

Test stand description and  
parameters clarification.

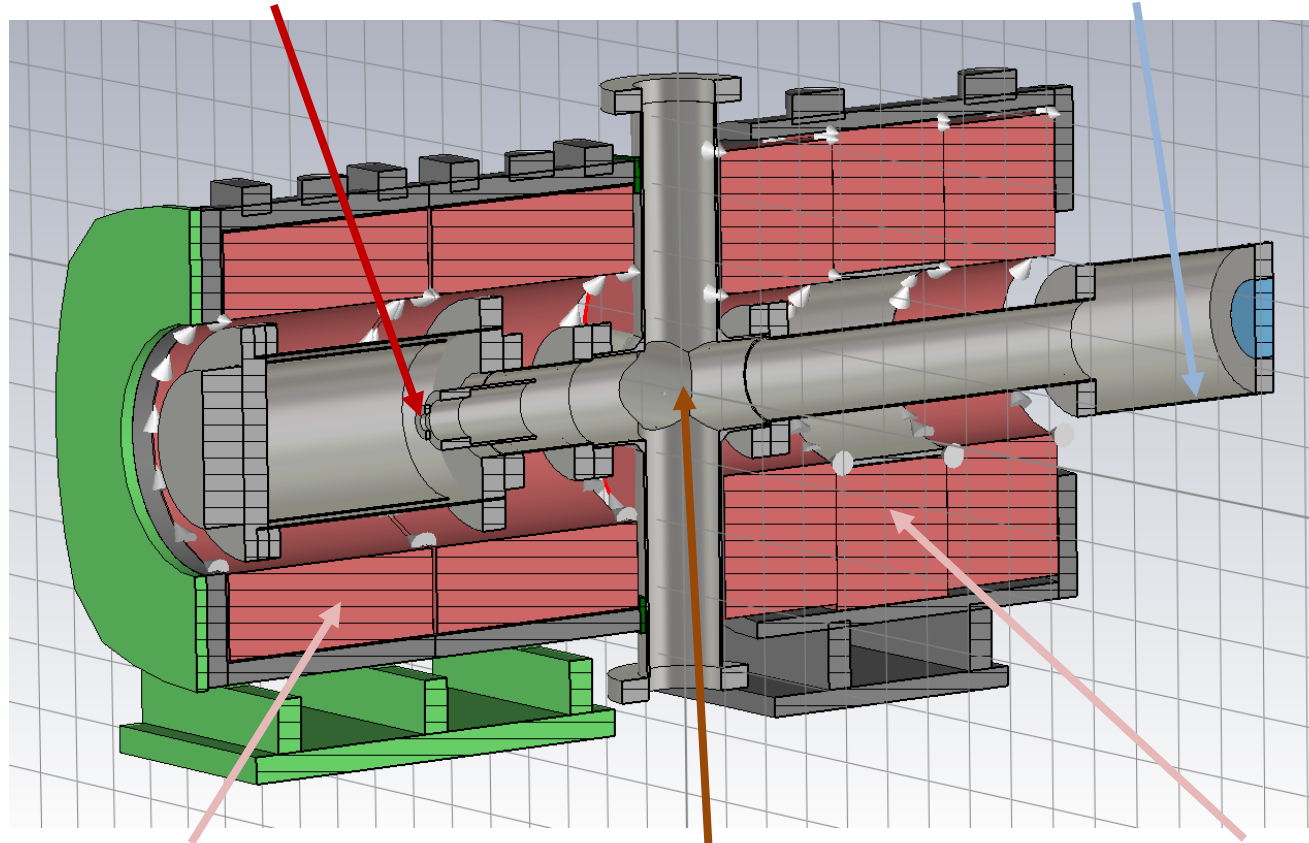
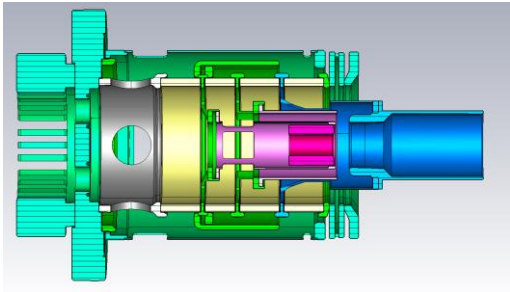
# Outline

- Current design of test-stand overview:
  - Current status
  - Future upgrade
- Discussion:
  - Beam parameters:
    - Size - vacuum system
    - Pulse structure
    - Current
    - Energy
  - Planned measurements to be performed
  - Requirements for beam diagnostics:
    - Beam profile (YAG screen, pin-hole Faraday cup)
    - Beam current (FC, current transformers)
    - Longitudinal beam pulse structure (resolution)

# Current design overview

Cathode of the electron - gun

Collector / Faraday cup



Gun solenoid

"Diagnostics box"

Collector solenoid



# Purposes

- Test bench for tests electron guns and instrumentation:
  - Development and commissioning diagnostics tools and procedures for beam parameters measurement (current, profile, energy distribution)
  - Safety and technical aspects of operation
  - Commissioning HV system
  - Electron gun tests
  - Tests with Beam Gas Curtain monitor



# Timeline:

Delivery time for several critical components (XYZ scanner for pinhole, HV pulse generator, ...) is 16 weeks. Time for commissioning and integration should be taken into account.

Building preparation (water cooling system, power, HV safety) will require around 6 months.

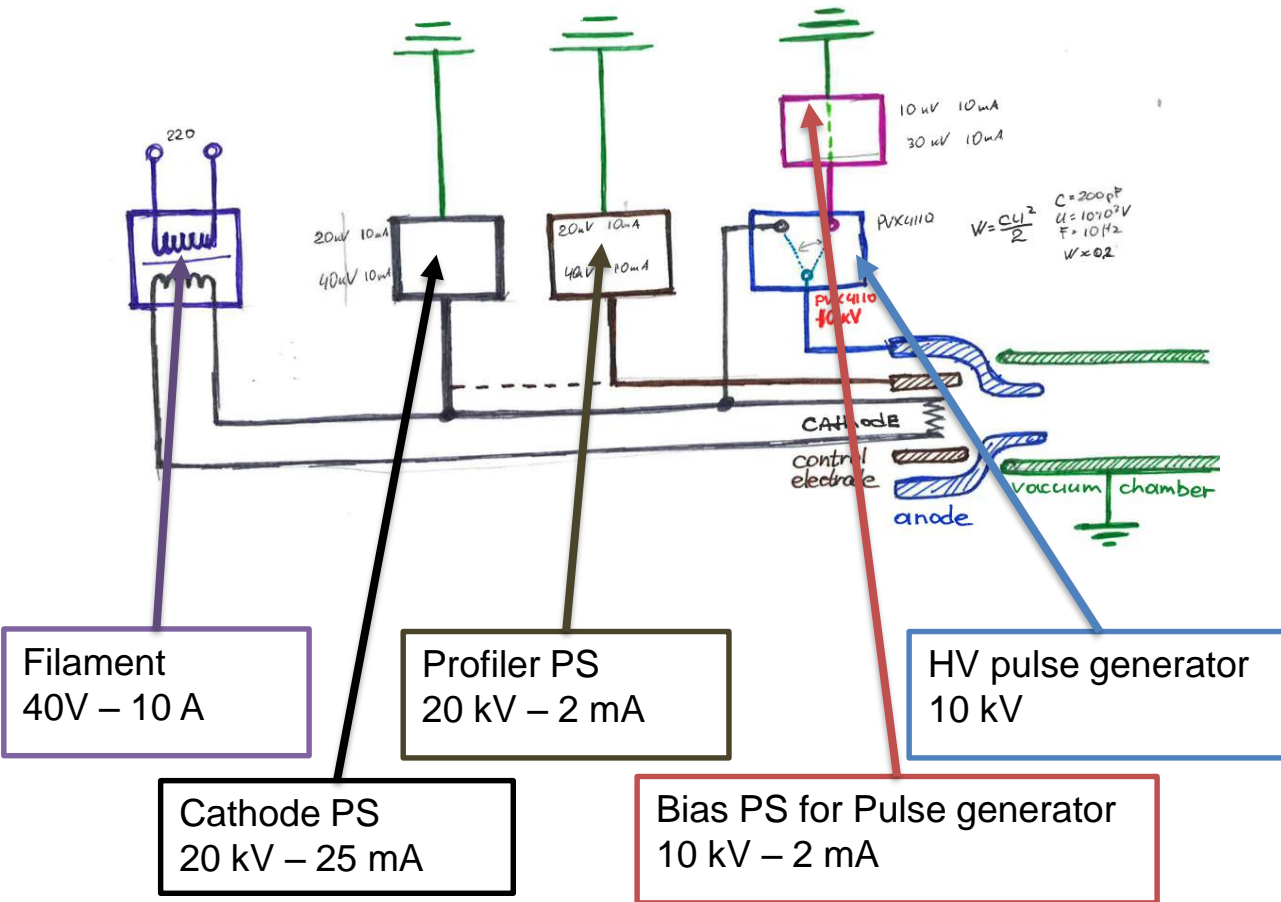
Optimistically in 6 month after ordering all components test bench will be assembled.

Specification of the beam and requirements for beam measurements should be fixed before 11<sup>th</sup> December 2017. **Components must be ordered this year.**

# HV circuit

Current system is designed to use

- pulsed beam for hollow electron gun tests:
  - Extraction potential – 10 kV
  - Electron beam energy – up to 15 kV
  - Peak current – 5 A
  - Pulse length – 10 us
- DC beam (15 kV 20 mA)



## To discuss:

beam parameters

- Pulsed/DC
- Current
- Extraction potential
- Energy
- Frequency (if pulsed)

\* Collector PS will be added with biased collector

\*\* Power supply connections will be reconfigured

# Diagnostics

Diagnostic tools for base-line configuration are installed in the diagnostic box:

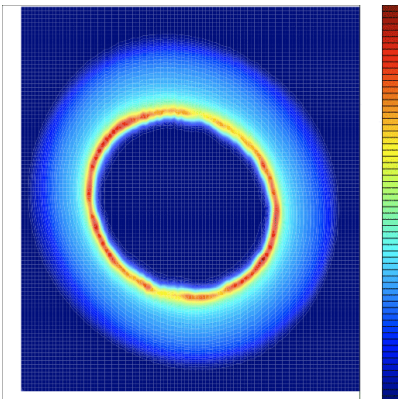
## Profile measurement

XYZ pin-hole Faraday cup  
(profile measurement pixel  
by pixel)

YAG screen (profile  
measurement in one  
pulse)

## Current measurement

Faraday cup (total current  
measurement)





Current, energy, DC/pulsed, length of the pulse

Requirements for the solenoids

Magnetic field

Measurements that are planned to perform on the test bench

Timeline for the beam:

When gun/vacuum system will be ready (necessary for integration)

When measurements are planned to be performed

Requirements for diagnostics:

Profile measurement (YAG screen, pin-hole FC)

Longitudinal resolution for Faraday Cup

To discuss