



ELECTRON BEAM DYNAMICS IN LINAC OF KURCHATOV SOURCE OF SR WITH ENERGY DOUBLING

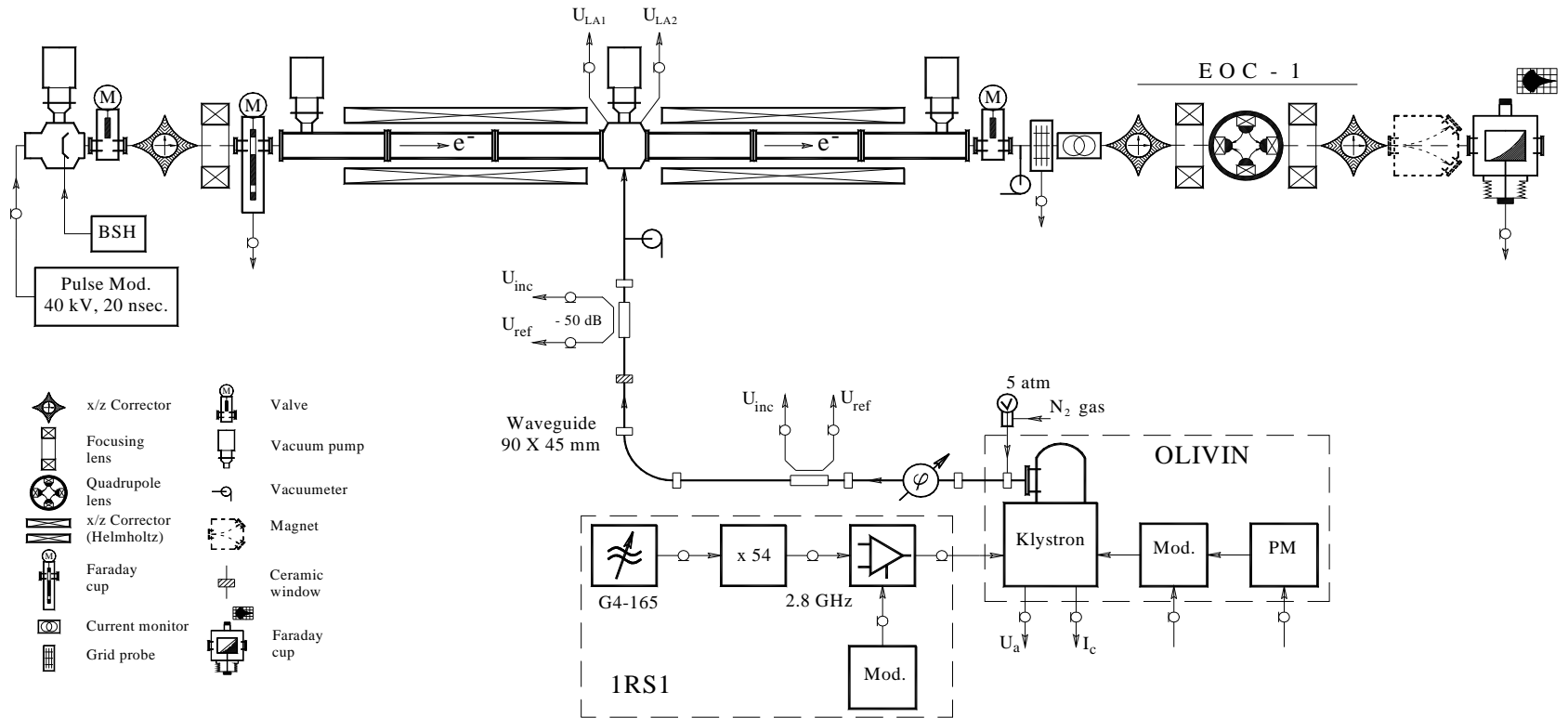
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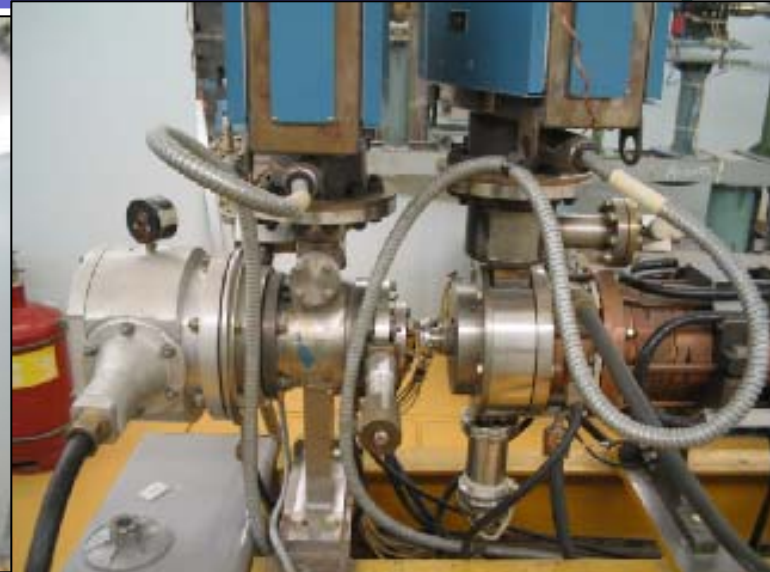
- Existing forinjector
- Forinjector after upgrade
- Electron beam dynamics in linac
- Nearest plans

The operating diagram of existing forinjector





The existing forinjector photos



Main linac parameters

RF frequency	2.8 GHz
Shunt impedance	95 M Ω /m
Q value	28000
Time constant	1.8 μ s
Length	6 m
Repetition rate	1 Hz



Electron beam parameters

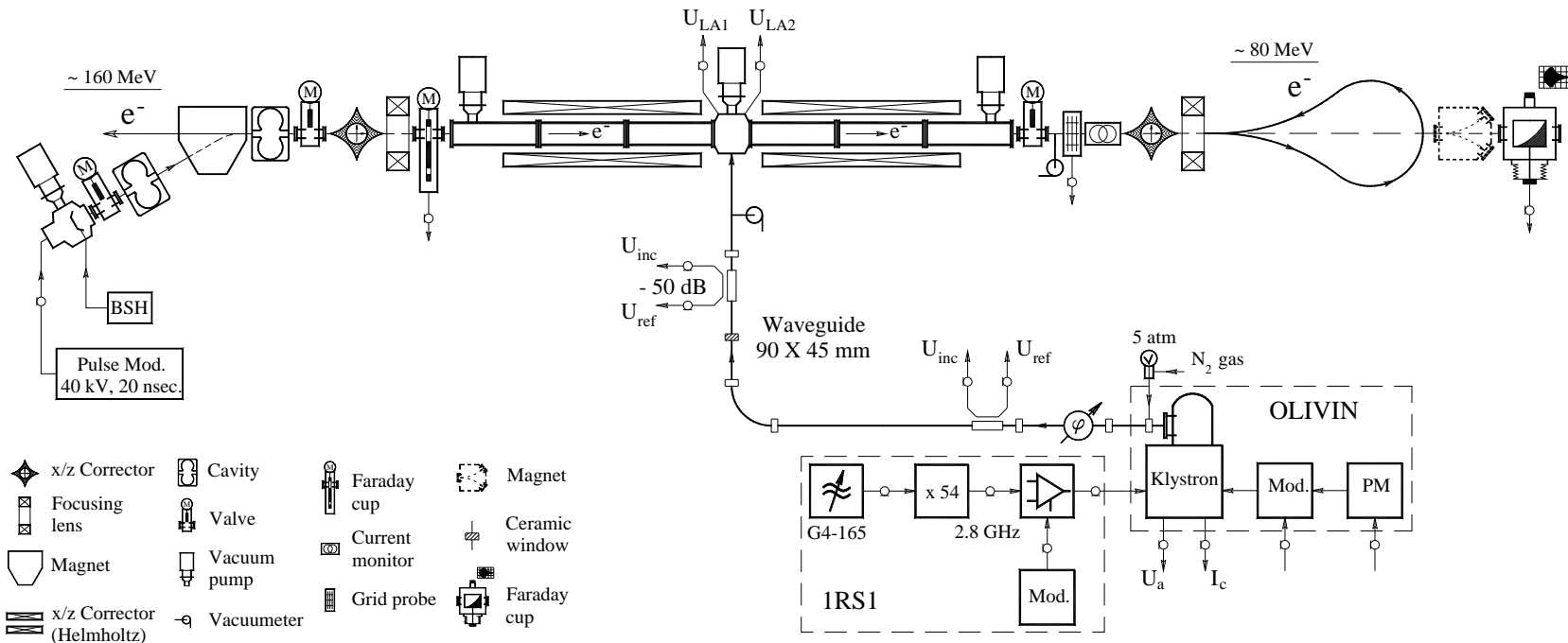
- **At the entrance into linac:**

- unbunched beam;
- $W = 40 \text{ keV}$;
- $I = 4 \text{ A}$;
- $t = 18 \text{ ns}$.

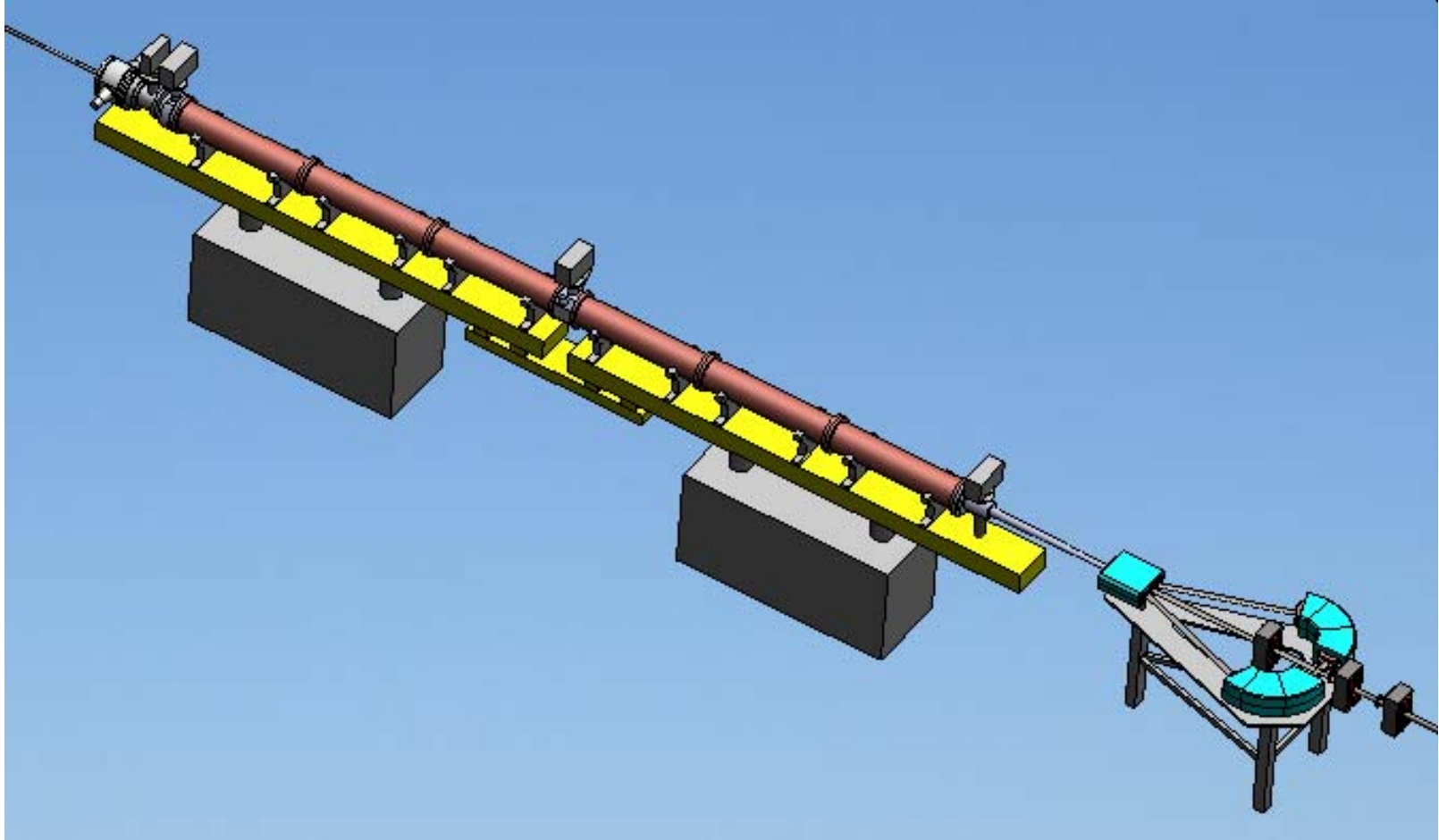
- **At the linac exit:**

- bunched beam;
- $W = 80 \text{ MeV}$;
- $I = 65 \text{ mA}$ ($\Delta W / W = 1\%$); $I = 600 \text{ mA}$ ($\Delta W / W = 7\%$);
- $\varepsilon = 300 \text{ nm}\cdot\text{rad}$.

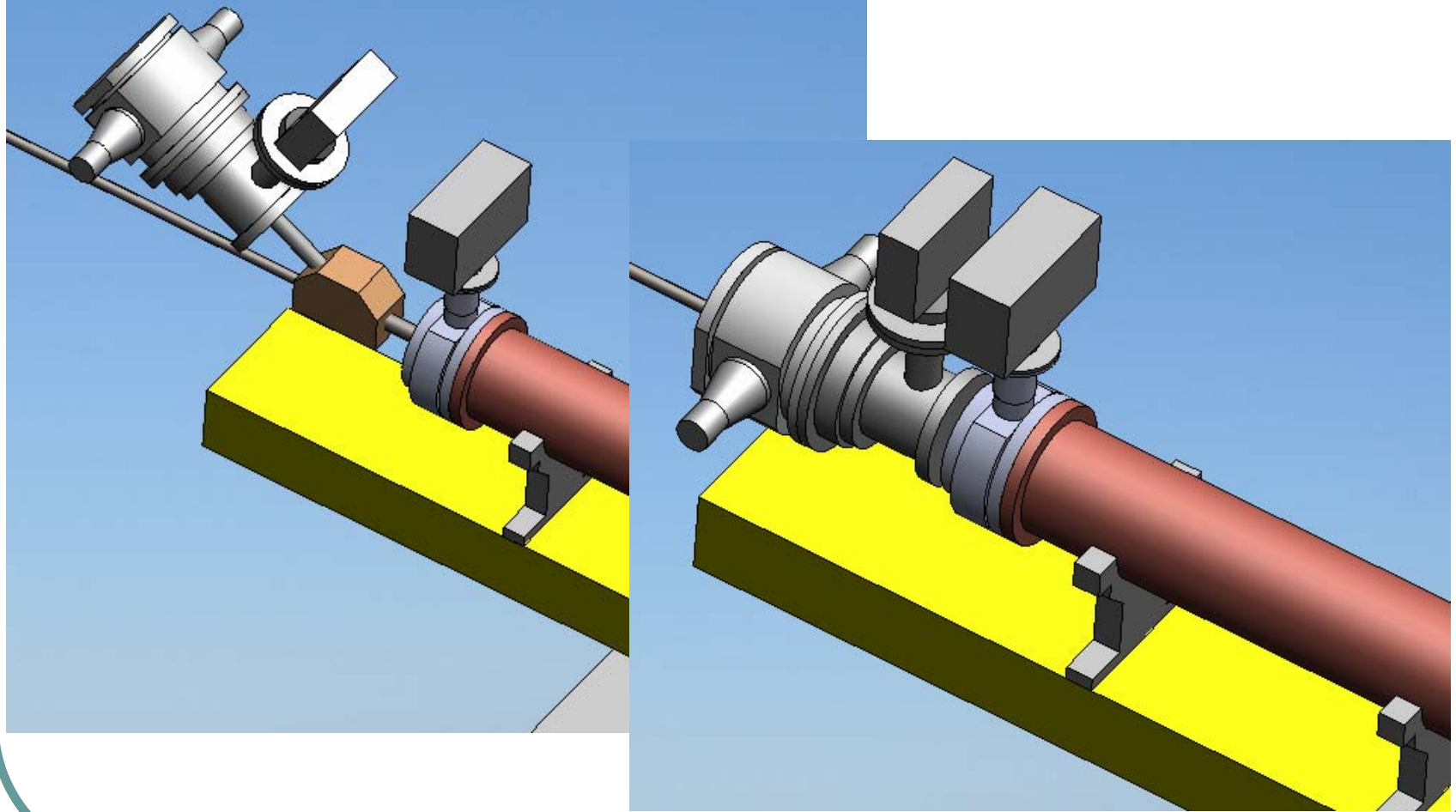
The operating diagram of forinjector after upgrade



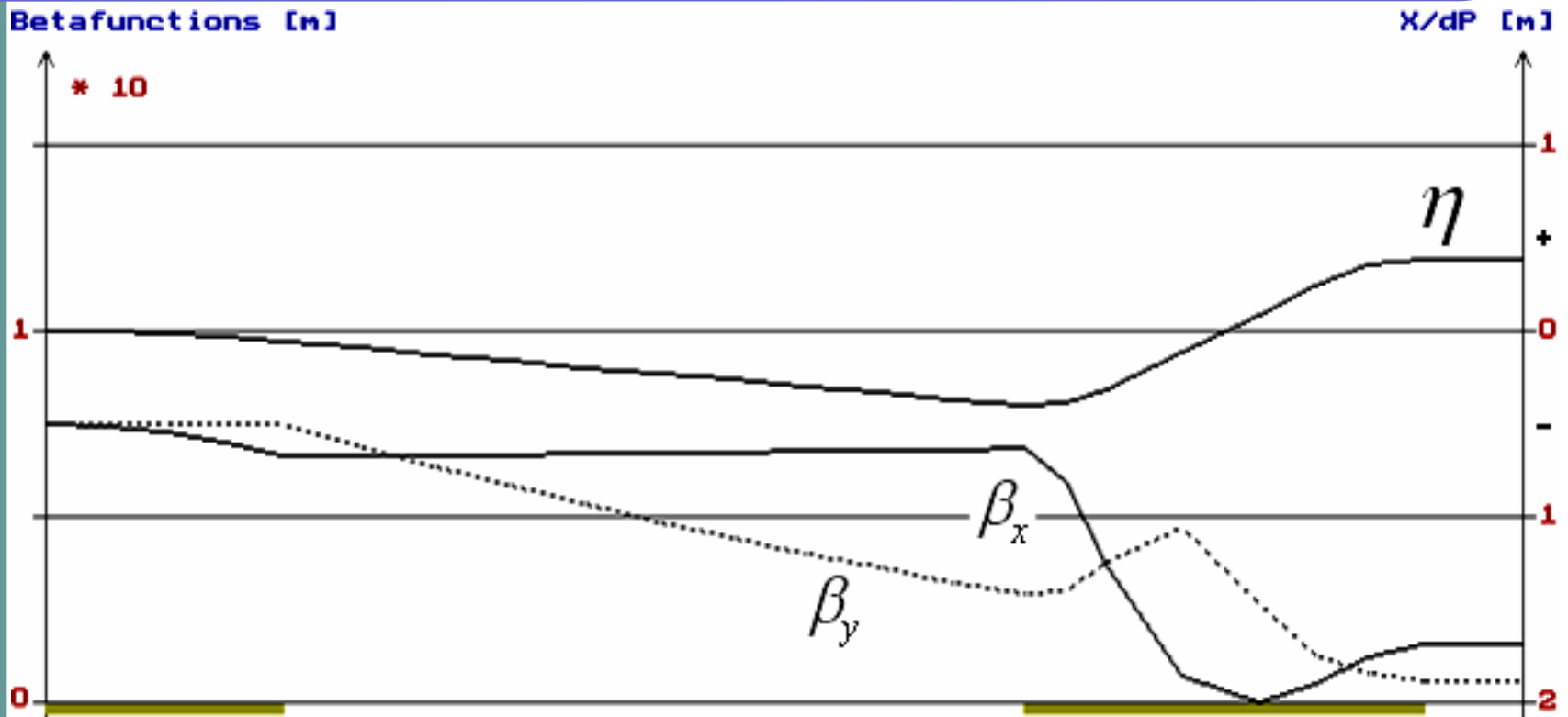
The operating diagram of forinjector after upgrade



Electron gun location

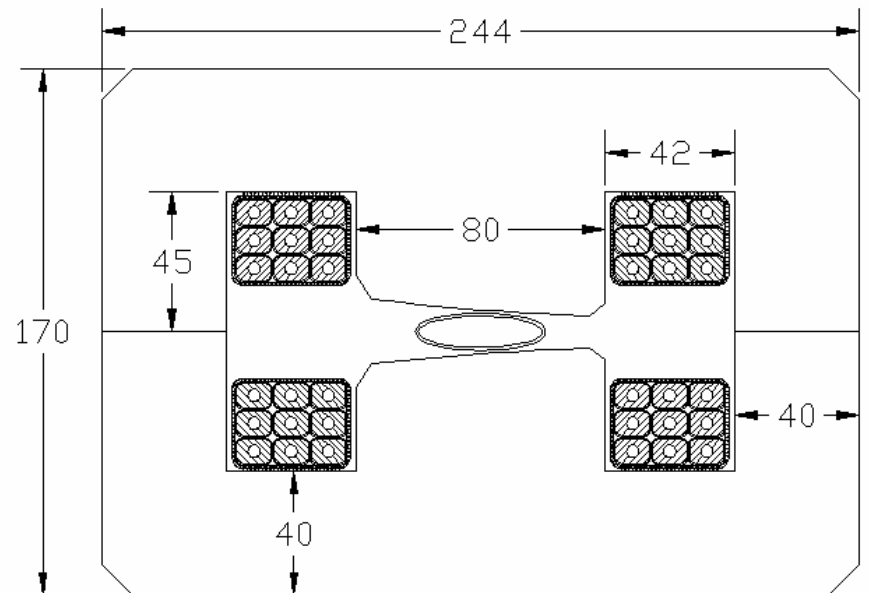
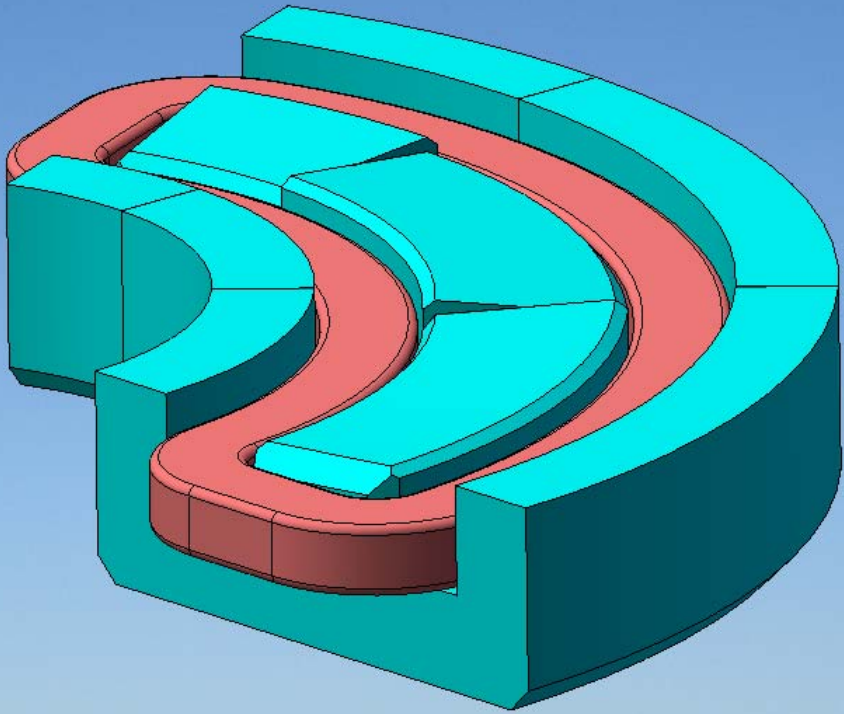


Magnetic mirror





Bending magnet design





Beam monitoring into magnetic mirror

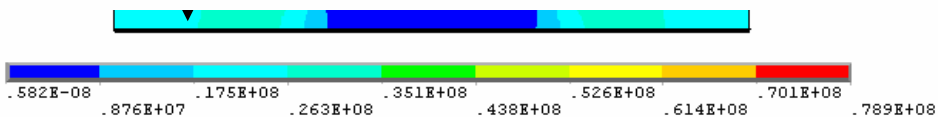
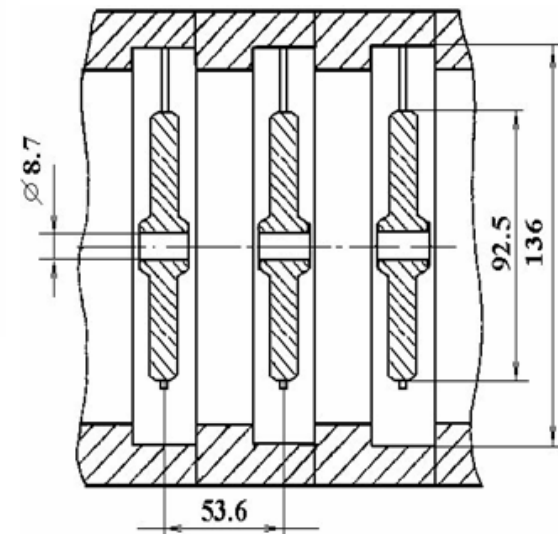
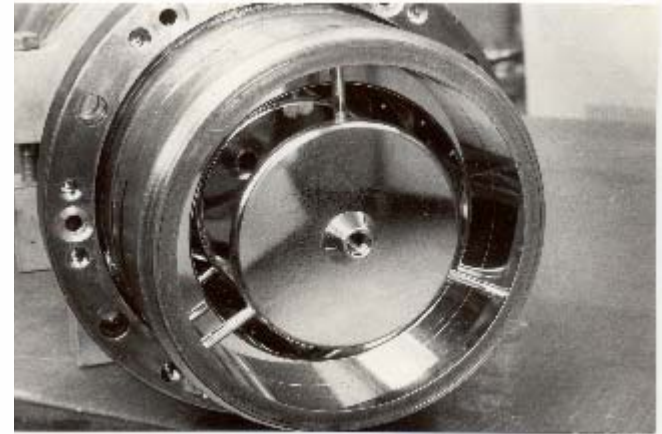
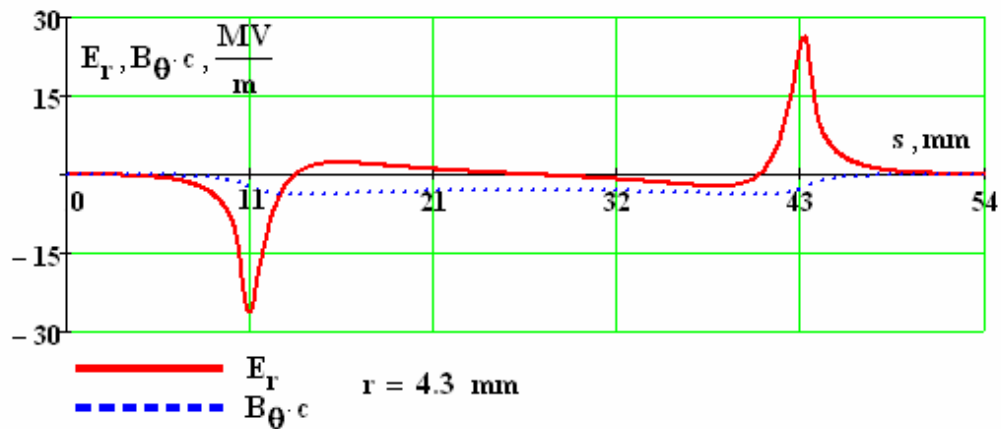
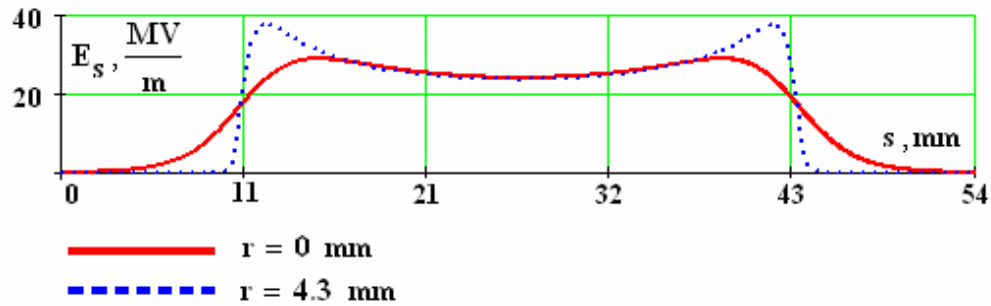
- ***Collimators***
- ***Luminiferous sensors***
- ***Trajectory correctors***



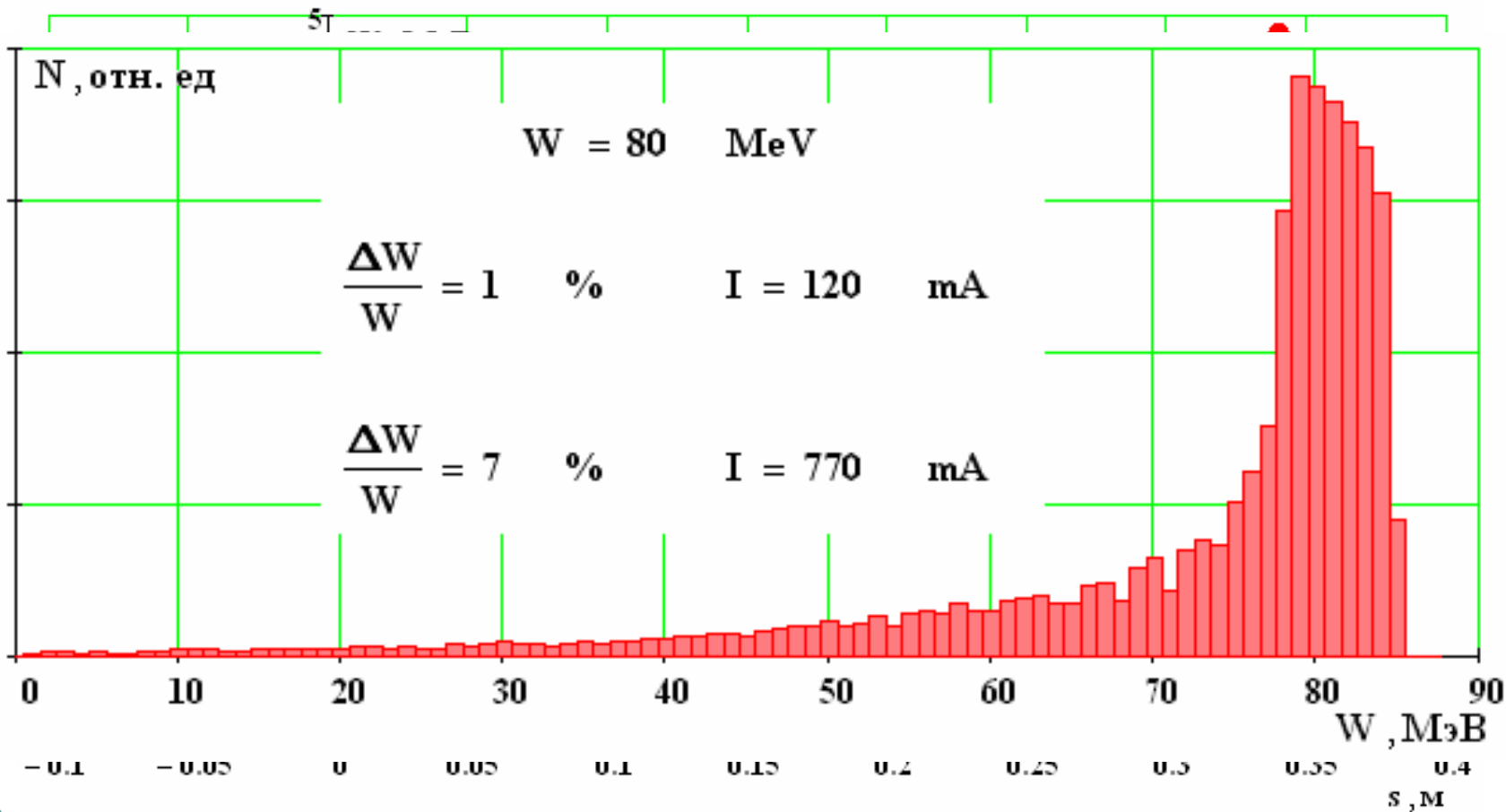
Electron beam dynamics in linac and magnetic mirror

- Electromagnetic field calculation in linac
- Electron beam dynamics in linac at single passage
- Electron beam dynamics in magnetic mirror
- Electron beam dynamics in linac at second passage

Electromagnetic field in linac

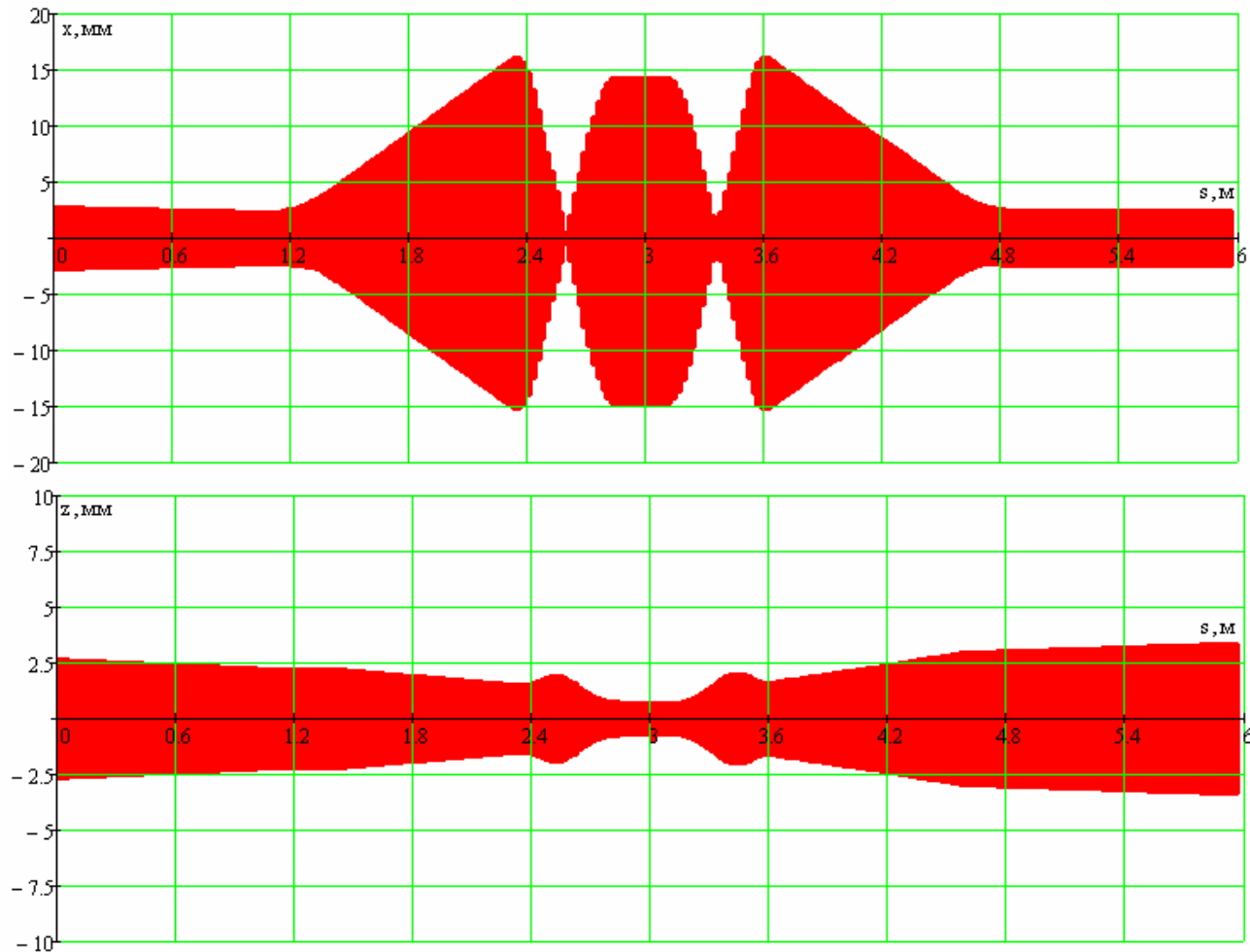


Electron beam dynamics in linac at single passage

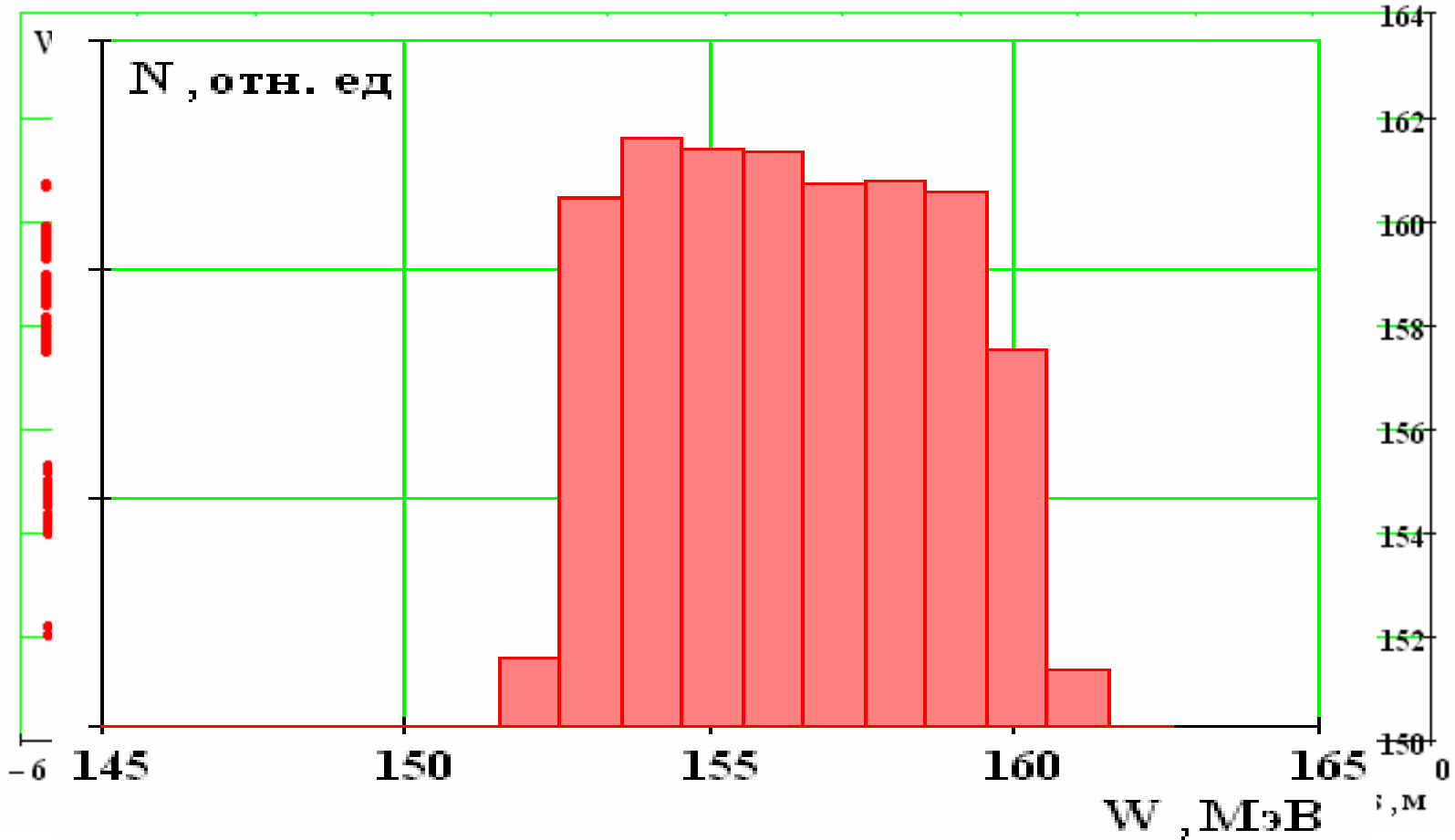




Electron beam dynamics in magnetic mirror



Electron beam dynamics in linac at second passage





Nearest plans

- Beam dynamics calculation with buncher present between electron gun and linac.
- Beam emittance and energy distribution measurement after electron beam single passage through accelerating structure.



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OF KURCHATOV SOURCE OF SR
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Thank you for your attention!