

EXPERIMENTAL STUDY OF ELECTRON GUNS WITH FIELD EMISSION AND LARGE EMITTER TIPS

JSC «RPE «Toriy»

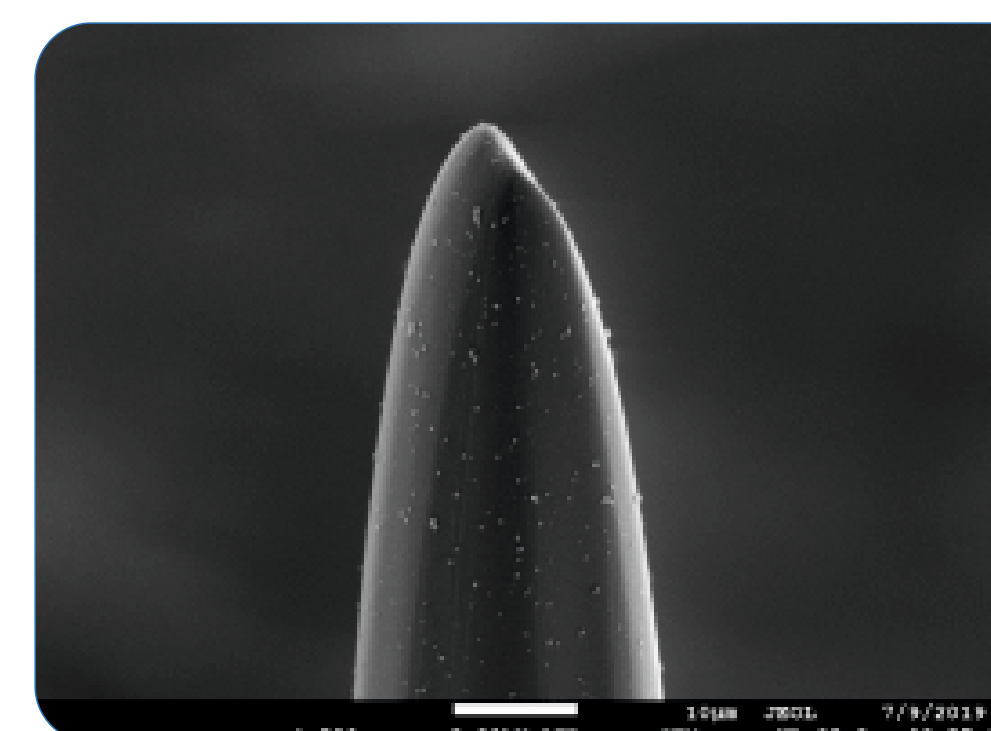
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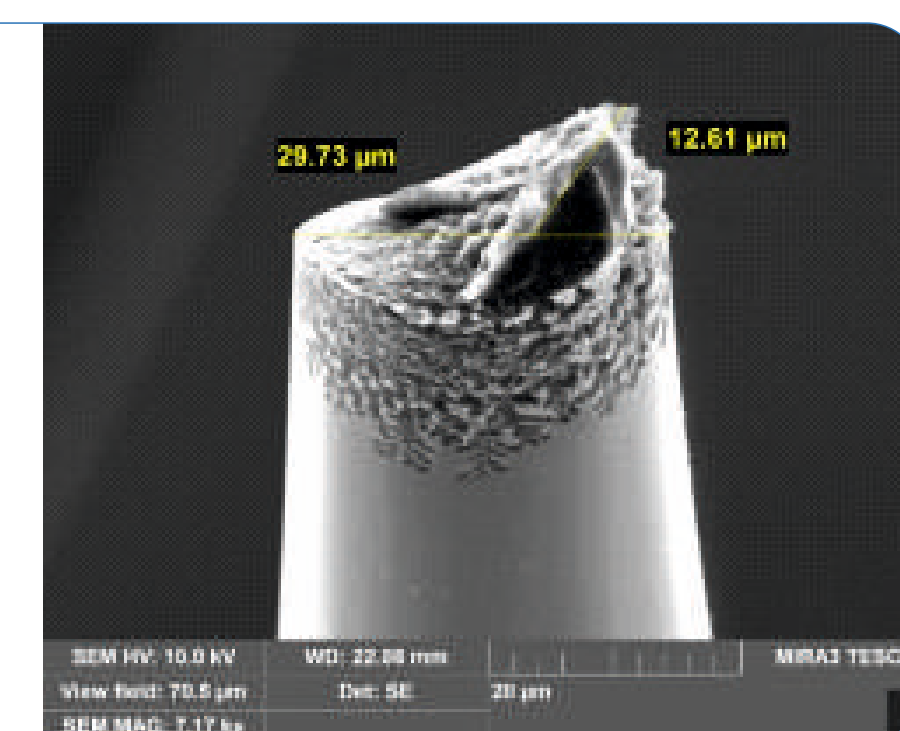
Laser micro-fabricated emitters

Different types of emitter materials:

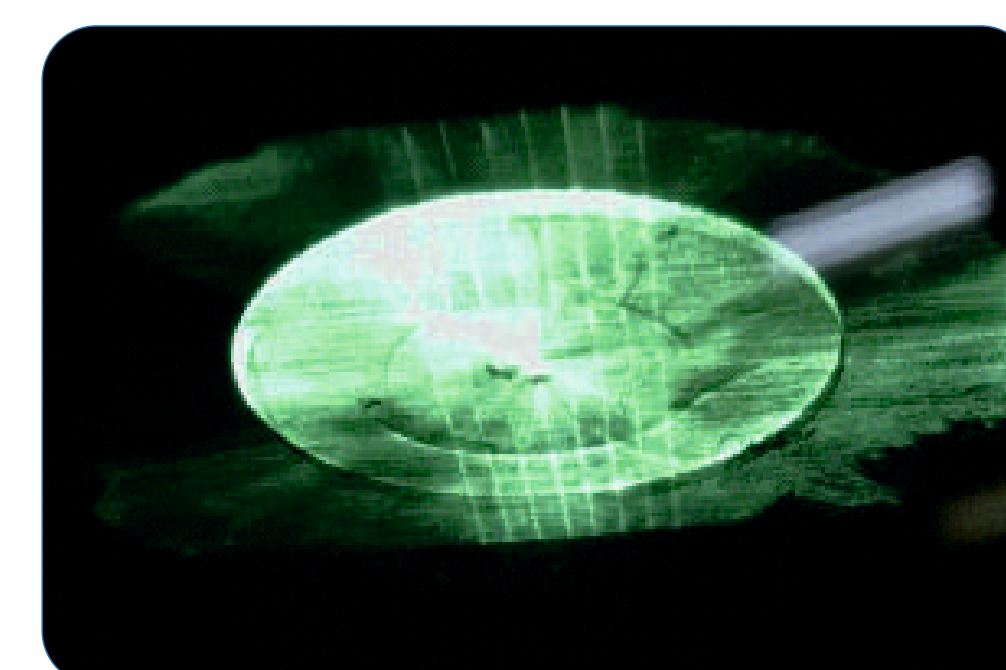
- glassy carbon SU-2000



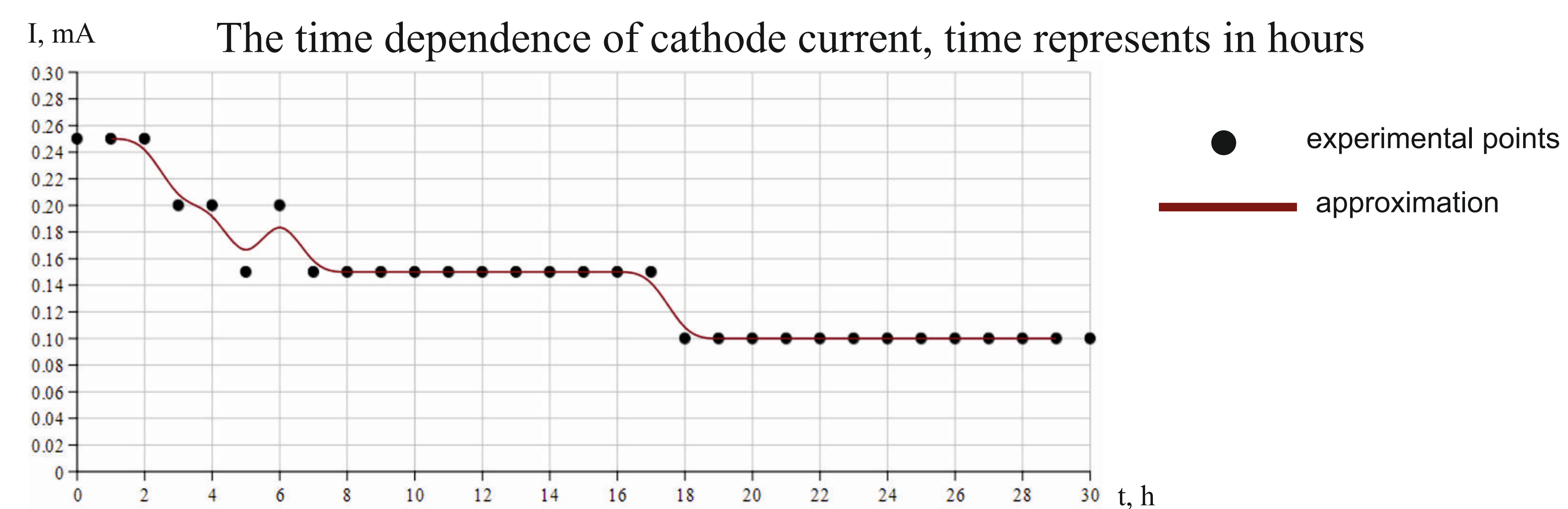
before experimental testing



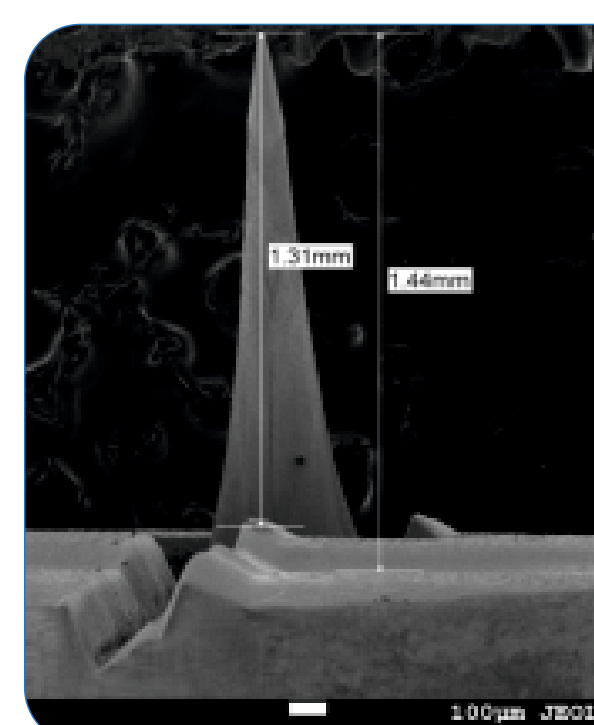
after experimental testing



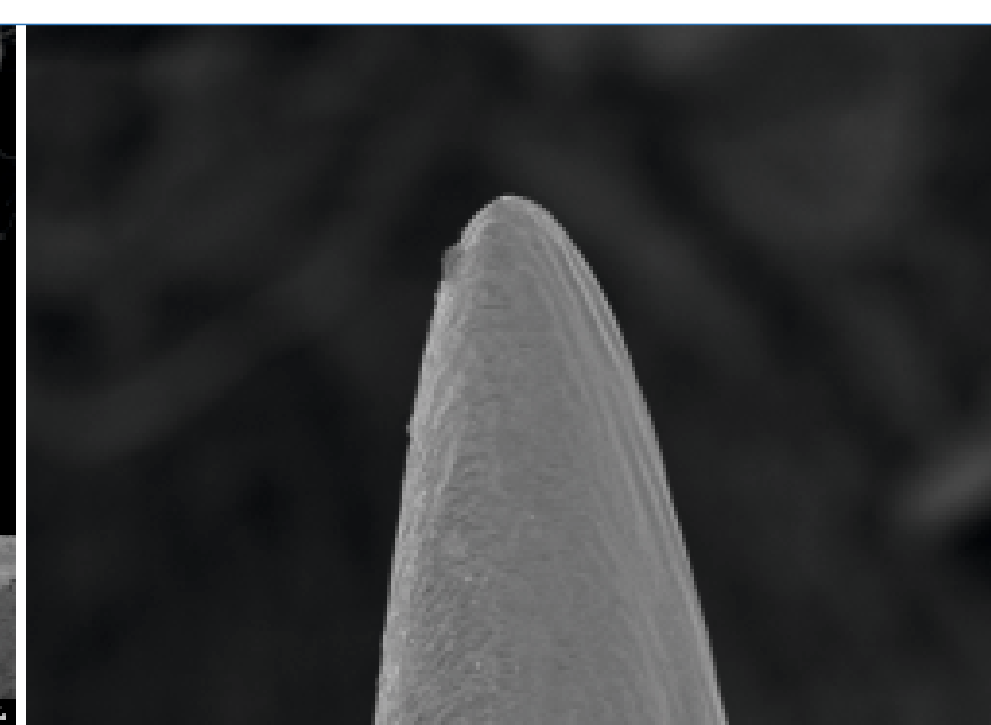
electron beam mark on the fluorescent screen



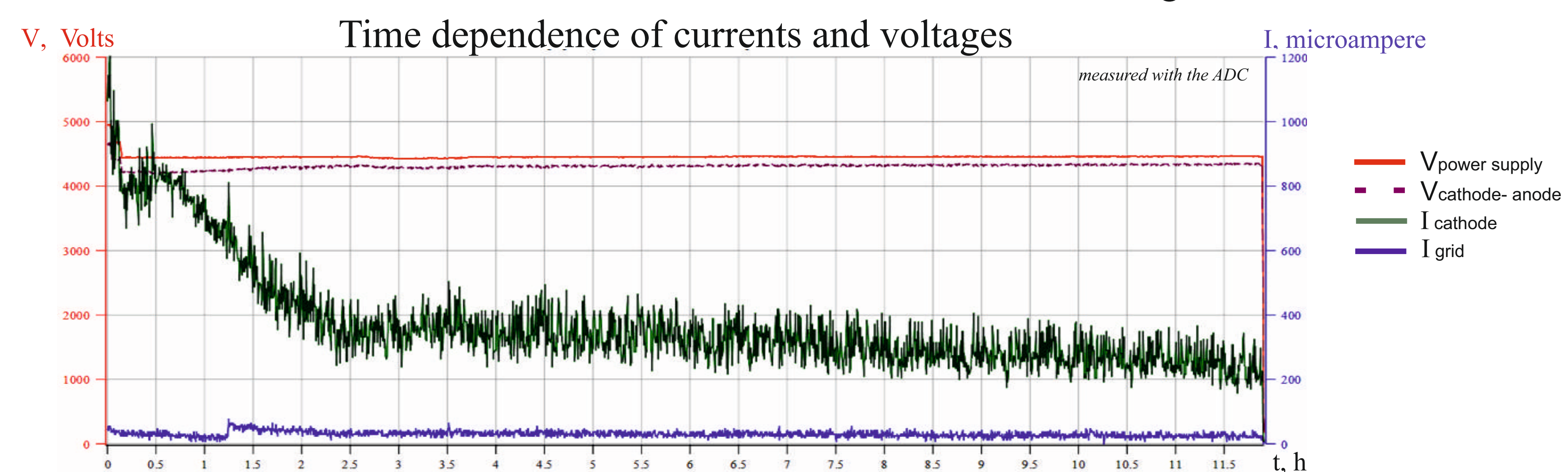
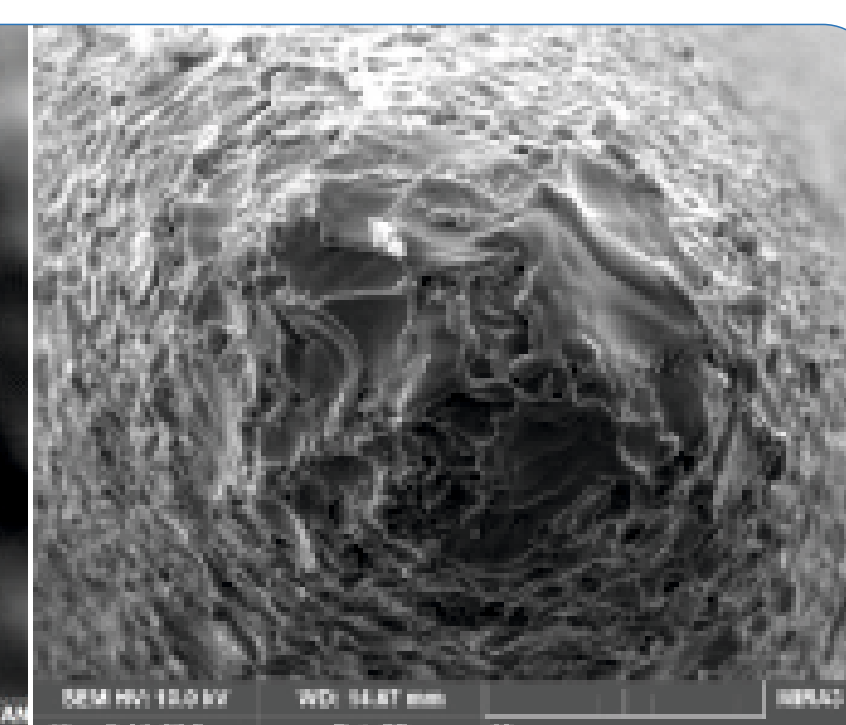
- tungsten



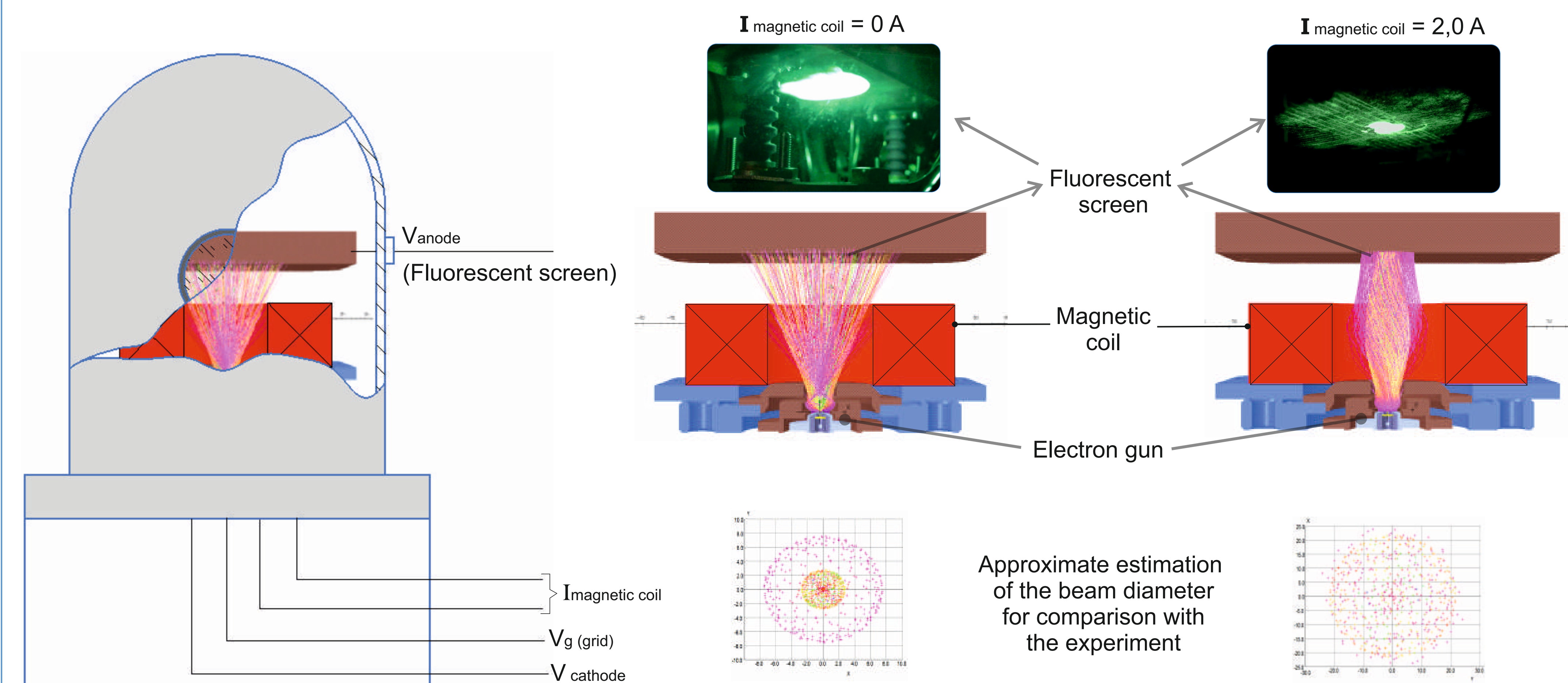
before experimental testing



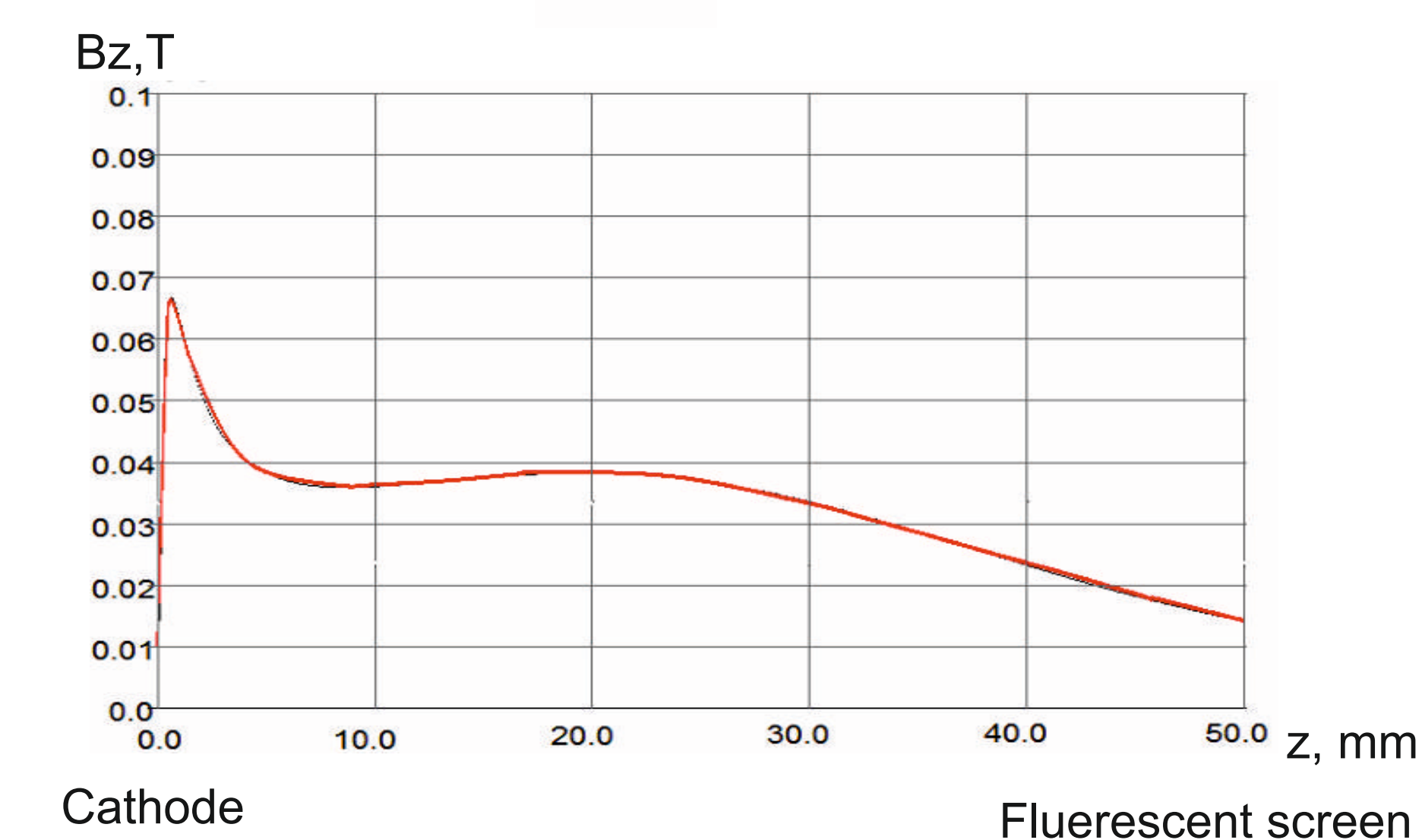
after experimental testing



Vacuum chamber



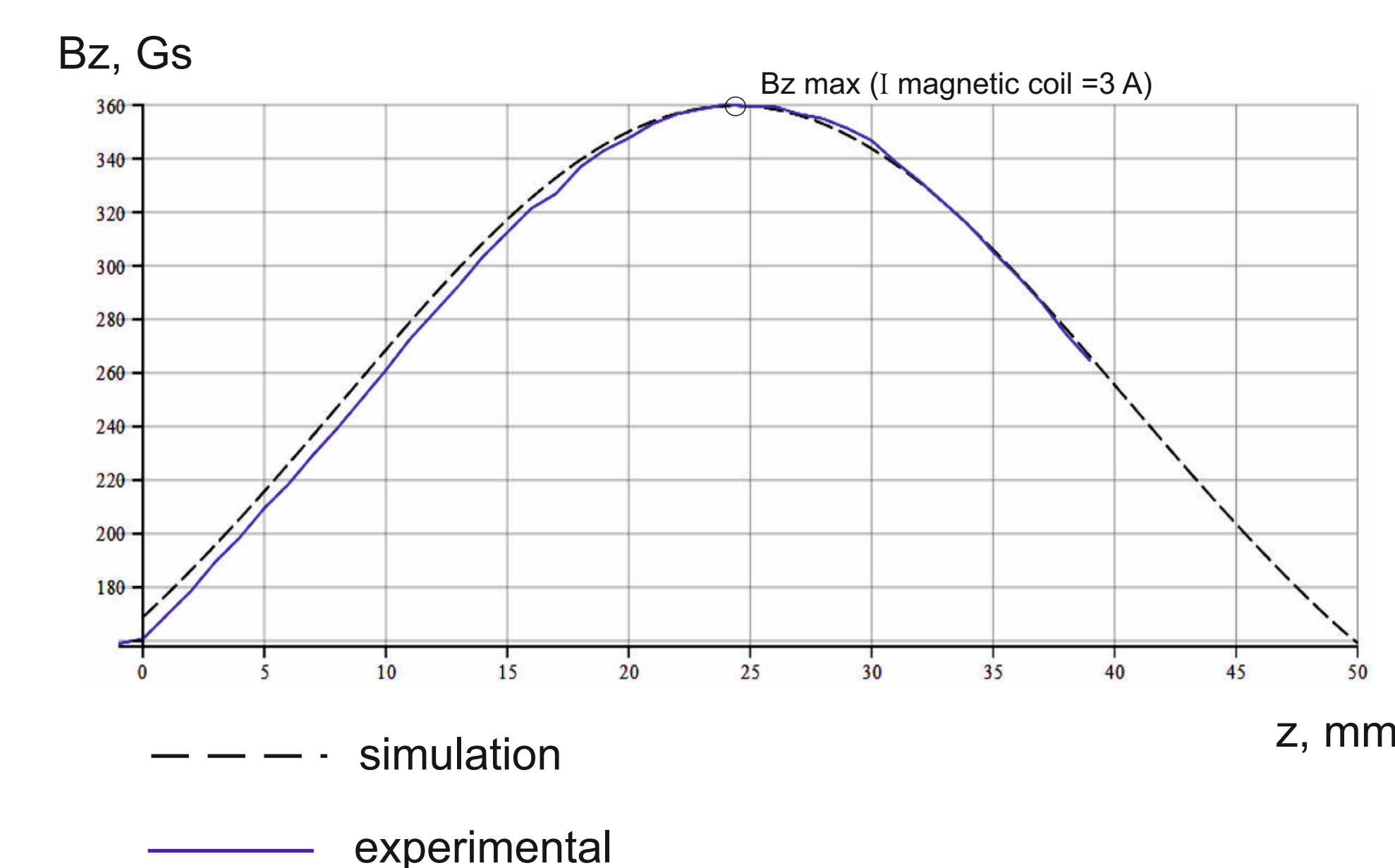
Distribution of the magnetic field inside the system



$I_{\text{cathode}} = 0.44 \text{ mA}$
 $V_{\text{grid}} = V_{\text{anode}} = 5200 \text{ V}$
Grid interception = 2 %

Residual gas pressure
 $4.0 \cdot 10^{-8} \text{ Torr}$

Calibration of the magnetic coil



Magnetic coil current $I_{\text{magnetic coil}}$, A	Magnetic field B_z max, Gs	Electron beam diameter, mm
0	0	40
1,0	120	40
1,5	180	16 – 24
2,0	240	6-16
2,3	277	1,0-10
2,5	300	8
3	360	-