

# Dynamic Vacuum Meter is at CERN

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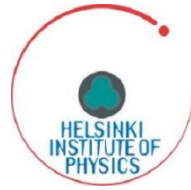
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2) Helsinki Institute of Physics

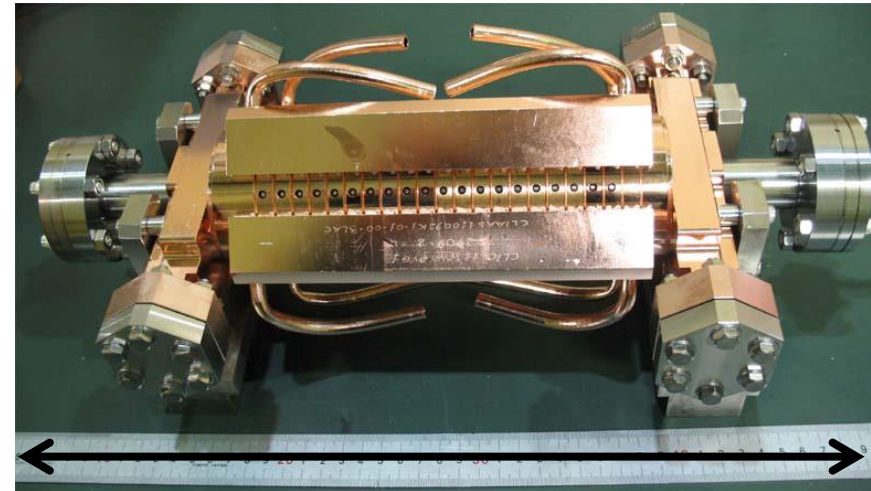
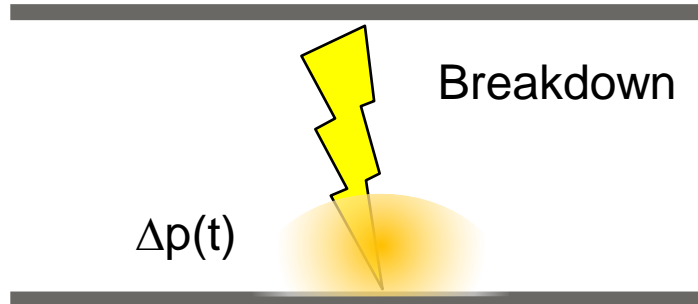
3) CERN



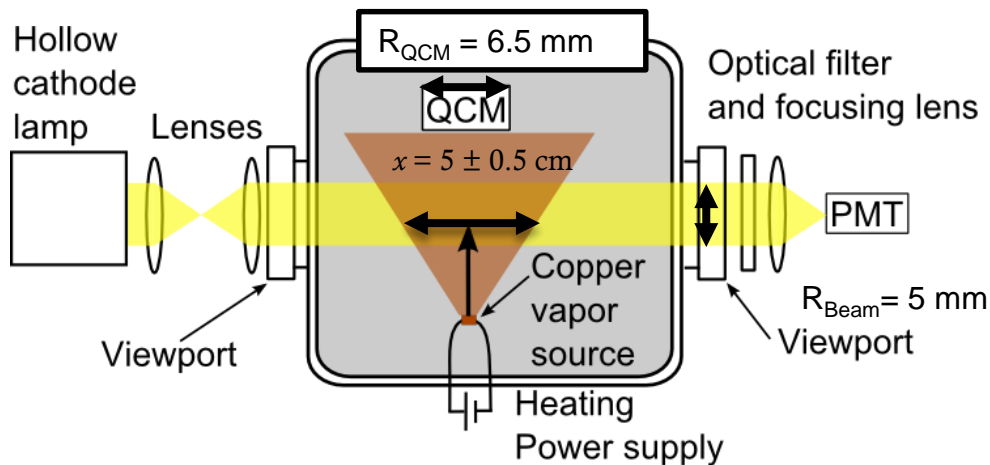
# Dynamic Vacuum Meter



Vacuum tube or AS-element



50 cm



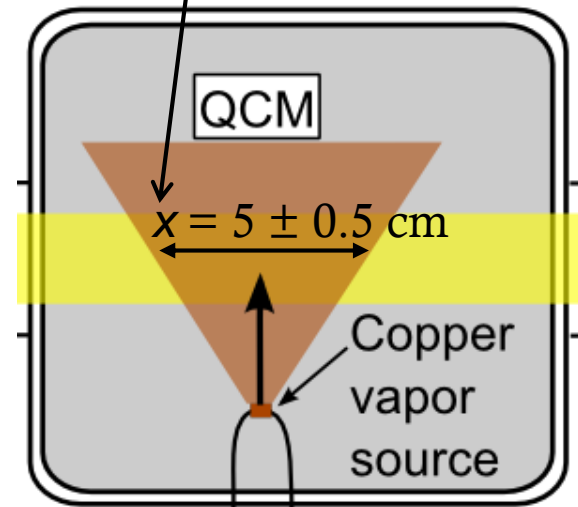
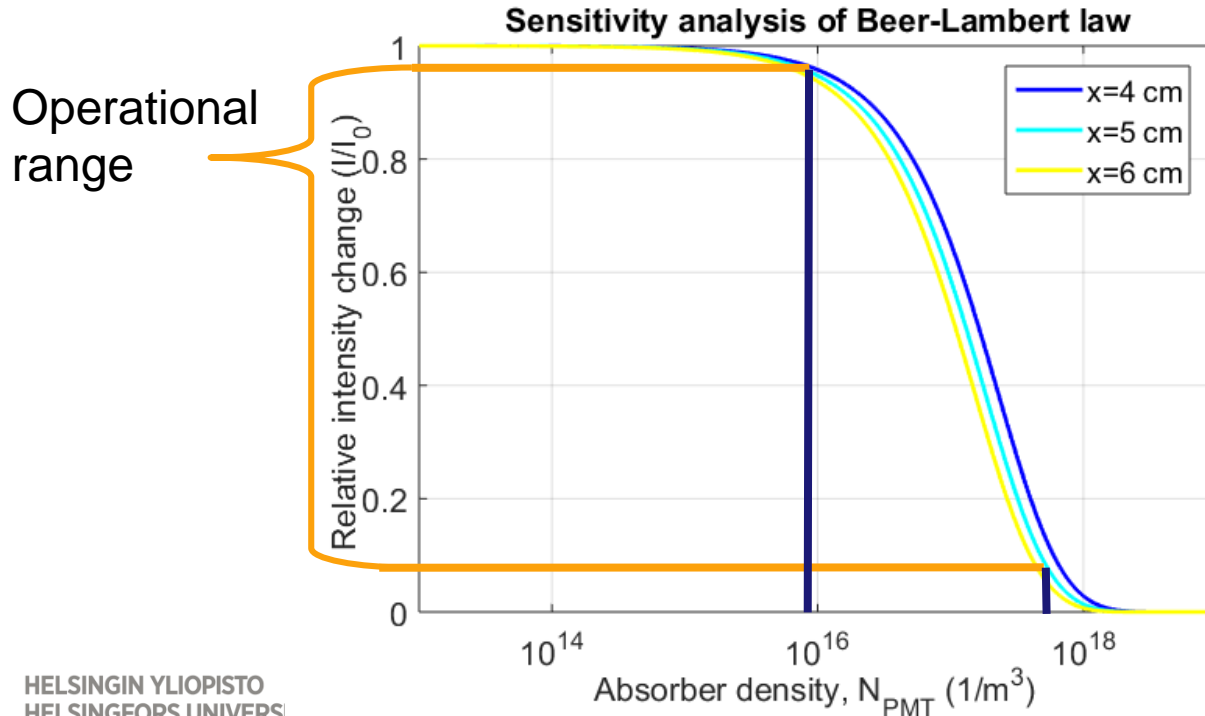
Quartz crystal microbalance (QCM) as reference



# Absorption density

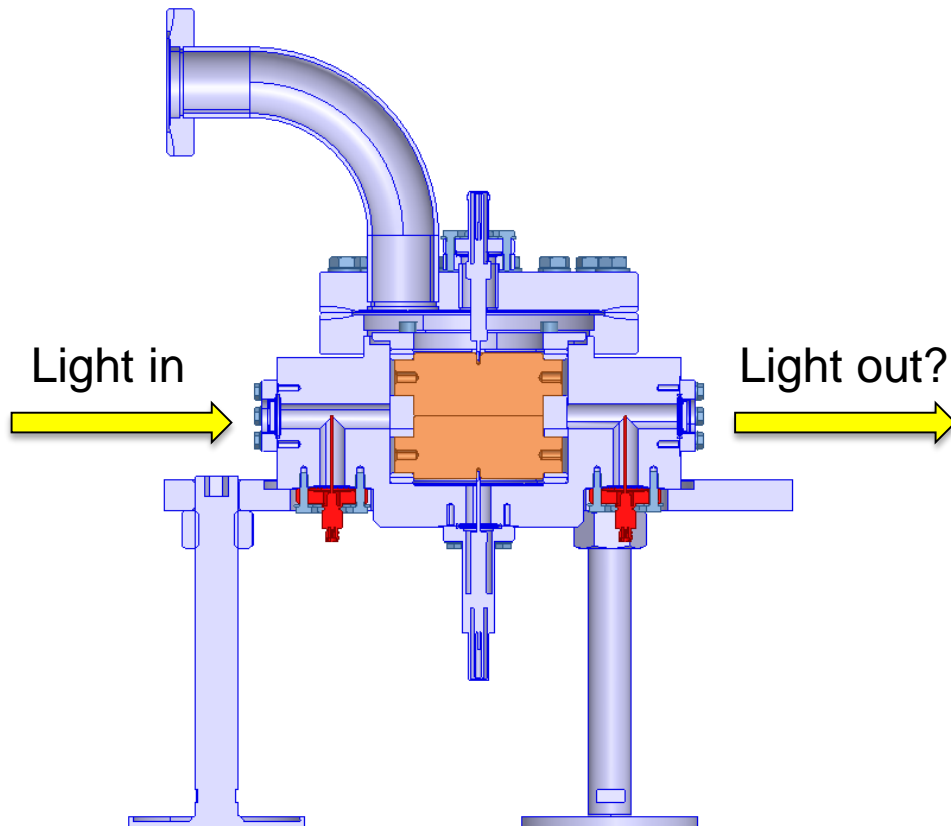
## Beer-Lambert's law (PMT):

$$I(N_{PMT}) = I_{0,325nm} e^{-x\sigma_{325nm} N_{PMT}(\tau)} + I_{0,327nm} e^{-x\sigma_{327nm} N_{PMT}(\tau)}$$



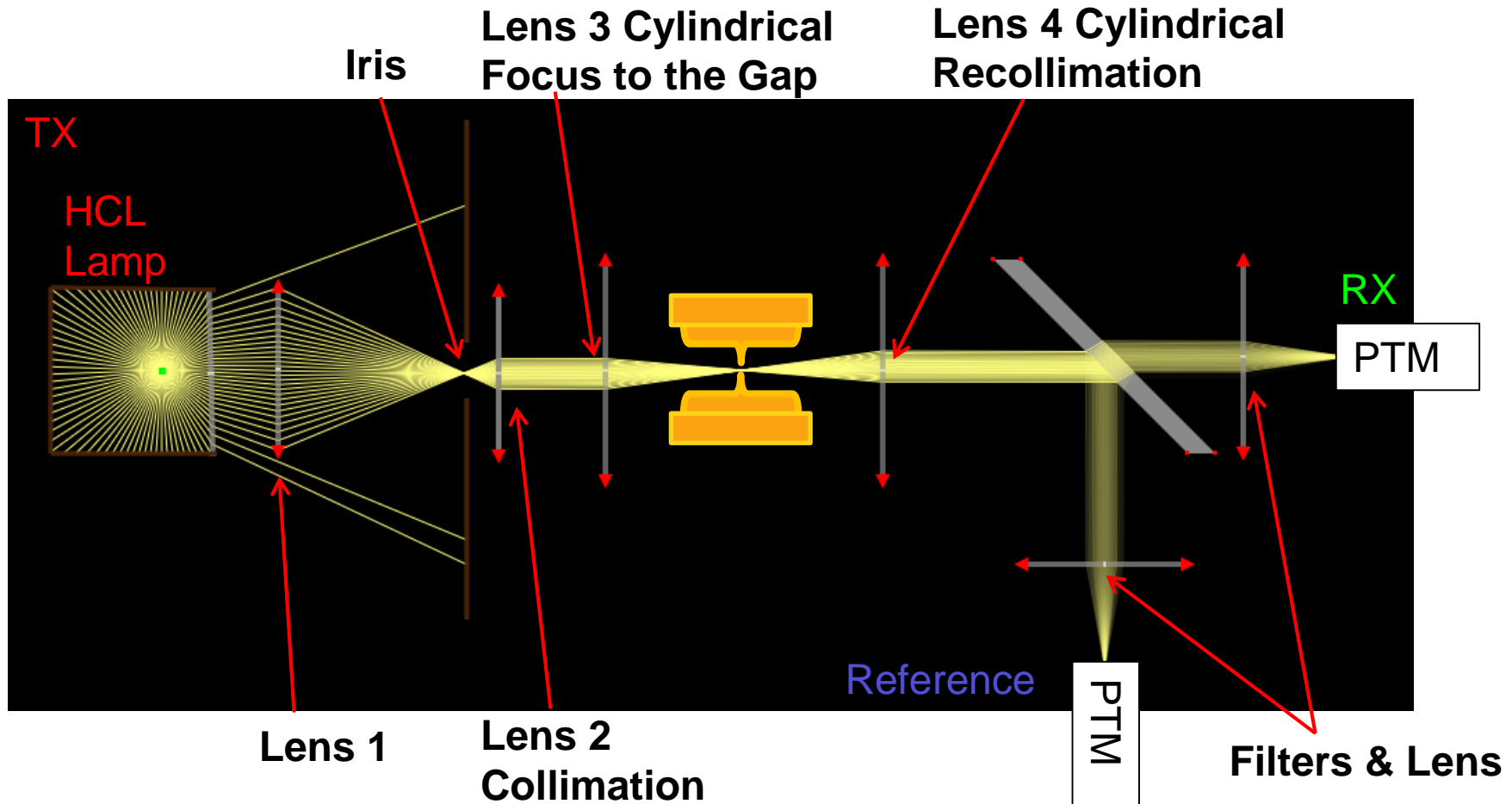
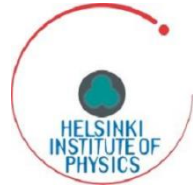


# DVM and DC-Spark

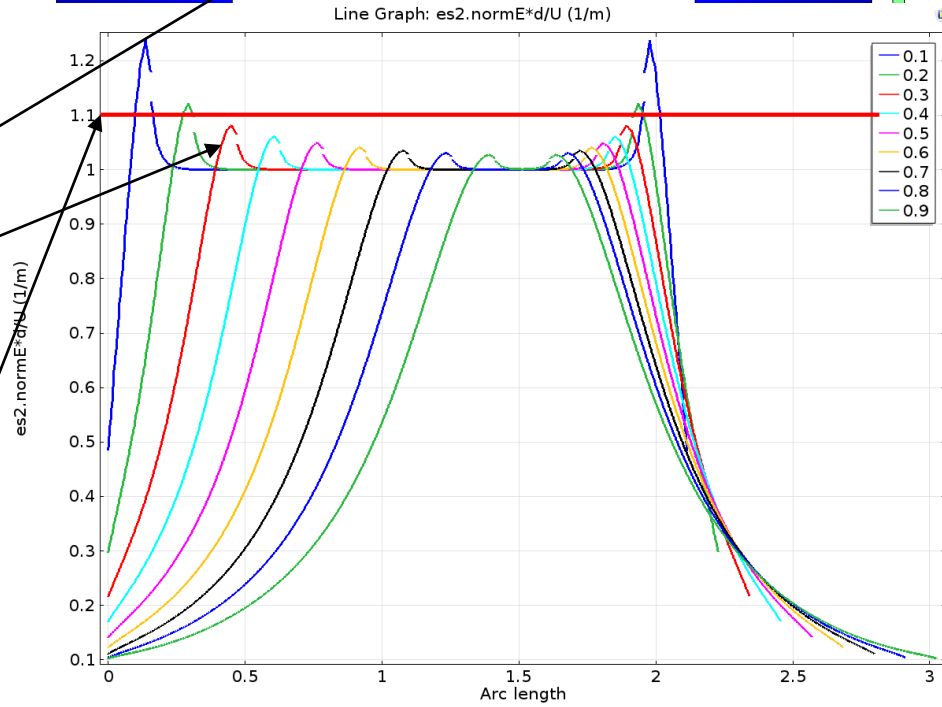
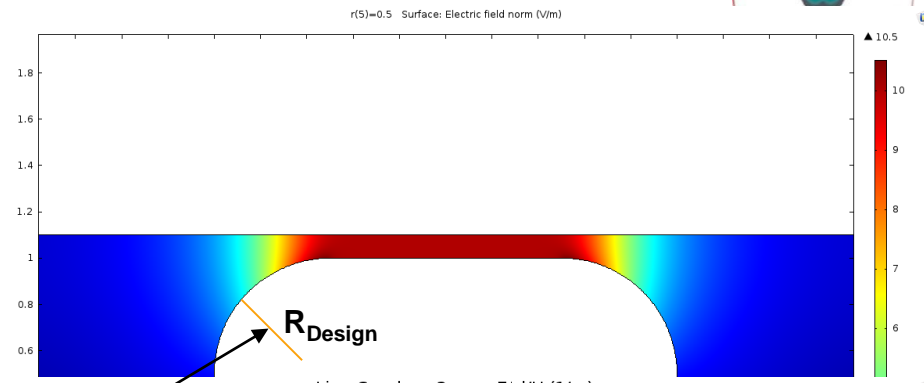
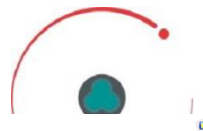
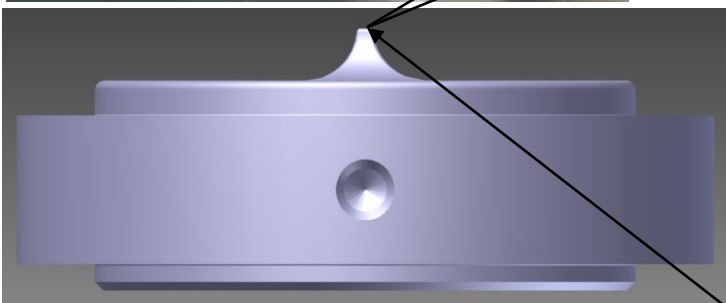
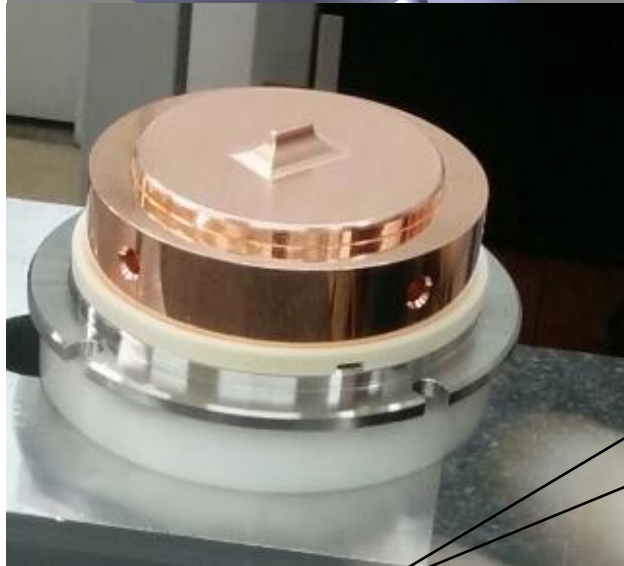
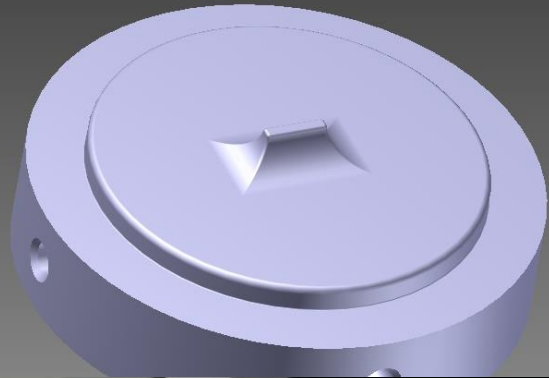




# Optics Simulation



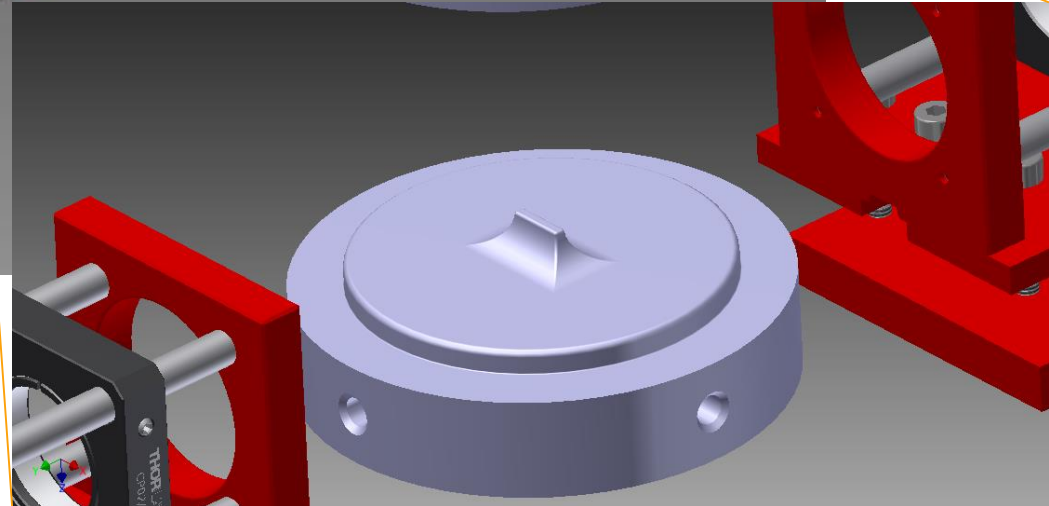
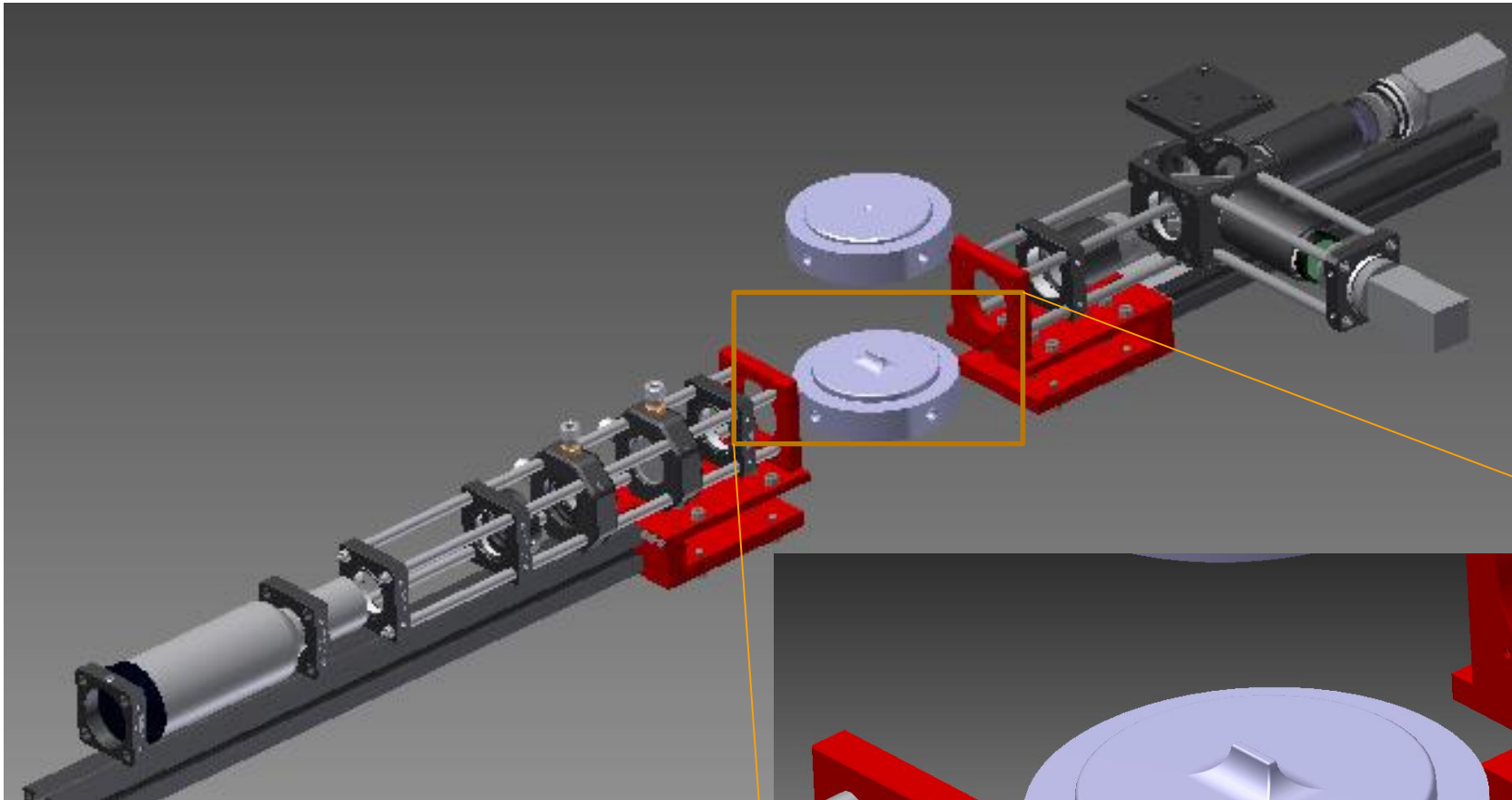
# Electrode Design



For 0.1 mm gap,  $r \geq 0.3$  mm  
 $R_{Design} = 0.5$  mm  $\geq 0.3$  mm

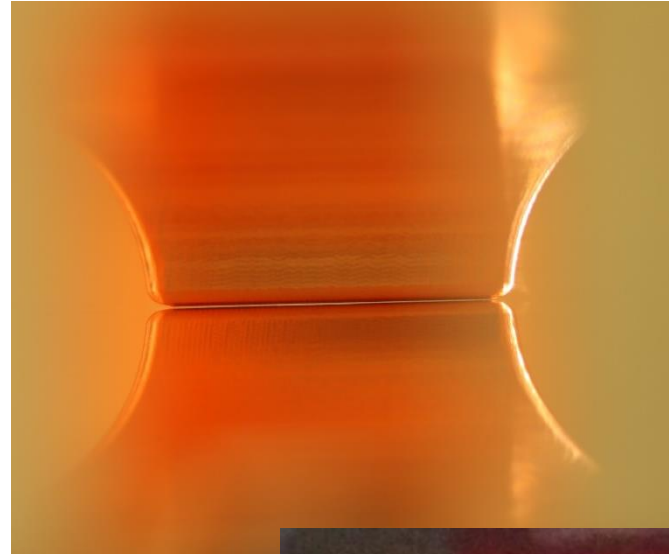
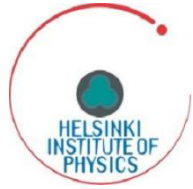


# Cad Design



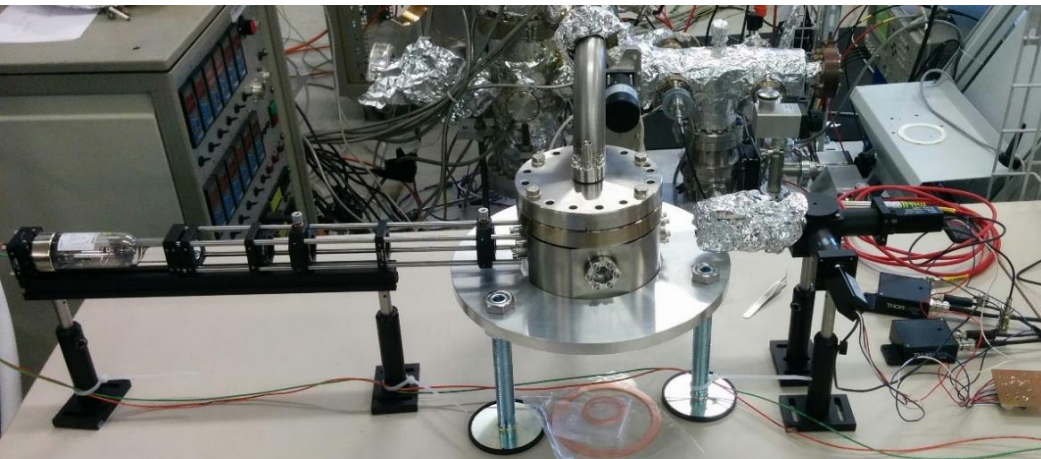
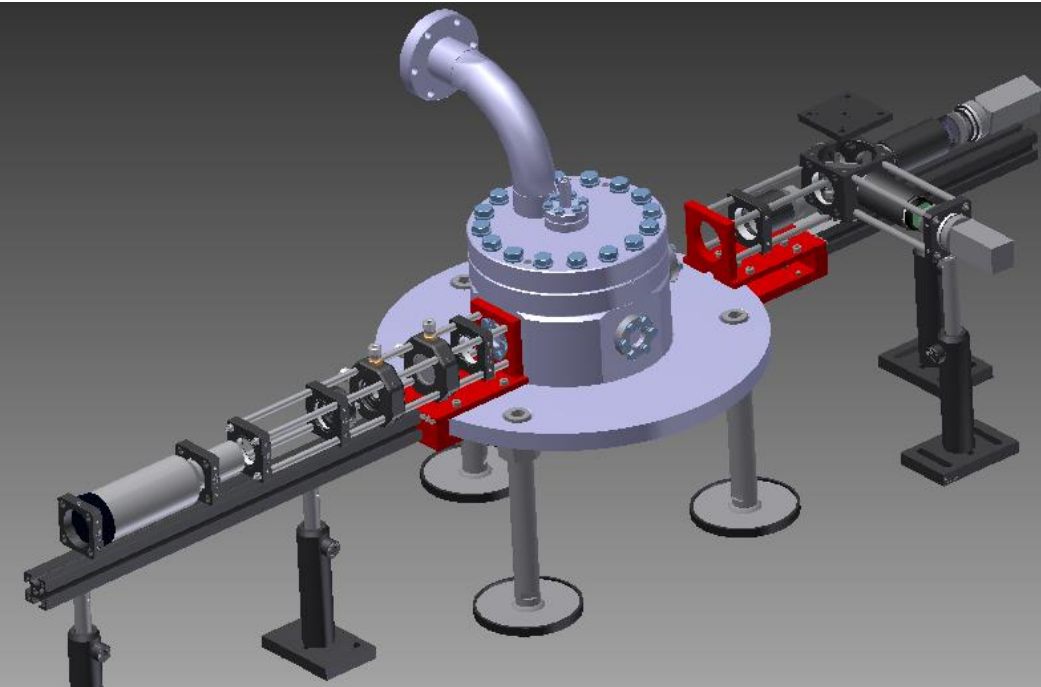


# Optics and Electrodes

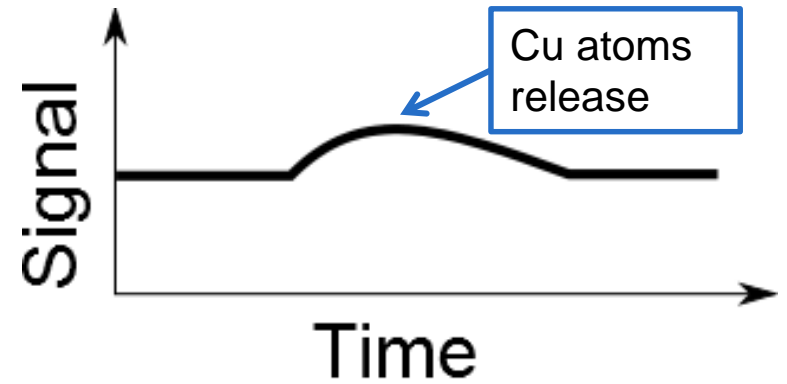




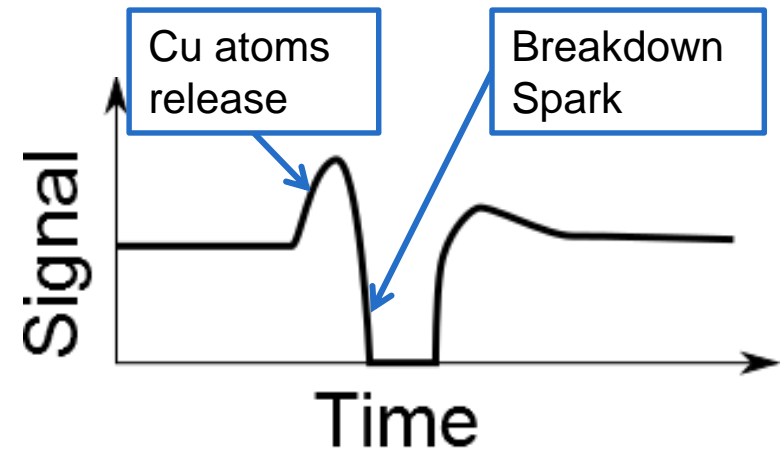
# DVM & DC Spark



Estimated signal for conditioning process

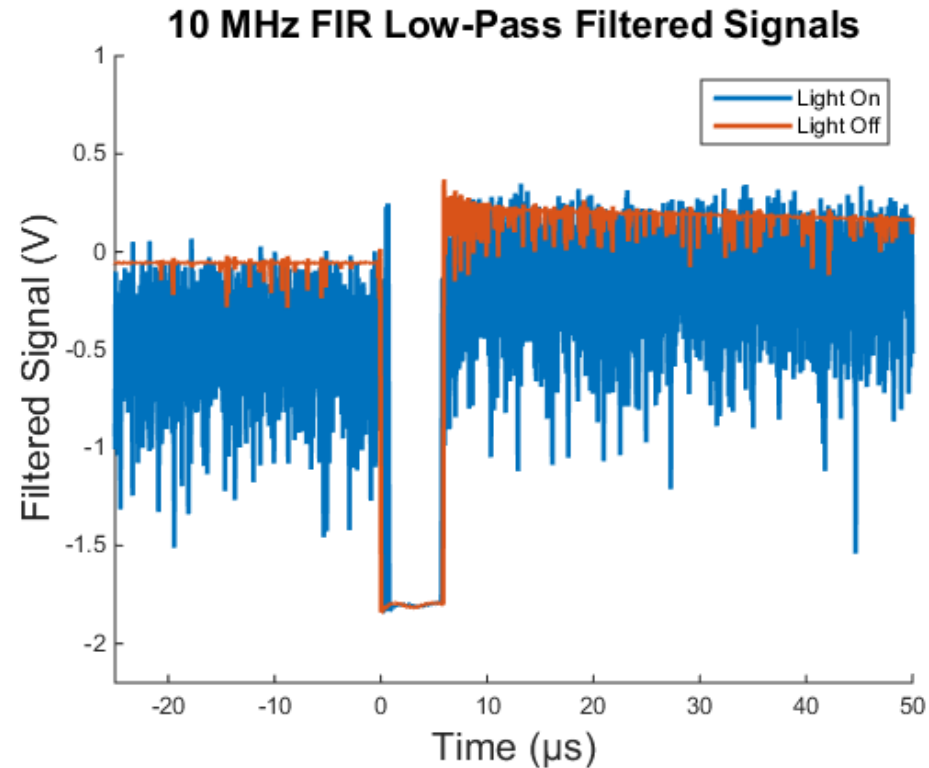
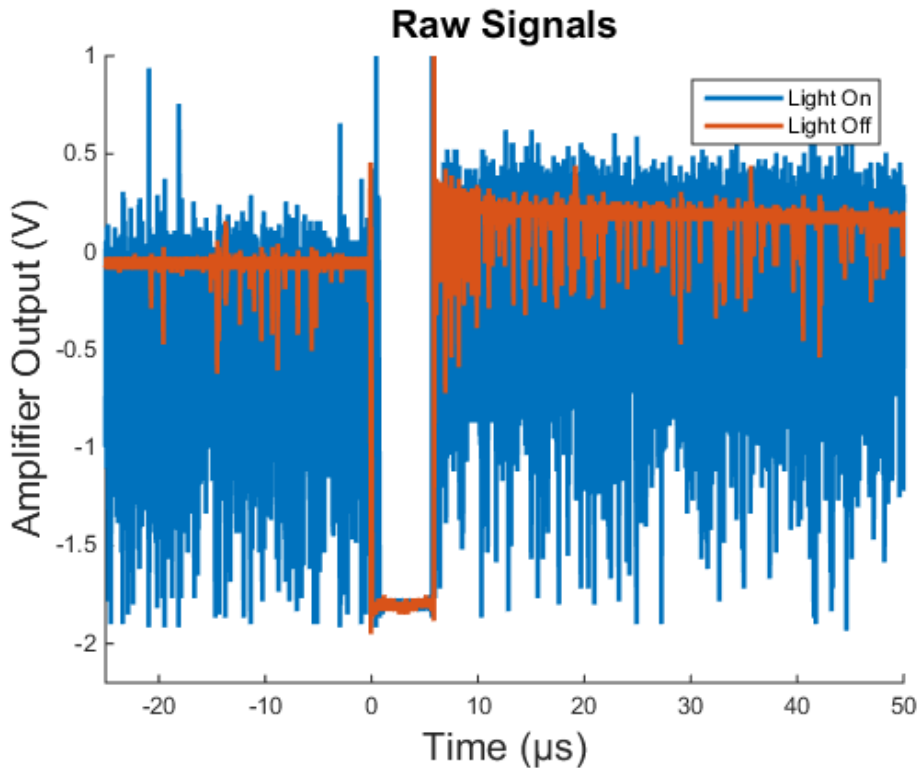
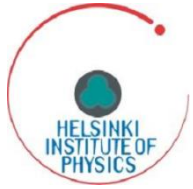


Estimated signal for Breakdown





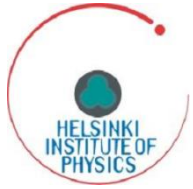
# Results from Breakdown





# Future Measurements

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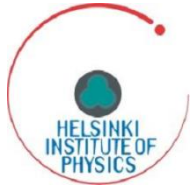


- Period: 22.1. – 25.2.
  - CLIC workshop 18.1. – 22.1.
  - Time for ~8 - 10 UHV pumping periods
- Important Measurements
  1. DC-spark, pre-breakdown and recovery
  2. Does conditioning evaporate Cu-atoms?
  3. Simultaneously scattered-& absorbed measurements
  4. Spectrometer measurements (Optional)
  5. Fluorescence measurements (Optional)
- Do we see difference during breakdown / electrode conditioning?
- One electrode pair exists, Is that sufficient?



# Conclusion

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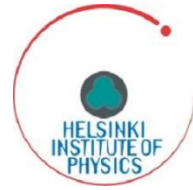


- DVM is installed to DC-spark system
- First test measurements have been done
- Measurements series will be done Jan. – Feb. 2016
  - Cu atoms released before/during/after breakdown?
  - Cu atoms released during conditioning?



# Questions and Comments

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Thank You!