

ELENA source - shutdown plans



1. Addition of puller electrode at ground potential

Goal: Mitigate slow beam movements

HV insulator

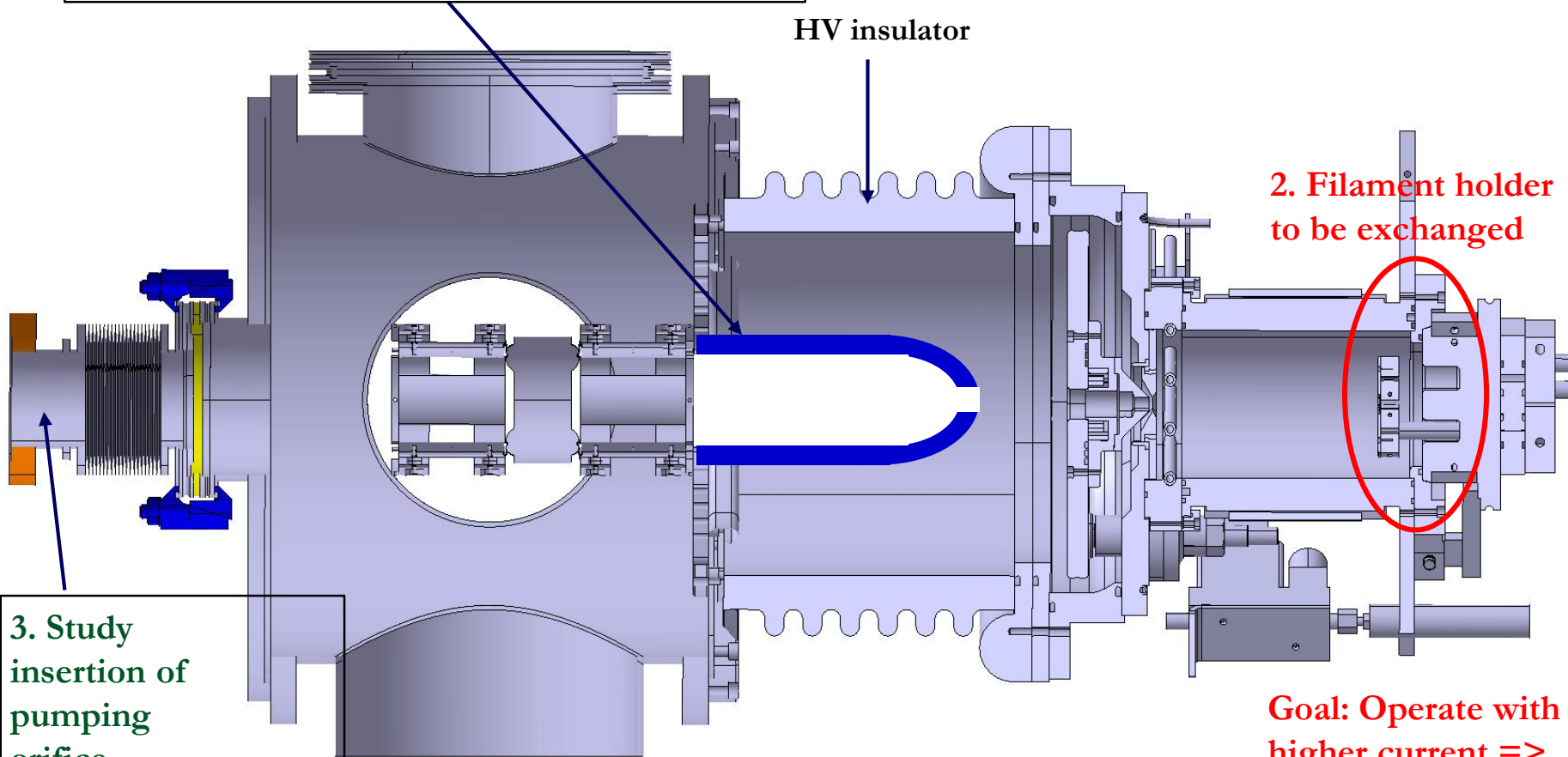
2. Filament holder to be exchanged

3. Study insertion of pumping orifice

Goal: Reduce gas loading into the ring

Goal: Operate with higher current => more stable source

Parts provided by Forschungszentrum Julich,
Ralf Gebel





**4. Addition
mechanical support**

**Goal: Facilitating
access and
maintenance of the
source**

Selection of other tasks

**5. Inventory and arrangement
of spare parts (mechanical,
PSU and PLC modules)**

**6. Consolidate the PLC
software to handle interlock
interruptions correctly**

**7. Install new analogue-optical
transmitters at HV cage;
protect from HV sparks**

**8. Tests spare HV transformer
in the oil tank**

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Detailed planning

1. Inventory of spare PLC units, Mon 15/11 – BL
2. Complement missing PLC units, when point 1 done – MON
3. Select and order transport of two cupboards from bat 133 to the ELENA ring (exact location tbd), asap – CM
4. Check model numbers for the two roughing pumps and the turbo pump, Mon 15/11 – FW
5. Verify the functionality of the spare turbo pump and controller, until end of Feb 2022 – VacMac
6. Exchange oil in the two roughing pumps and the 2200 l/s turbo pump, before end of Jan 2022 – FW arranges
 - a. Oil from Alex Sinturel
 - b. AL40/30 or VacMac
7. Prepare for modification of HV insulator, week 15/11 – FW, CM, BL
 - a. Clear the space around the quadrupole vacuum chamber
 - b. Remove the KF to CF transition/bellow piece
 - c. Remove the large flange in front of the
8. Mechanical support for HV cage, from 16/11 – CM
 - a. Wood mock-up for exact dimensions
 - b. Produce metallic support plate etc
 - c. Installation by Fri 26/11
 - d. Final adjustment Mon 29/11
9. Transmission of HV pulse signal to control system, from 15/11 – FdL, MON
 - a. Investigate if we can invert the resistor chain so the measuring point is close to gnd potential instead of at -100 kV
 - b. If not possible, install a low bandwidth transmission channel from HV rack to gnd
10. High bandwidth transmission channel from HV cage to ground, from 15/11 – FdL, MON
 - a. Install newly purchased unit
 - b. Protect +24 V and signal input from overvoltage sparks
11. Exchange filament holder flange for new version from FZJ, week 29/11 – Julich team, CM
12. Investigate possibility of installing a pumping orifice at the exit of the quadrupole vacuum chamber, week 29/11 – Julich team, FW, BL, DG
13. Install protection of HV insulator, from week 29/11 – Julich team, CM, BL and FW
 - a. Take out quadrupole doublet
 - b. Install puller (prepared by Julich) at the end of the quadrupole doublet
 - c. Reinstall the assembly inside vacuum chamber
 - d. Close up vacuum system and restart pumping
 - e. Perform HV conditioning of the system, aim to be ready before Christmas
14. Consolidate the PLC software to handle interlock interruptions correctly, from week 29/11 – FG, DG
15. Tests spare HV transformer in the oil tank near the source, week 24-28/1 (tbc) - CrM

For February or later

16. Send +110 kV FuG supply to manufacturer for reconfiguration to -110 kV
17. Test Hungarian 400 Hz HV insulation transformer at CERN (pending manpower and time)

Name assignment tentative

MON – Michael O’neil
FdL – Francesco di Lorenzo
CM – Cristiano Mastrostefano
BL – Bertrand Lefort
DG – Davide Gamba
RG – Ralf Gebel
FW – Fredrik Wenander
CrM – Christophe Machado

Input / assistance from Alexandre Sinturel for vacuum related issues

We will not:

- * Take apart the source to exchange o-rings; should ideally be done every 4-5 years
- * Remove the HV cage around the source
- * Exchange the plasma electrode orifice from 4 to 6 mm diameter
- * Go back to original (single) magnet dump configuration

Time window:

- * Start 15/11
- * Aim to be finished end of January

Uncertainties:

- * Mechanical incompatibility of newly produced ground puller for the protection of the HV insulator
- * Excessive dark current with new puller installed
- * Time to condition the source; number of placement iterations of the new puller