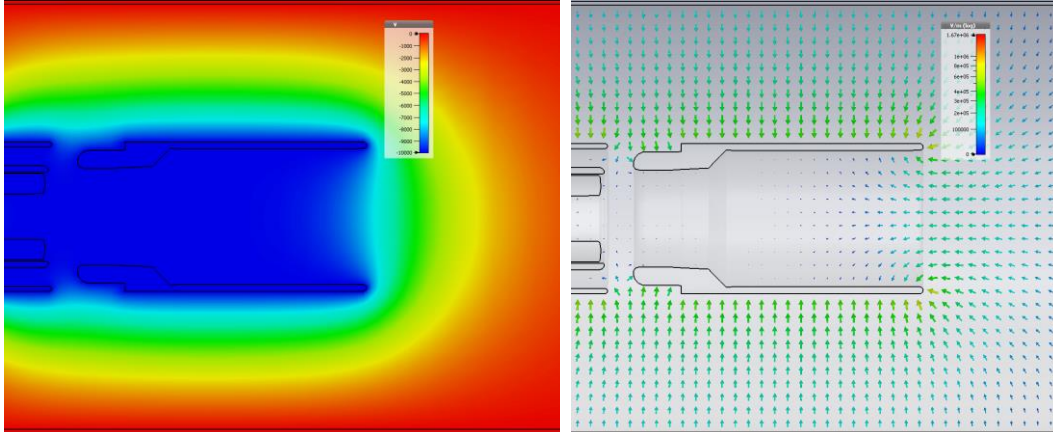


100us at 10 Hz



1ms at 1 Hz

E-gun:



Notes:

- Absence of a HV platform so no possibility of biasing the collector
→ Beam dumped onto passively cooled FC – limit maximum power to 10W
For ex.: beam pulse 10kV x 5A x 200us equivalent to an average current of 1mA
- Energy not recuperated → charge-discharge of pulse generator capacitor – limit of the capacitance which reflects into non constant extraction voltage (beam energy and current)
- Upgrade of FC collector with possibility of biasing + HEL collector