

Problems and prospects of the Tandem Accelerator with Vacuum Insulation

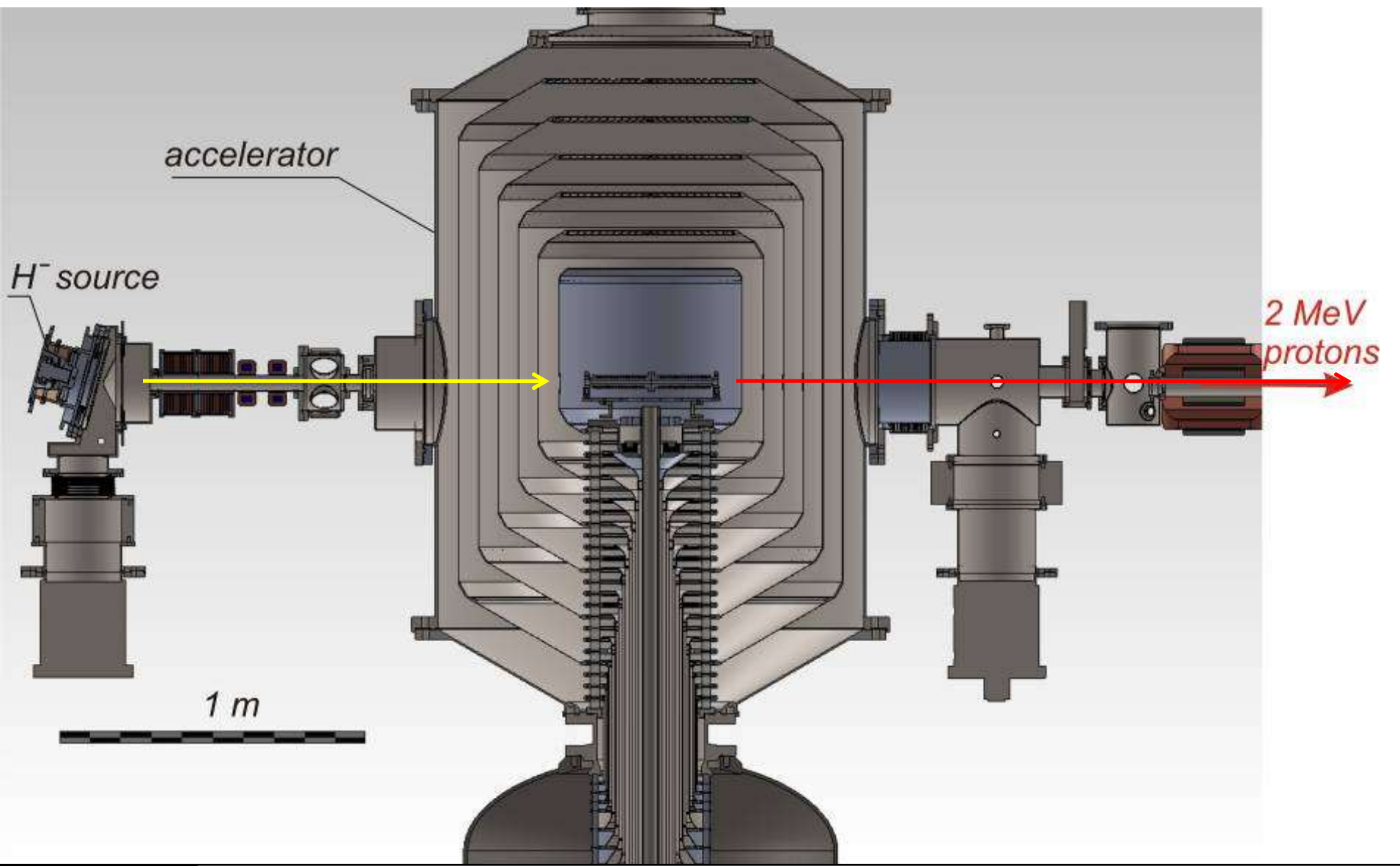
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high rate of acceleration – 25 keV/cm

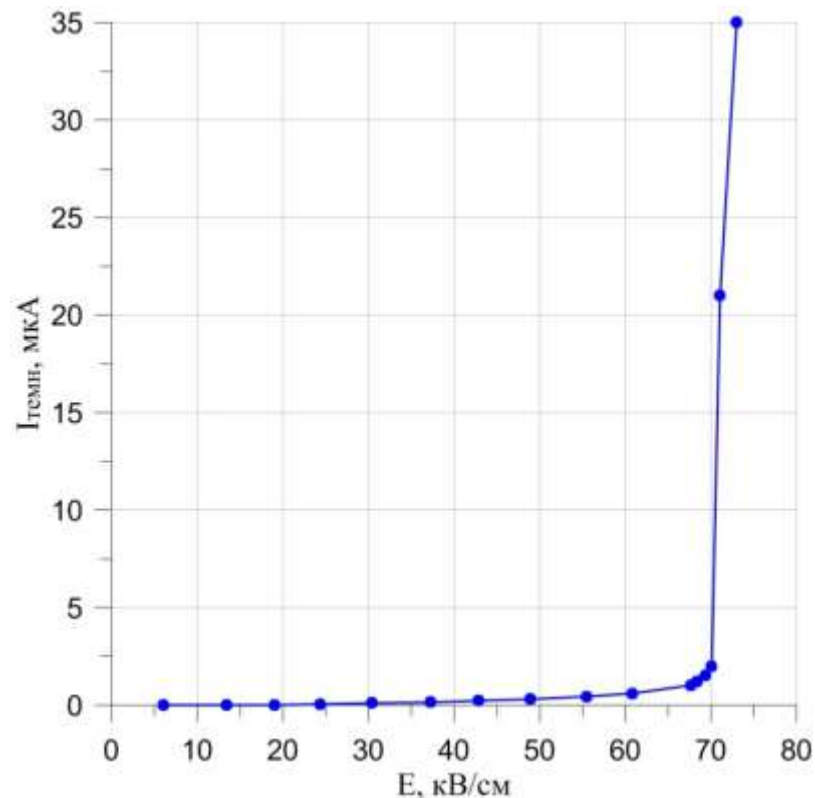
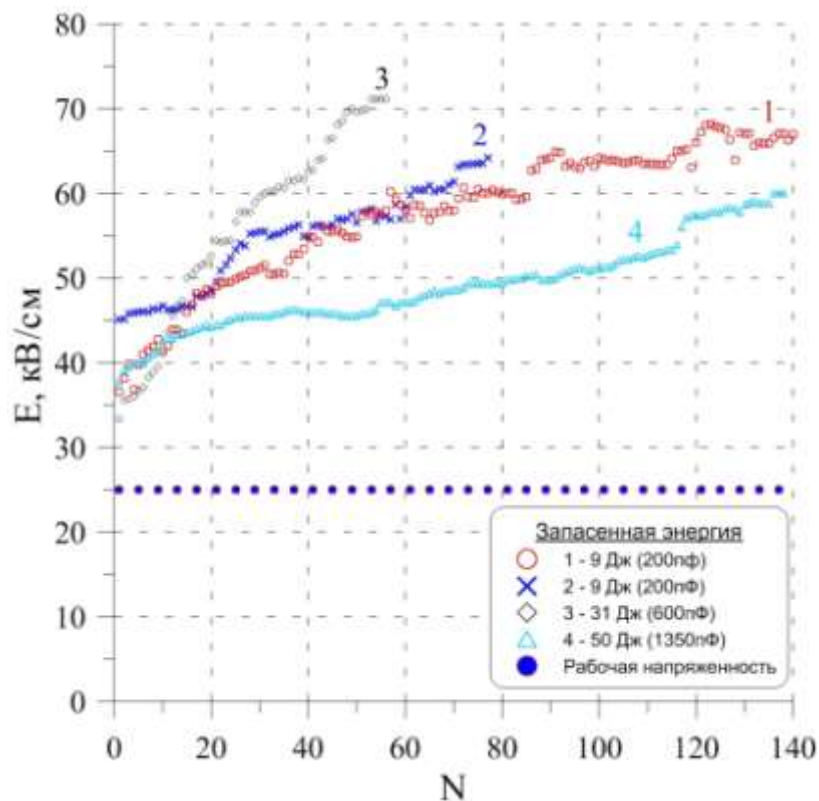




high-voltage strength gaps due to the large stored energy

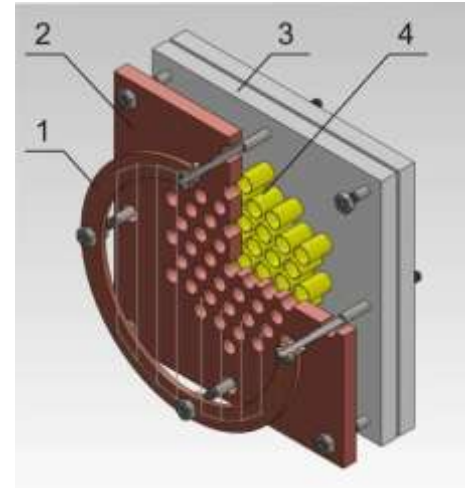
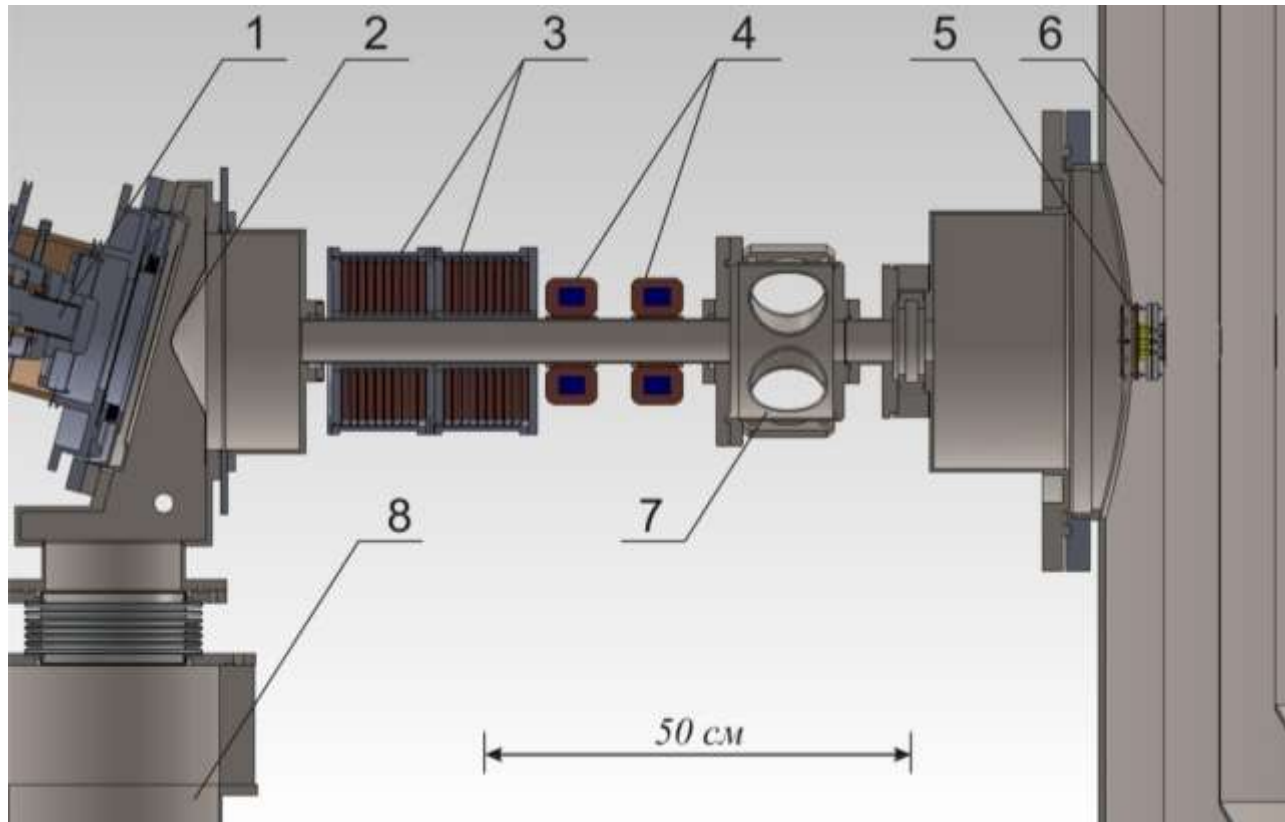
☺ breakdowns at stored energy of 50 J did not lead to the gaps detrainning

☺ required voltage of 1 MV has been obtained



strong input electrostatic lens

☺ acceleration of the ion beam without significant losses

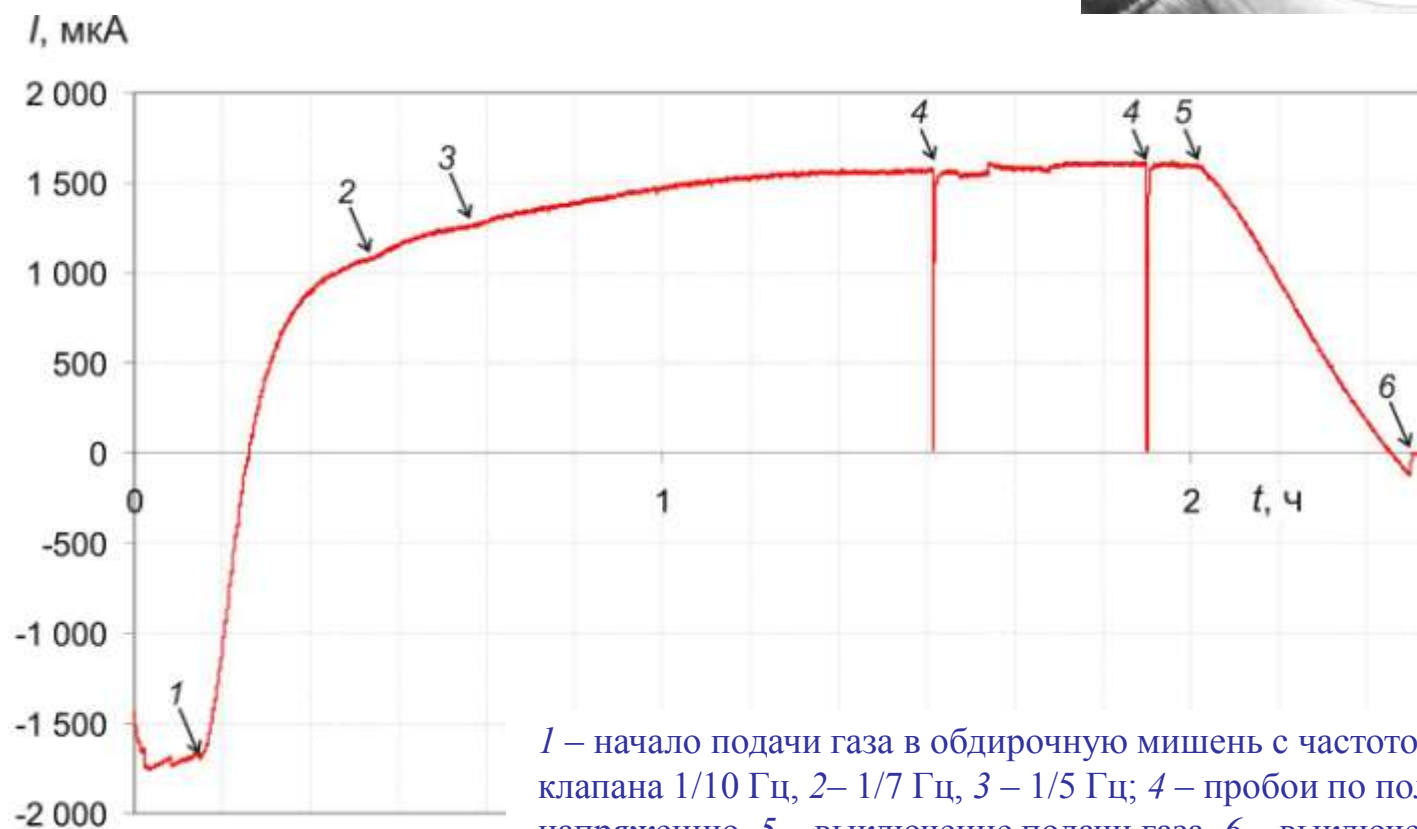


now

Energy – $2 \pm 0,002$ MeV

Current – $1,6 \pm 0,007$ mA

Duration – more 1 h



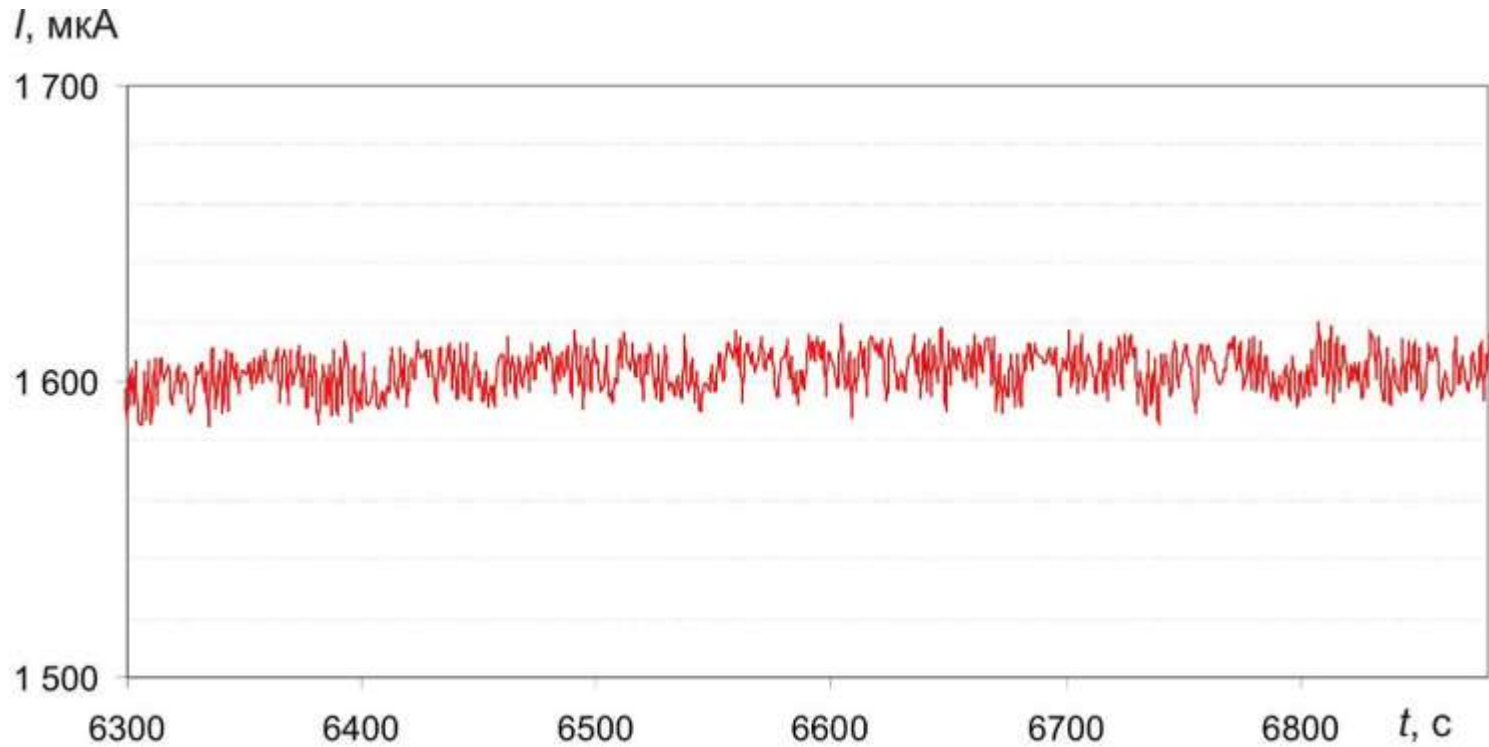
1 – начало подачи газа в обдирочную мишень с частотой открывания клапана 1/10 Гц, 2– 1/7 Гц, 3 – 1/5 Гц; 4 – пробои по полному напряжению, 5 – выключение подачи газа, 6 – выключение источника

now

Energy – $2 \pm 0,002$ MeV

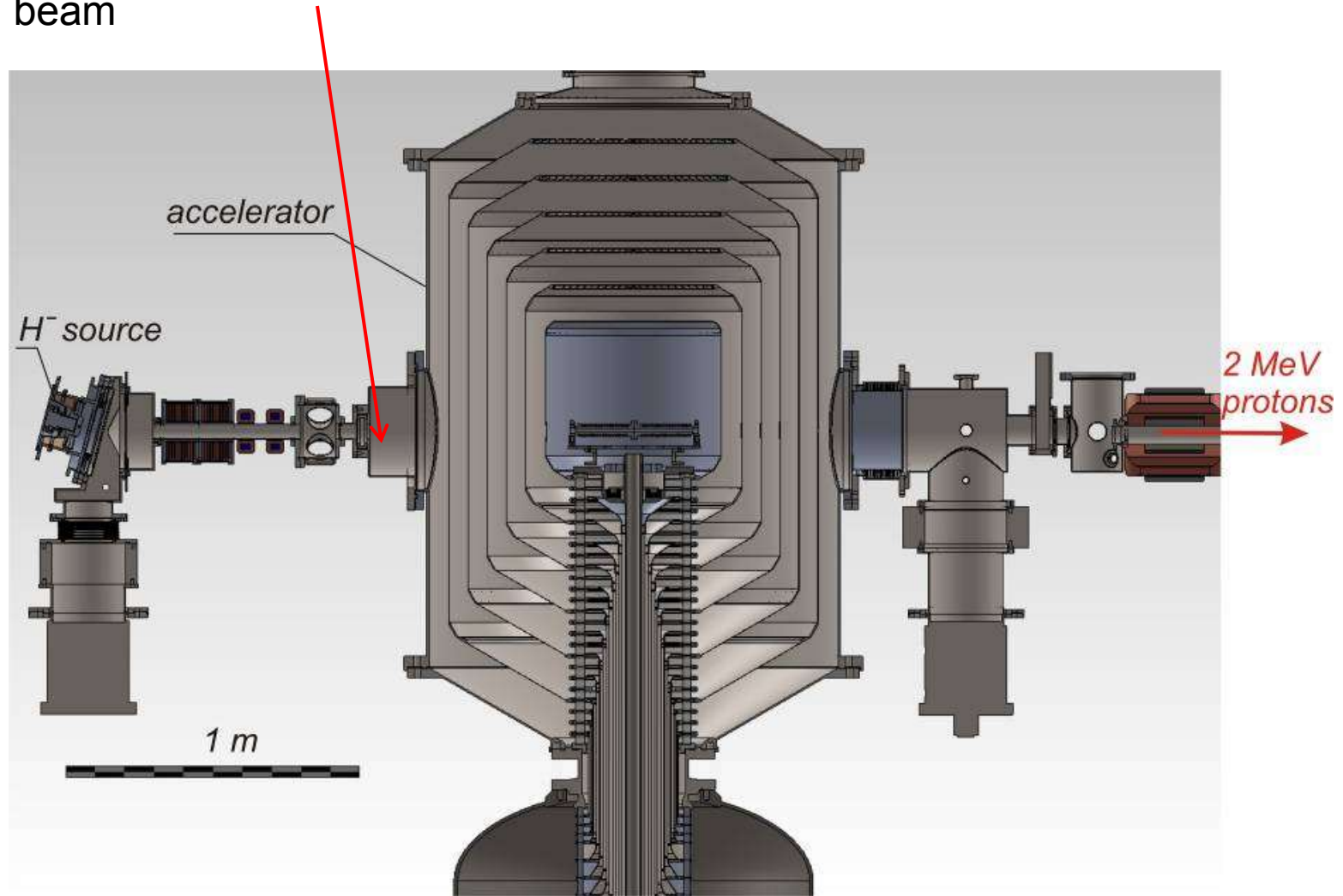
Current – $1,6 \pm 0,007$ mA

Duration – more 1 h

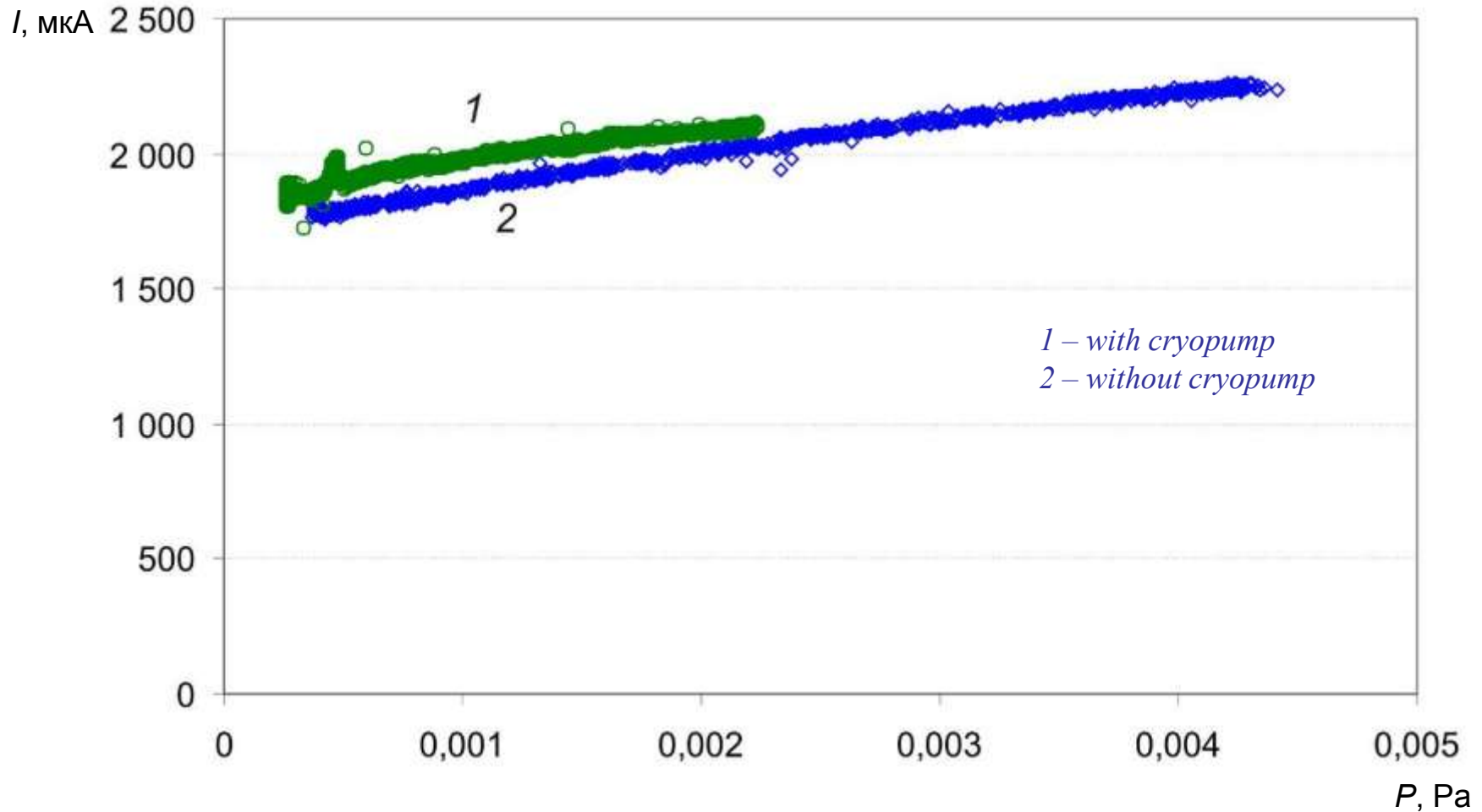


Fluxes of charged particles in accelerating gaps

Not good enough vacuum conditions in the beginning of the acceleration of the ion beam



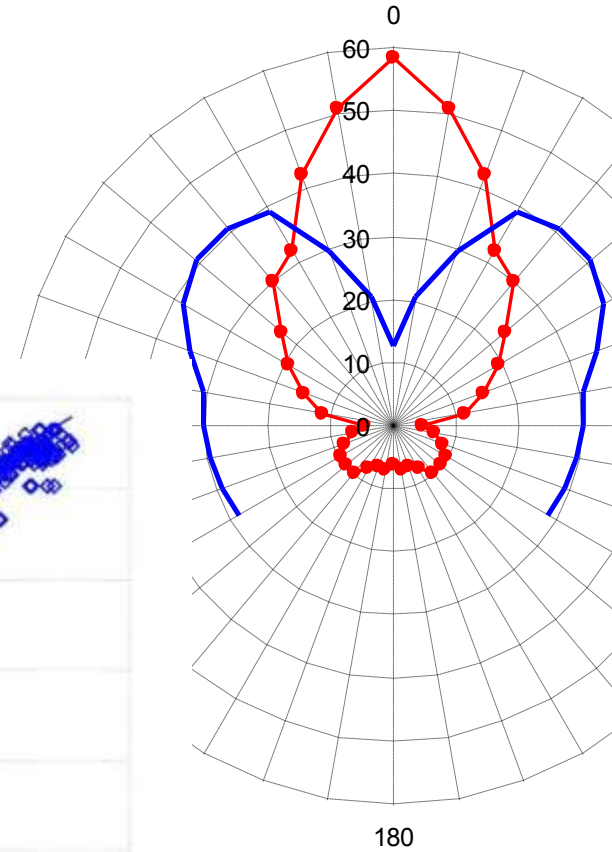
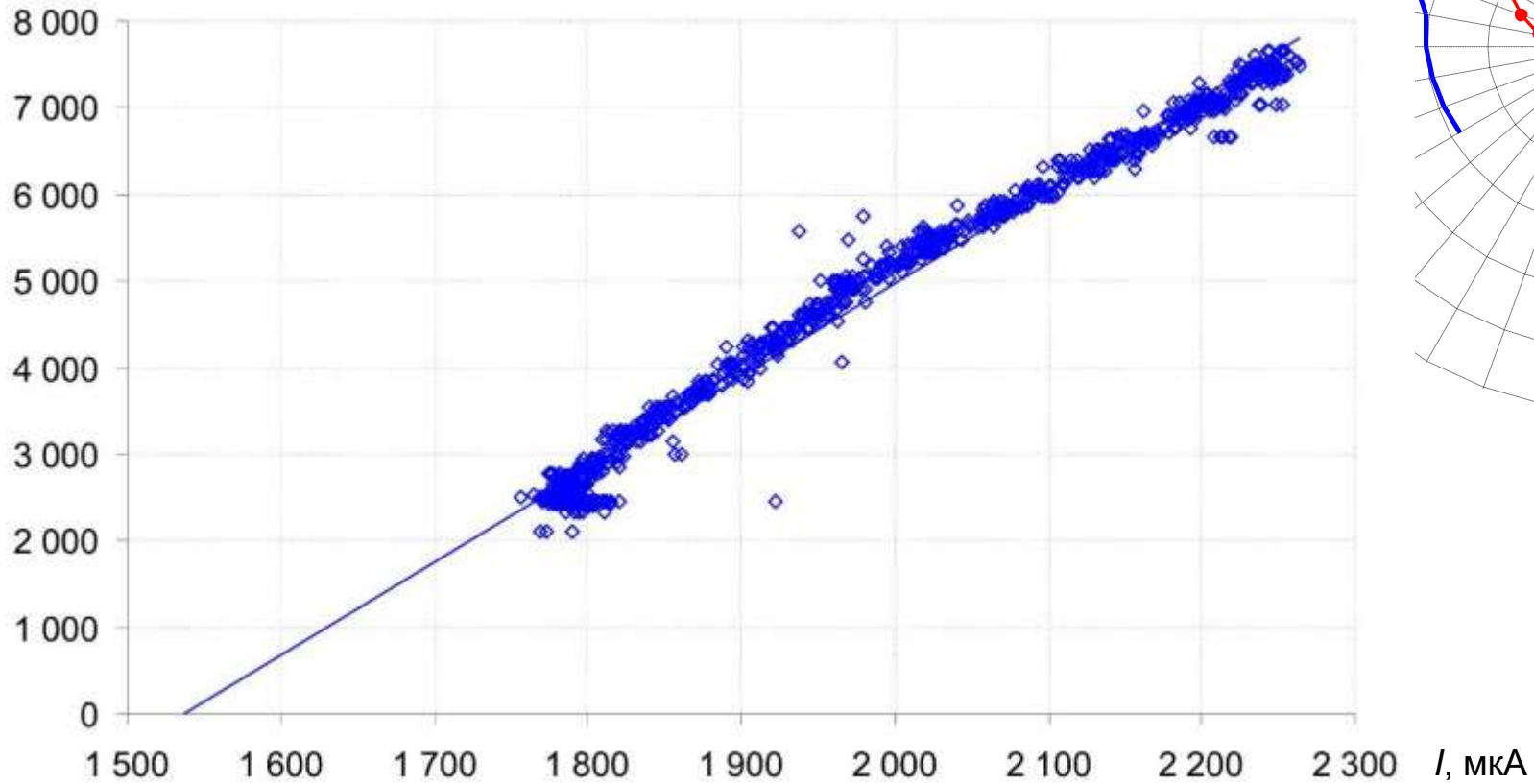
Current in accelerating gap



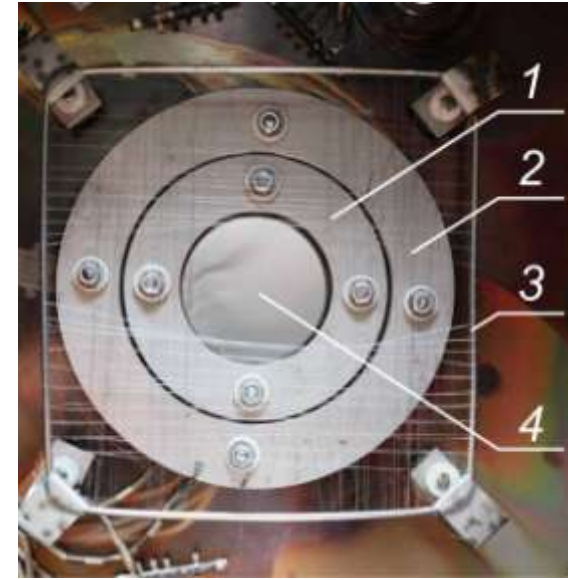
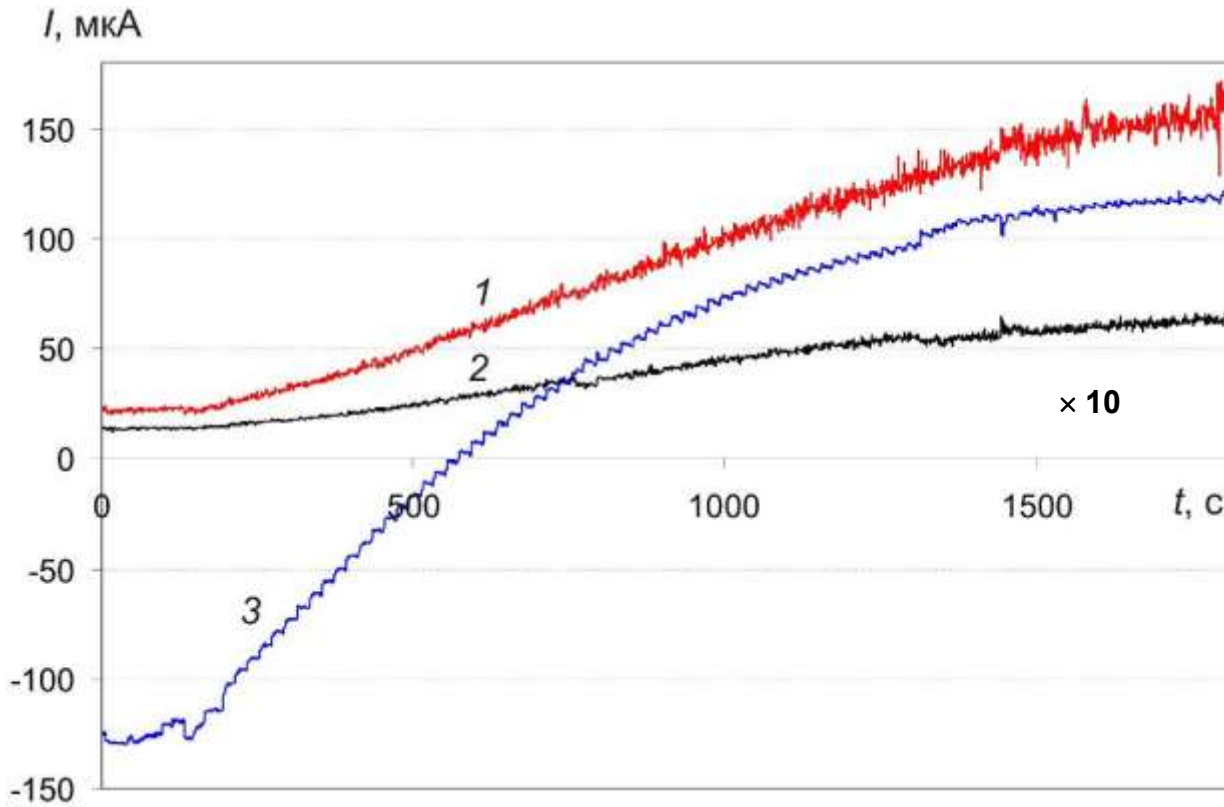
3rd common problem

Dose rate

D , $\mu\text{R}/\text{h}$



Current of positive ions

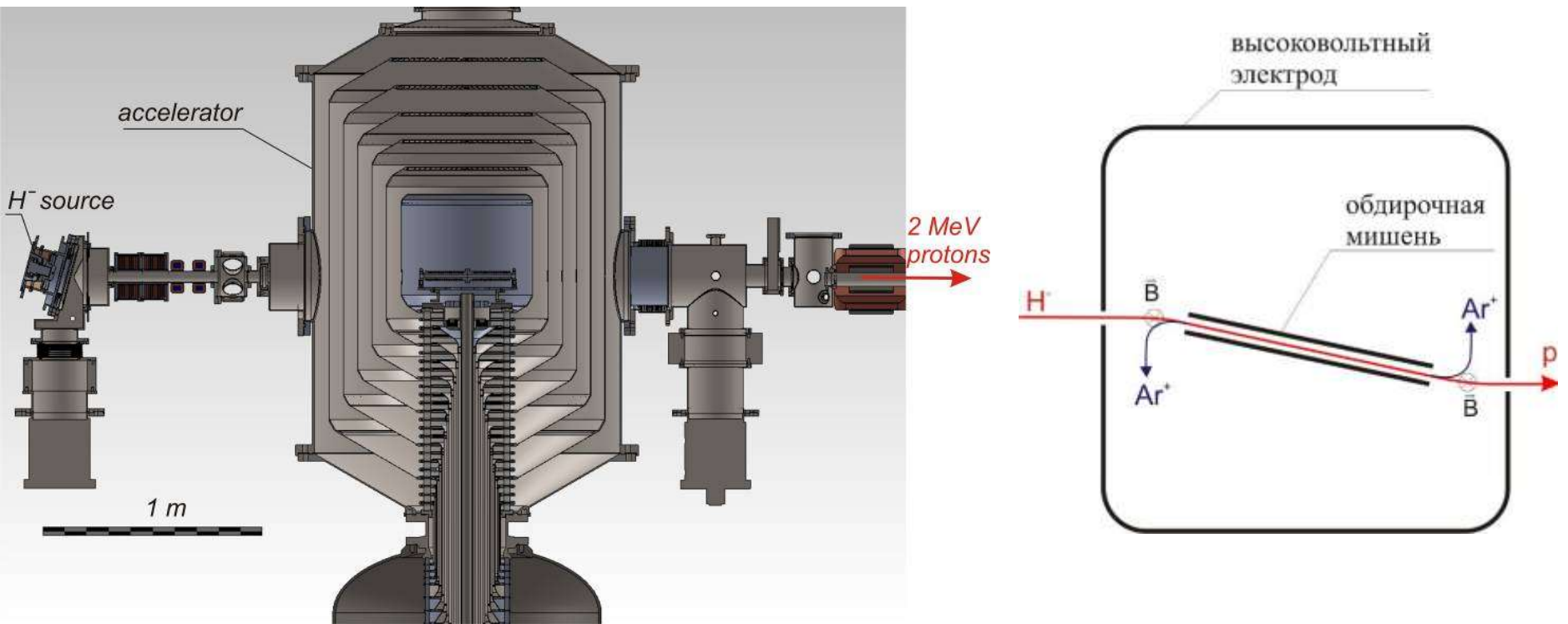


1 – внутренний диск
2 – внешний диск
3 – сетка
4 – инжекционное отверстие

1 – ток на внутренний диск
2 – ток на внешний диск
3 – ток ионного пучка на выходе
(уменьшен в 10 раз)

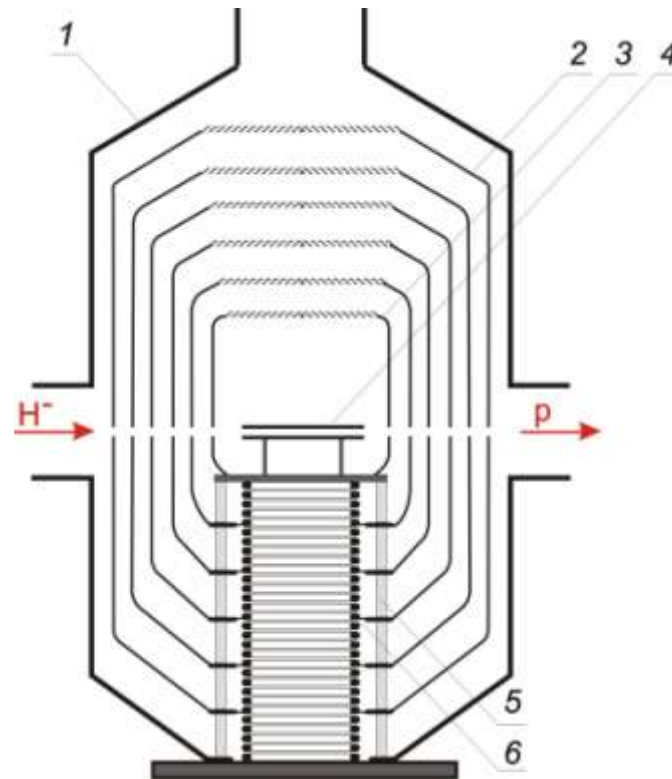
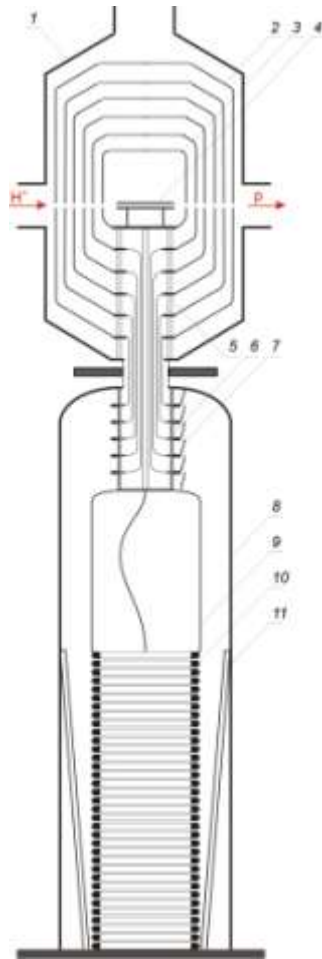
Fluxes of charged particles in accelerating gaps

- ☺ to install a cooling aperture and to put a cryopump at the input of the accelerator
- ☺ to reduce the gas flow to the accelerating gap from the stripper:
 - + to tilt the stripper
 - + to put the turbo molecular pump inside the high-voltage electrode



We propose a radical improvement of the accelerator concept.

It is proposed to abandon the separate placement of the accelerator and the power supply and connecting them through the bushing insulator.



The aim:

- ☺ 2.5 MeV 3 mA 1 h proton beam
- ☺ BNCT

