

# A GaAs photoemission DC gun for CAEP high- average-power THz FEL

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Basel, FEL2014

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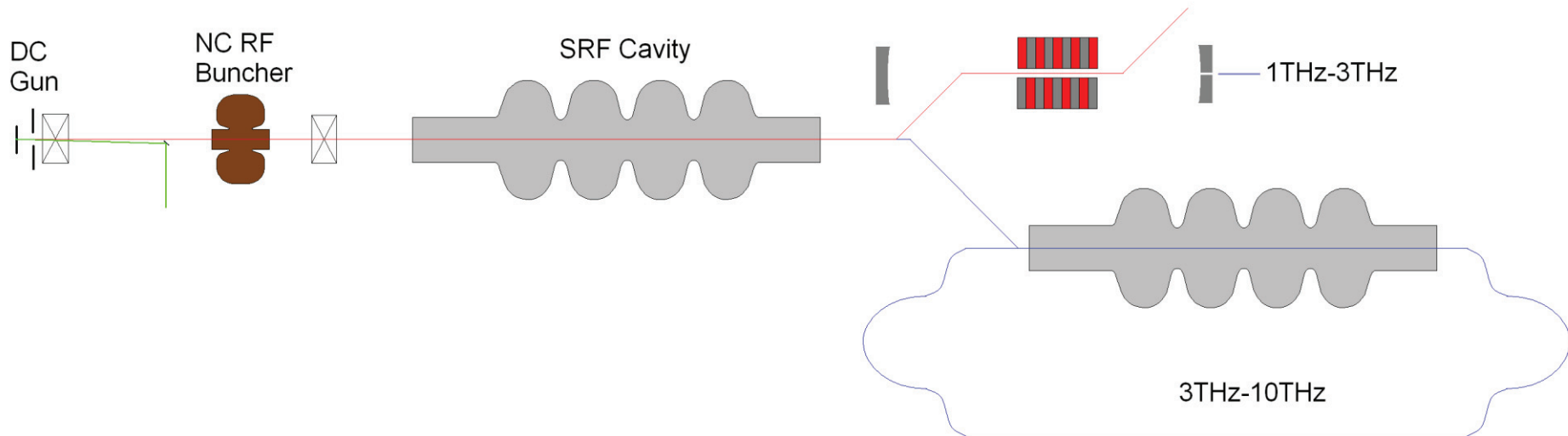
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# CAEP High-Average-Power FEL THz



Average power  $>10\text{W}$

First stage (red axis): 1THz-3THz

Second stage (blue axis): 3THz-10THz

## Scheme of CAEP THz Source

# Load-Lock DC gun

## Introduction chamber:

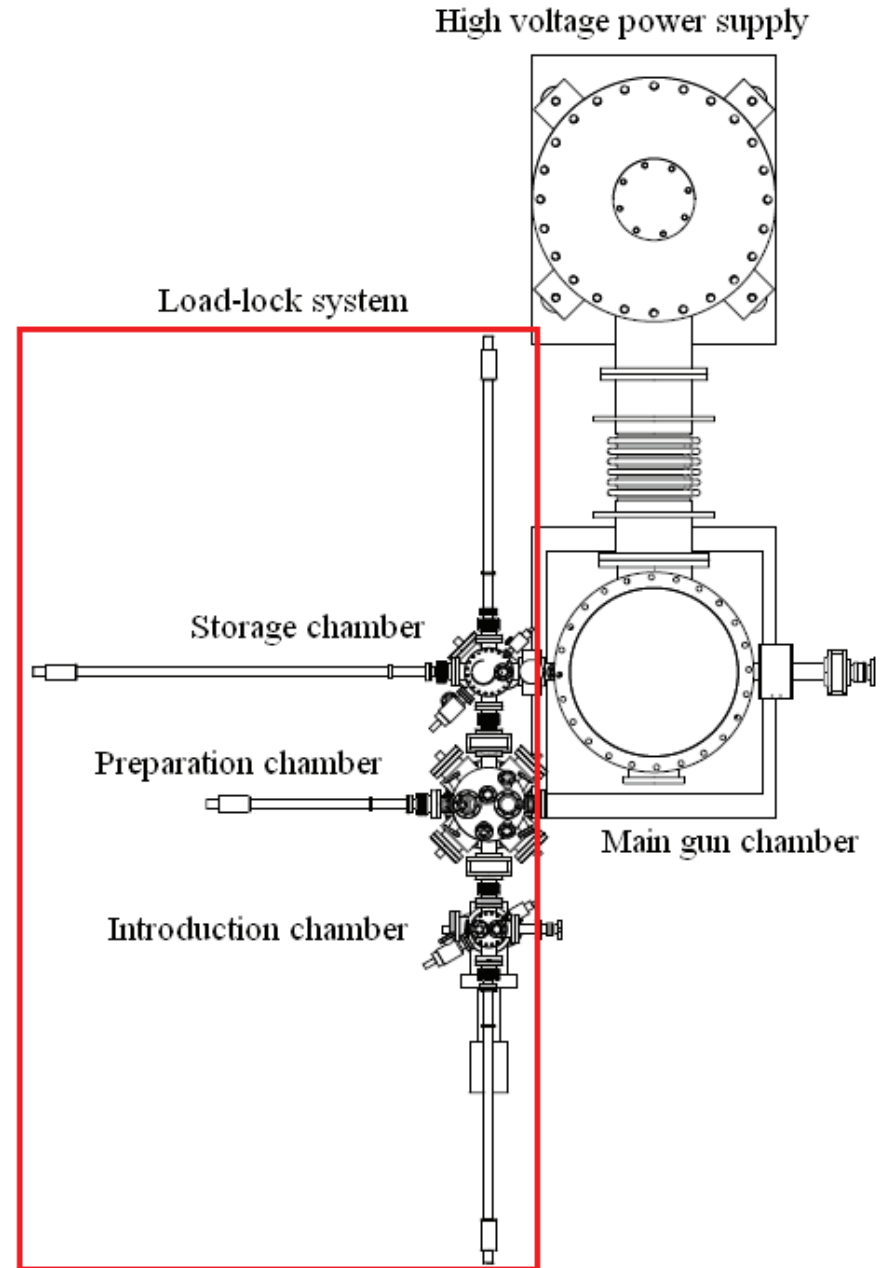
- Introducing cathode
- Atomic hydrogen cleaning

## Preparation chamber:

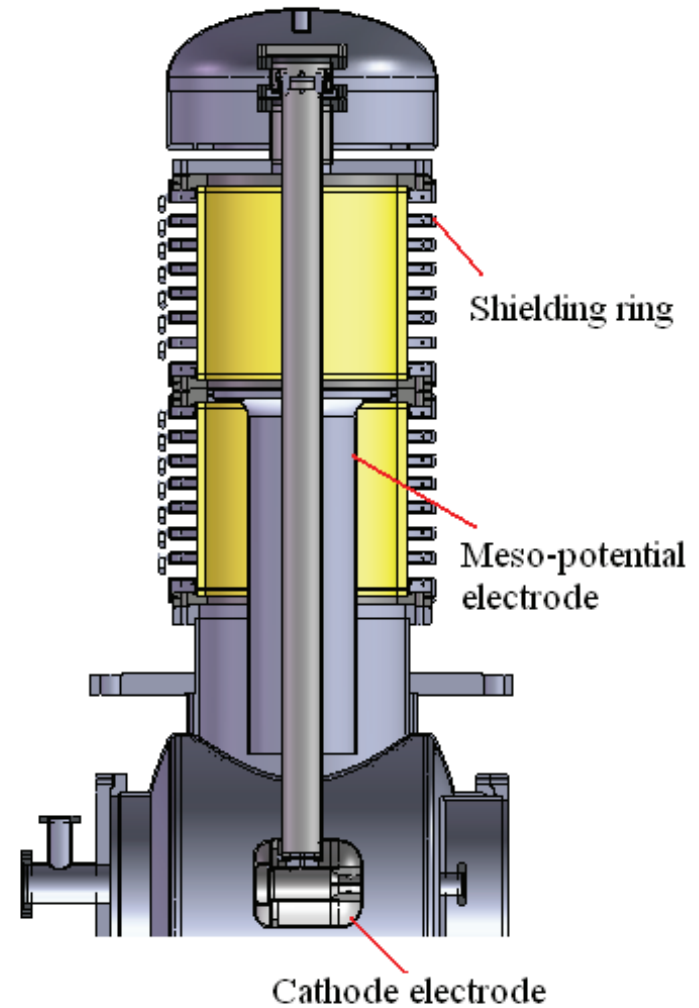
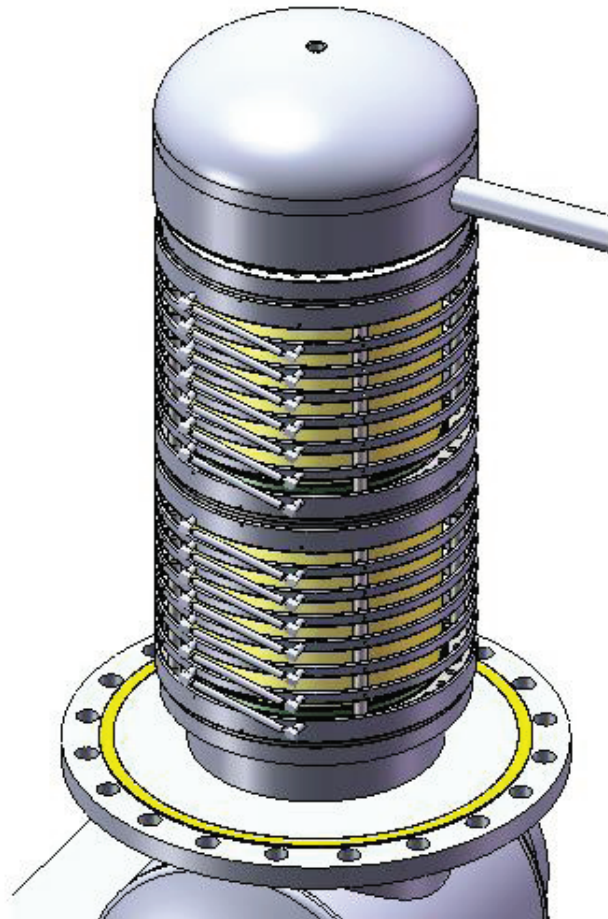
- Heating
- Activation
- Measurements

## Storage chamber:

- Store cathodes activated

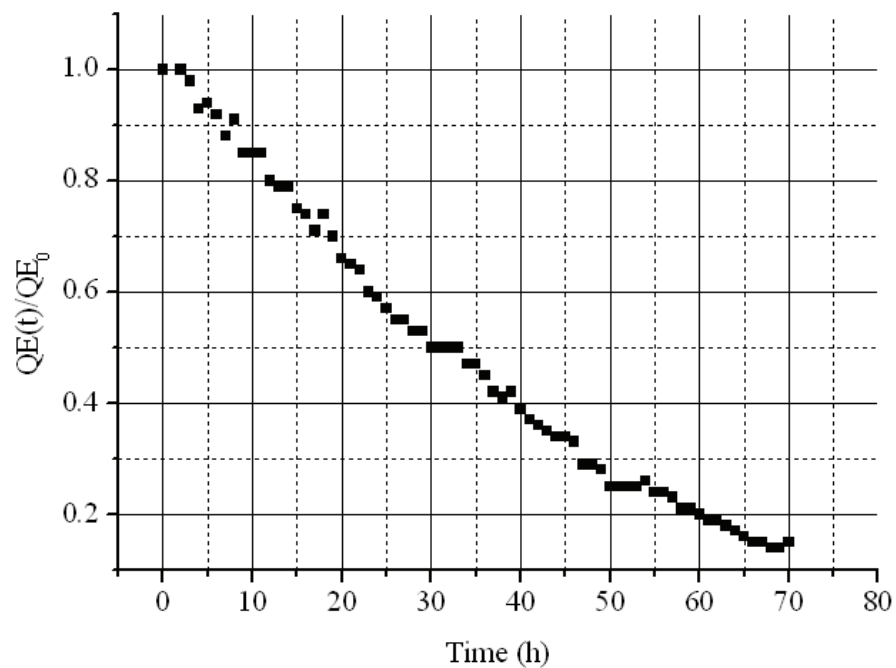


# High Voltage Parts

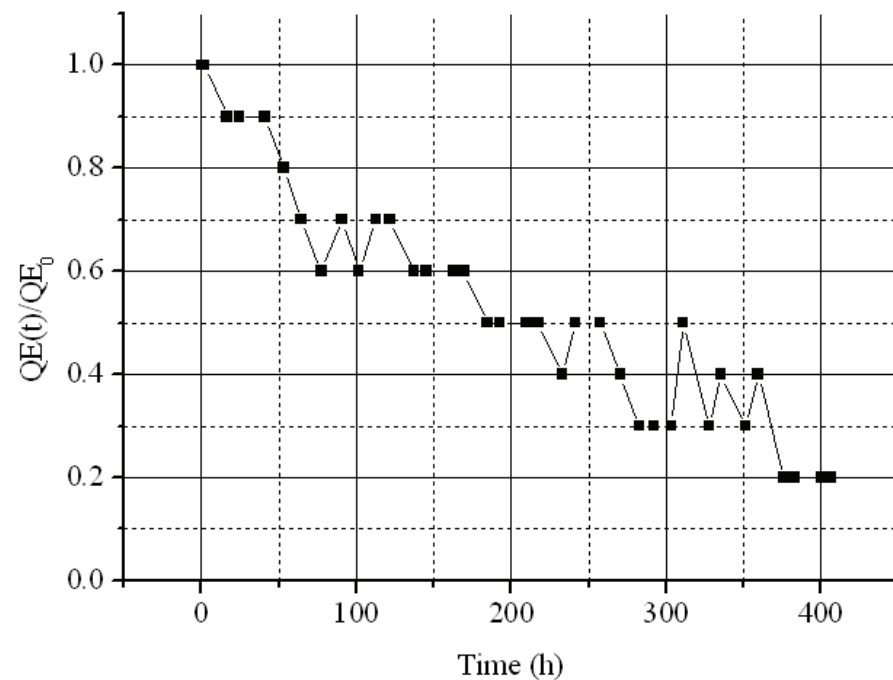


Side and cutaway view of high voltage parts

# Photocathode Darklifetime



**Cs-O activation**



**Cs-NF3 activation**

# Present status

- The gun can operated at 320kV stably, but the current of 5 mA (10ms-long pulse at 10Hz) just continue about 5 hours for poor vacuum of  $1.2\text{E-}8\text{Pa}$ .
- The new gun is debugging based on improved design and will be completed by the end of 2014.
- The vacuum steps up more than an order of magnitude comparing with original gun.



**Thanks for listening**