George Egely: Direct Electricity Production by catalytic fusion

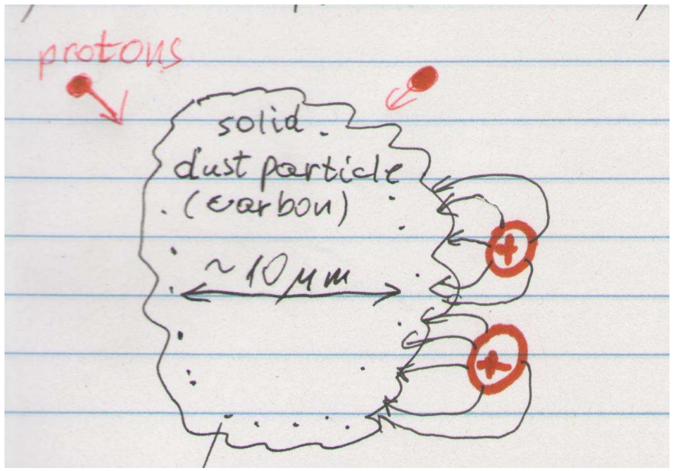
Results, tasks, problems

Forms of Fusion

	HOT			CATALYTIC			
	Inertial Confinement	Z pinch	Magnetic Confinement	phonon (Pons-Fleischman)	cavitation	**condensed plasmoid**	dust (resonant)
Result:	heat	heat	heat	heat	heat	**electricity**	transmutation
Cost:	$3x10^9$€	$1x10^9$€	$30x^9$€	1000€	10000€	**1000€**	2000€
	N.I.F.	SANDIA	ITER				
Fuel:	tritium	tritium	tritium	deuterium	water	**hydrogen**	carbon

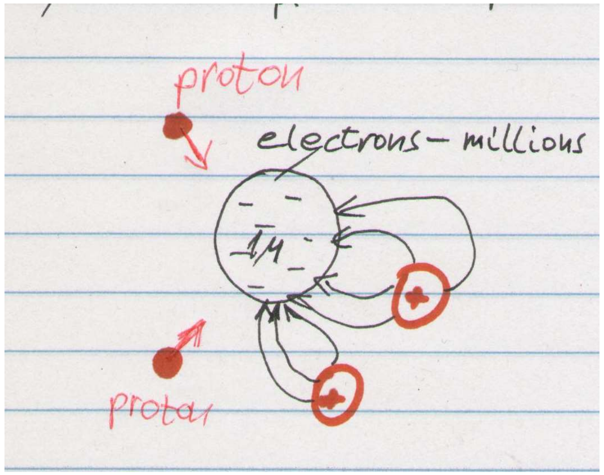
Principles of catalytic fusion
(by negative particles)

a) Dust in plasma



trapped electrons

b) Condensed plasmoids in plasma

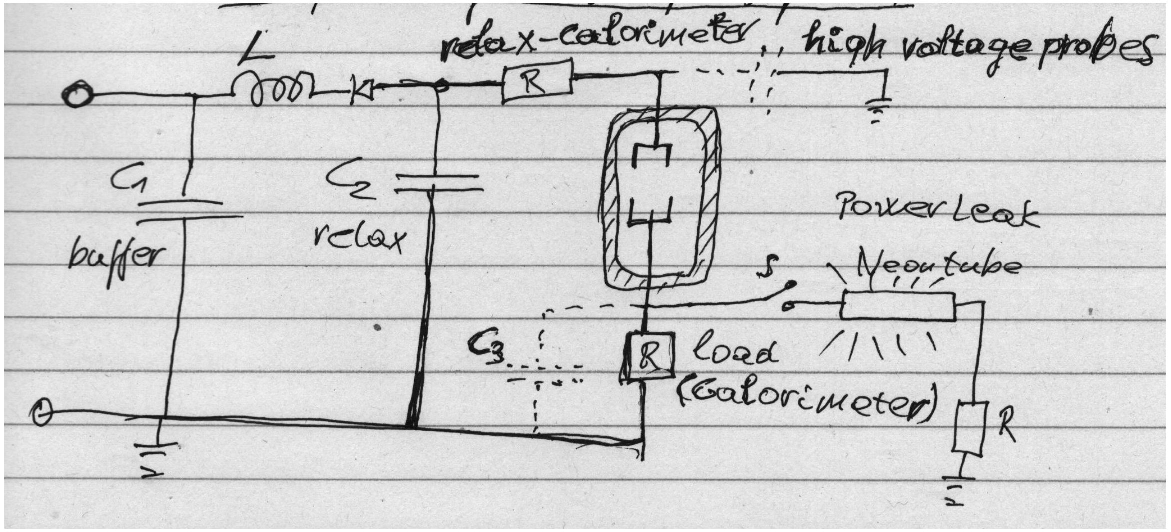


1.) Neutronss are generated: $p^{+} + e^{-} + V + 0.78$ MeV → n

2.) Heavy ions no longer repulse → due to charge screening (Coulomb barrier is overcame by static negative charge)

Layout of the simple system

relax-calorimeter high voltage probe



neon tube

The distribution capacity of the high voltage probes has an influence upon the transients.
The result of the process: high voltage pulses
Task: impedance matching

Catalytic fusion by nanoporous surface with condensed plasmoids

Adventages:

a) Inexpensive unit cost, under 100 €/1 kW (mass product)

b) Continous operation

c) Fuel: hydrogen/water vapour mixture
Thus this is a renewable fuel

d) Very good power/weight - portable units are possible

e) About 6 months of tube lifetime

f) Reprocessing is easy, very little waste. A 10 mikrometer thick surface must be renewed

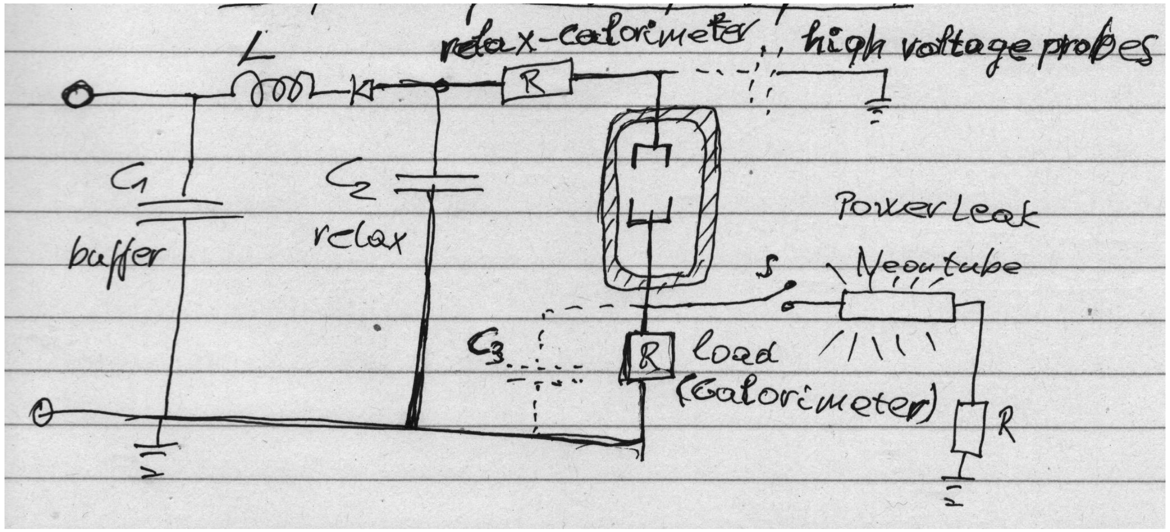
e) Electrodes are inexpensive

The simplest circuit:

a) Input side: relax oscillator

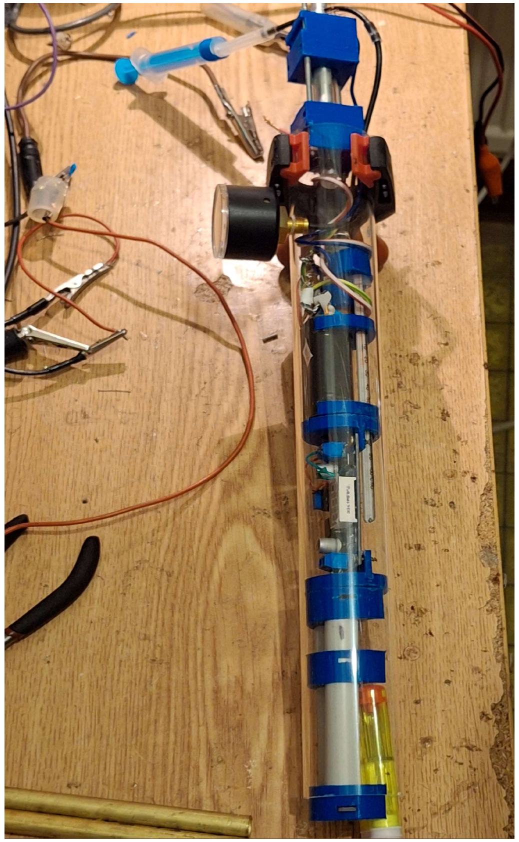
a) Reactor tube: coaxial cylinders

a) Load ohmic resistance
(See ICCF 24, 25)

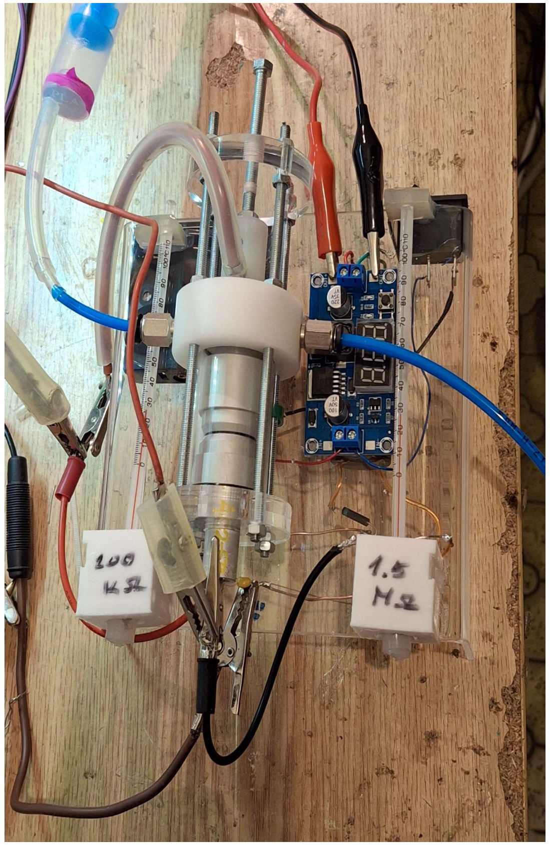


Photograps of the above assembly

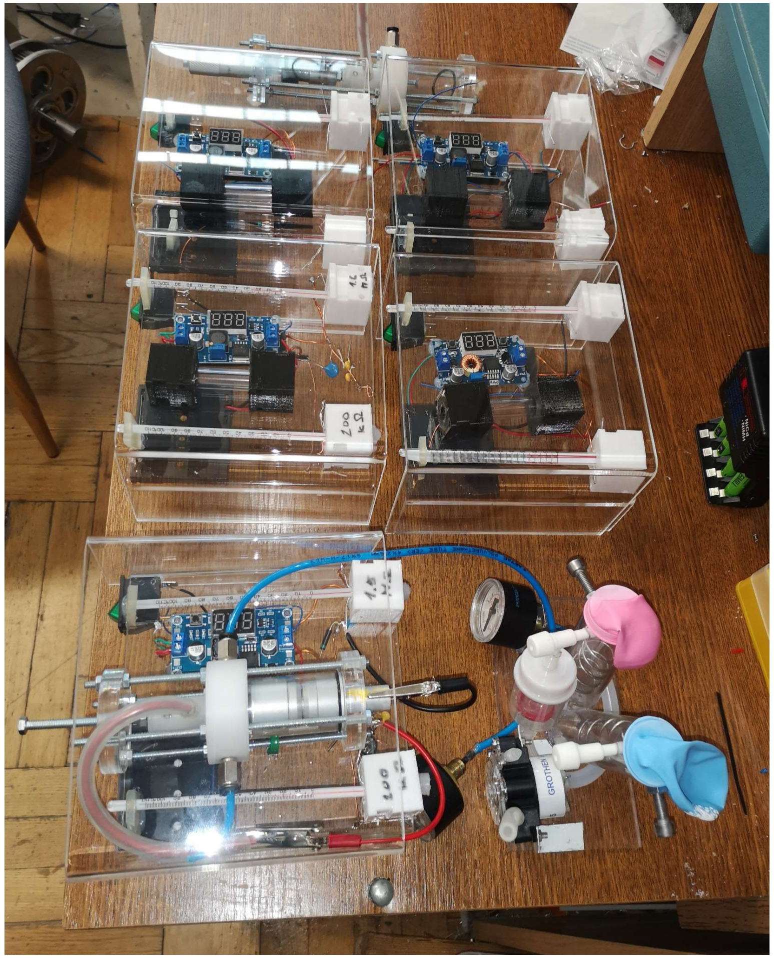
a) Compact tube



b) Flat version



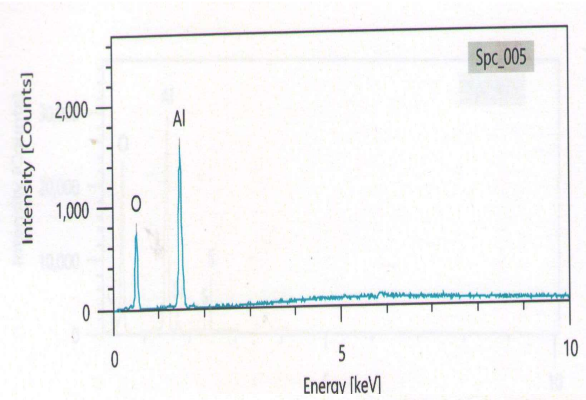
The reactors under assembly

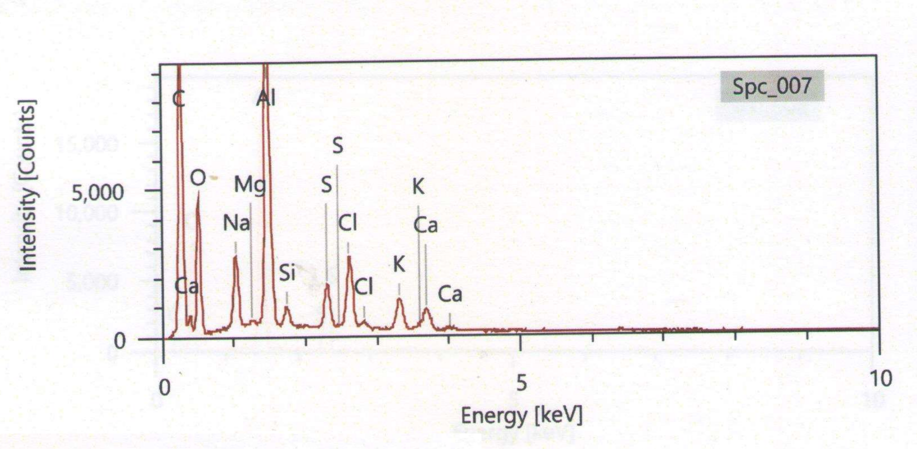


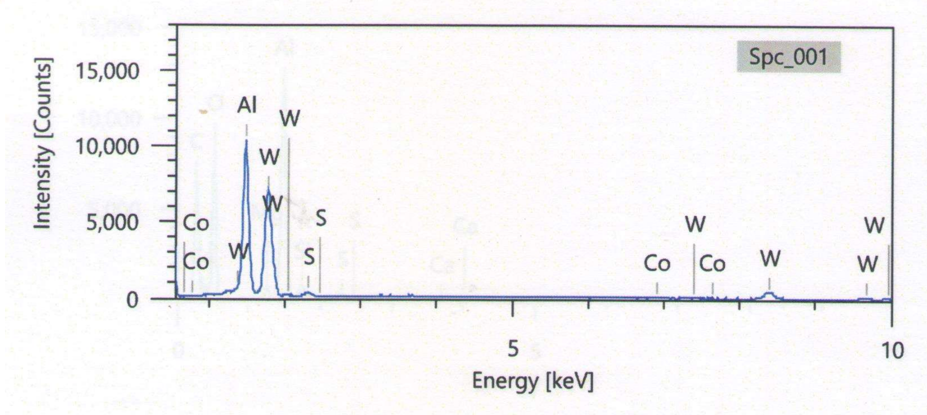
Fusion traces on the cathode:

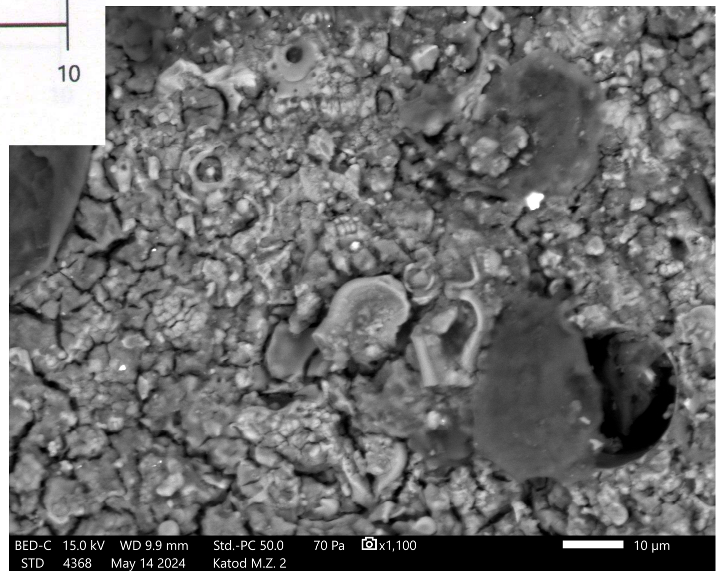
Carbon, Sulphur, Chlorine, even tungsten

Depends on the surface quality

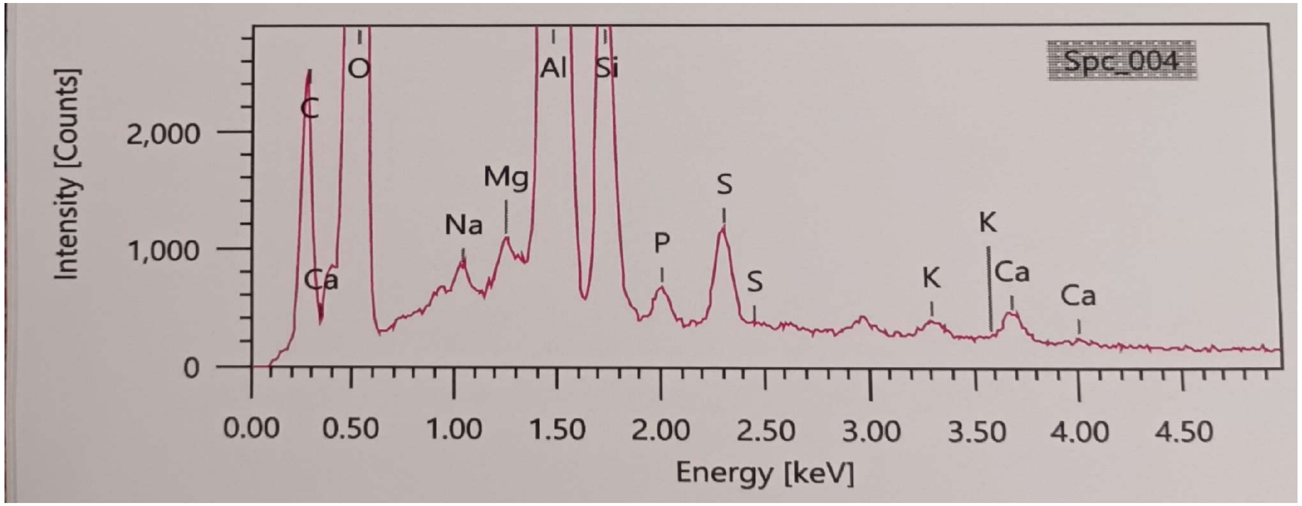


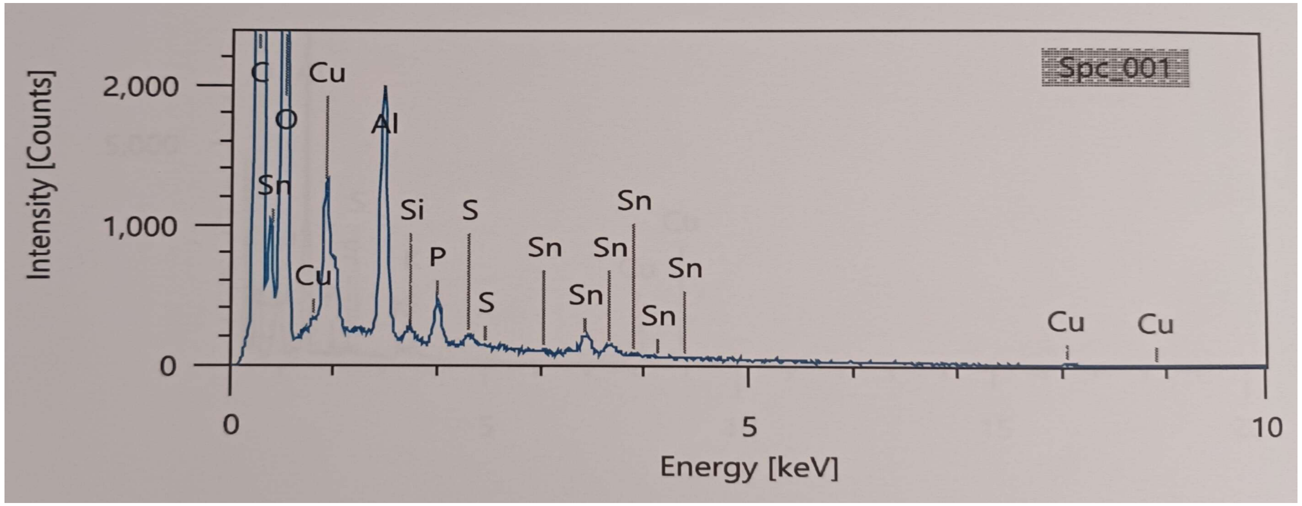






Plasma: wet air





Methods of energy balance tests

1.) To measure the heat of input resistor, form factor.
Ref. S. Domoszlai, ICCF 25, Sceczyn.

2.) Measure the average frequency of the discharge and measure the voltage of relax capacitor, $0.5 \cdot C \cdot U^2$ – average work/discharge.

3.) Output measurement: the dissipated heat measurements of calibrated output calorimeter.

Calorimeters and calibration

Calibration with DC power supplies

COP~ 2.5 to 3.

Power input

Problems to be solved

Three groups:

A) Quality contol

B) Reactor tube construction

C) Input/output electric circuit design

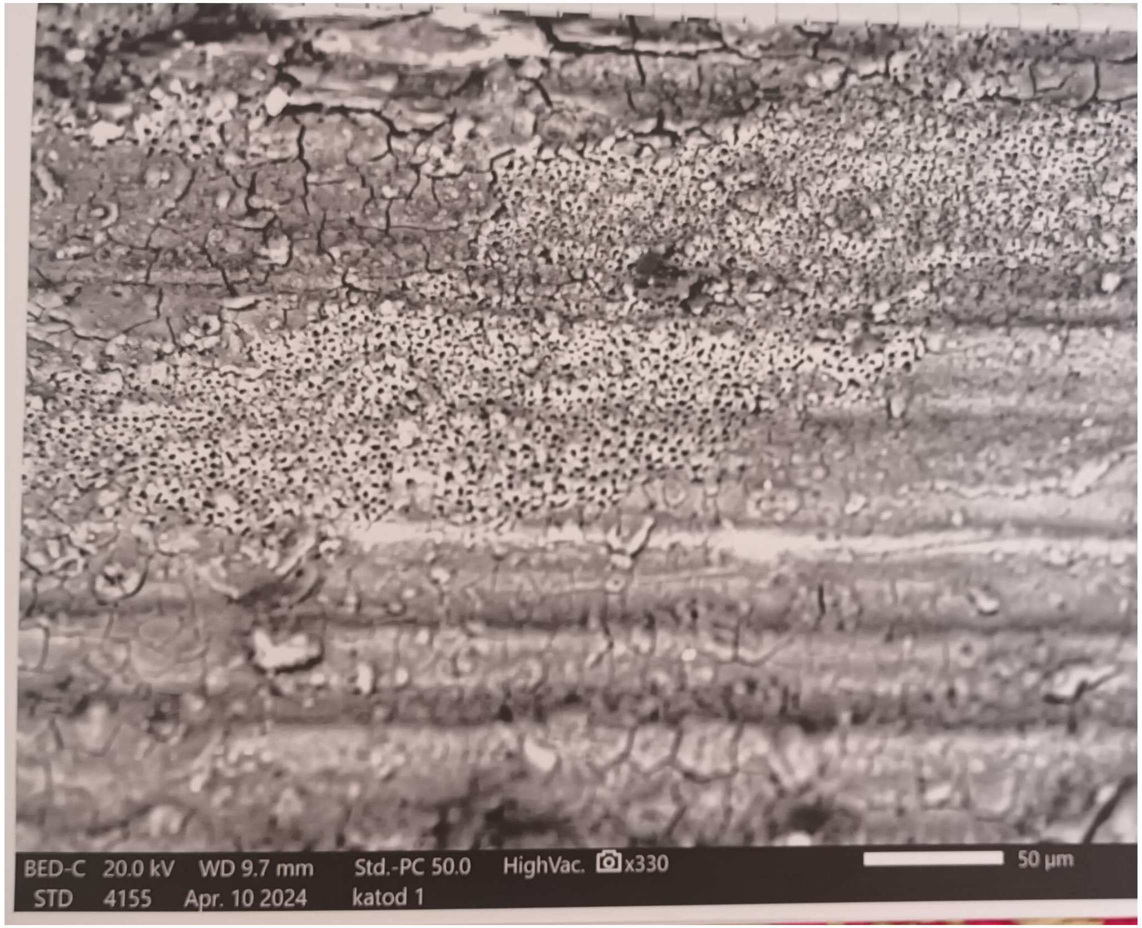
Quality control tasks – group A

a) Surface smoothness

a) Semiconductor composition and thickness

c) Surface priority, dielectric tensor properties

d) Feedback by scanning electron microscope

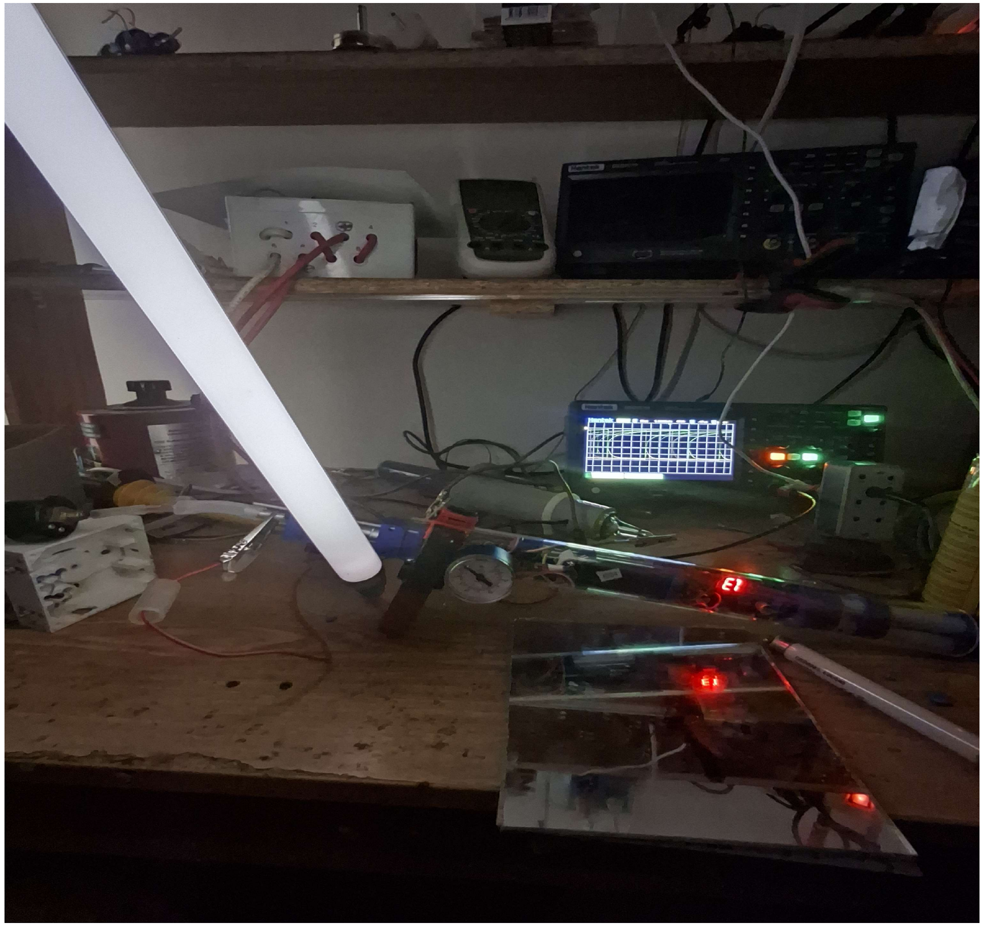


Quality control tasks – group B

a) Reactors with multiple electrodes

b) Storing condensed plasmoids

c) Capturing of longitudinal electric pulses
Now about 50% of output is radiated away



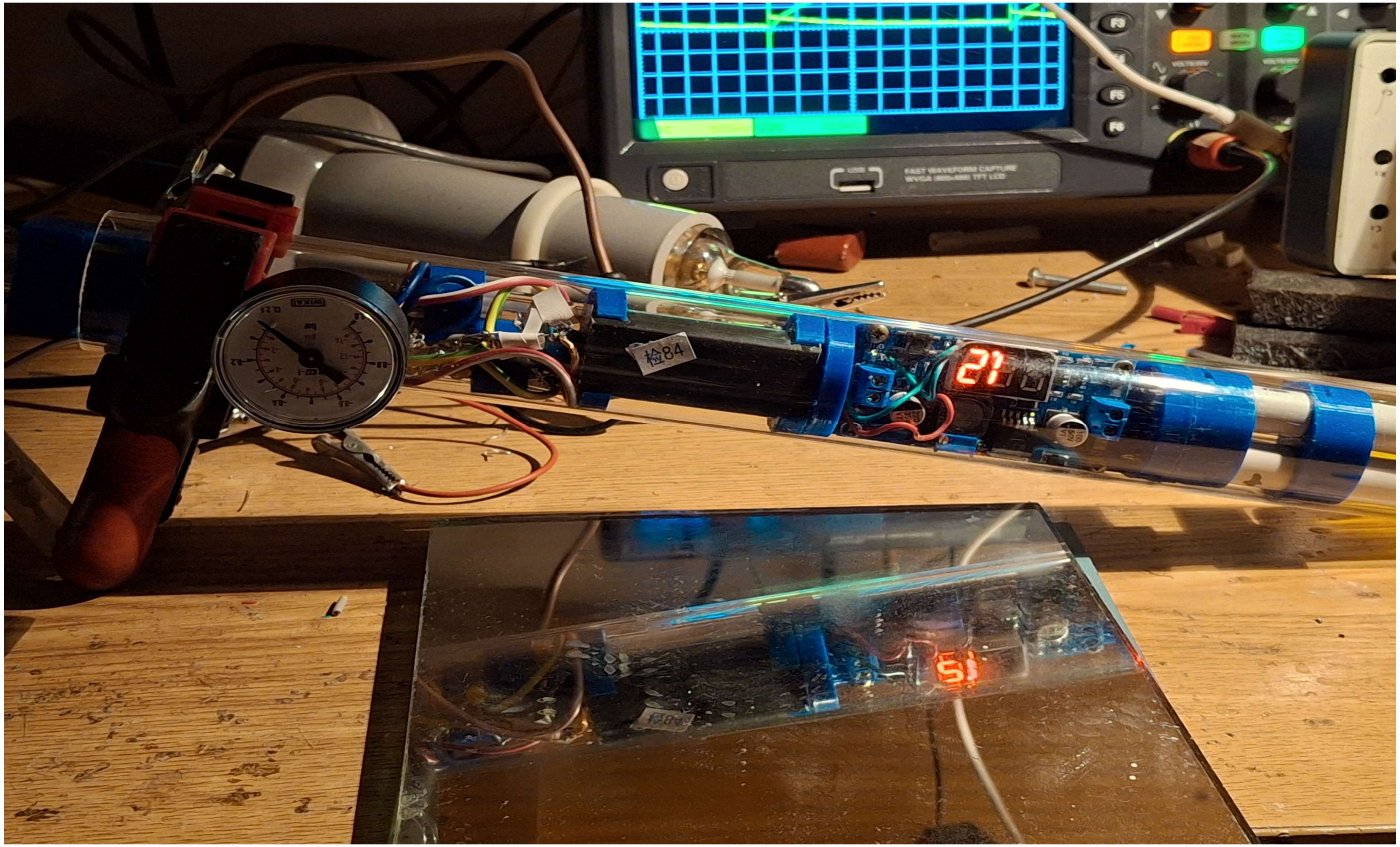
Restrictions of available test device parameters

a) High voltage, high frequency probes have formidable capacity and at 2-3 kV consume 0.5 W.

a) Neon tubes – used to detect energy leaking: consume power, of unknown amount.

a) Digital equipment are prone to damage due to high voltage pulses.

General view of test devices



How to improve power output?

1.) Limits to 10 W improved tube construction

2.) Limits to 100 W improwed quality control

3.) Limits to 500-1000 W reactor tubes: impedance matching plus all the above points

Change is inevitable…

Progress is optional…

Thank you for your attention!