ELECTRON CONDENSER
by

Ken Shoulders (1)

Abstract

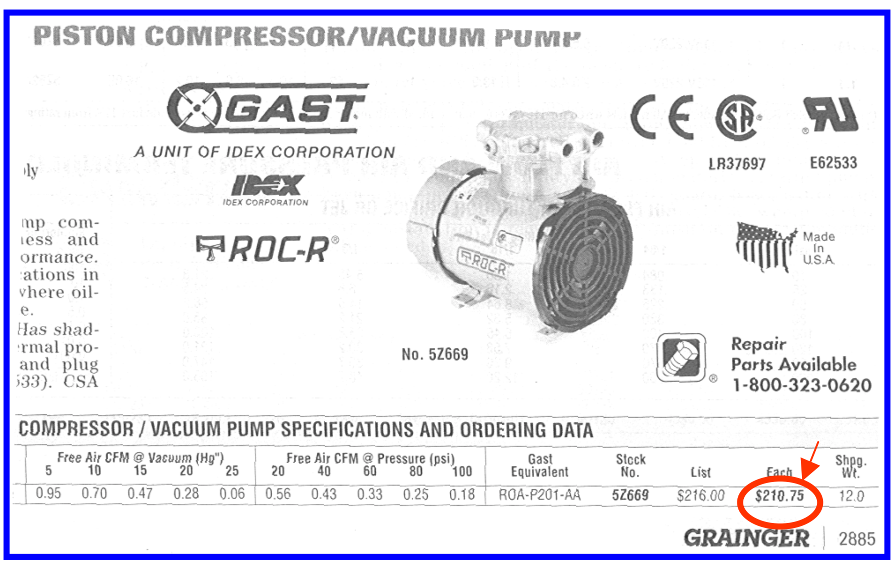
An apparatus is proposed for the condensation of electrons to a containable fluid state. This miniature apparatus consists of an ion pumped vacuum system, a split anode magnetron and a quadrupole electron trap fitted with suitable electron injectors, in the form of EVO generators, and numerous ways for analyzing the effluent captured in the trap. The apparatus design emphasizes simplicity and uses only minimal hand tools for construction. The cost of the easily found construction materials required is in the range of a few hundred dollars.

Previous writings by the author published on the web (2-12) show methods of clustering electrons along with some of their measured properties. These writings suggest that the preliminary condensation of electrons takes place during an electrical discharge to produce what is called an EV or EVO (exotic vacuum object) and that this stage can be carried to further condensation through the use of an electronic trapping technique to remove the velocity component acquired during the preliminary formation process. This velocity reduction promises to allow the association of sequential injections into the trap for consolidating large quantities of electrons in whatever state they take.

In this writing, the author will show that very new experimental scientific results can be acquired with simplicity and low cost, although this composition is only a brief introduction to the subject designed to engender feedback from others. In the future, details will be added according to responses received.

The writing will be broken into segments aligned with the various components used in the condensation process. These will be: (1) Vacuum system considerations, (2) Magnetron oscillator parameters, (3) Quadrupole trap parameters and (4) System operation.

Vacuum System
Although any conventional vacuum system will fulfill the requirements for electron condensation work, their cost is usually higher than necessary for the work to be done. The design submitted here works very well but it requires considerable attention to both operation and maintenance. The only reason for its introduction is the low initial cost incurred. The pump shown on the following drawings is an evaporation-ionization type. This pump does not start well at atmospheric pressure and it is necessary to add an inexpensive fore pump to reduce the pressure to about 1/50 of atmospheric pressure. These pumps can be purchased for about $220.00 from local vendors. One such pump is shown in the clipping below:



Free Air CFM @ Vacuum (Hg") 5	10	15	20	25	Free Air CFM @ Pressure (psi) 20	40	60	80	100	Gast Equivalent	Stock No.	List	Each	Shpg. Wt.
0.95	0.70	0.47	0.28	0.06	0.56	0.43	0.33	0.25	0.18	ROA-P201-AA	5Z669	$216.00	$210.75	12.0

The ion pump works by virtue of an electrical discharge capable of melting and evaporating a chemically active material like aluminum. As shown in the figures on pages 5, 6 and 7, a cathode of carbon, obtained from a battery electrode, is lowered onto the aluminum slug held in the carbon anode crucible. With a voltage of about –4 KeV applied to the cathode, generated by rectifying a high frequency type of neon transformer, the discharge is struck by using the simple cam operated manipulator shown. When the aluminum reaches a high temperature it evaporates and deposits on the walls of the water-cooled enclosure. The combination of chemical activity and ion pumping lowers the pressure in the chamber to the operating level. The correct operating pressure level is known from the measurement of current in the anode line to ground. Once the pump is started and reaches low pressure, the gap between anode and cathode must be increased by manipulation. Prolonged operation produces deposits on the wall that eventually peel off in flakes that must be periodically removed.

The vacuum chamber is made from pottery grade porcelain with care being taken to avoid porosity even if necessary to glaze on the inside. Any amateur potter can make the shapes required here as the kiln only costs about $280.00 for the small size required and clay is both easy to fabricate and dirt-cheap. The rotary seals used for manipulation are the ground and lapped type greased with Dow Corning DC 4 silicone stopcock grease that was used successfully for many years in older science laboratories. Although the top glass cover is shown to be a ground type of seal, it is not difficult to cut a groove in the top of the vacuum chamber and insert an O ring for sealing. This makes frequent removal easier. Although not shown in the attached drawings, the manipulation knob seals must be held against the vacuum chamber body by spring force. Additionally, for simplicity, the pin/slot flexible shaft connection detail is not shown on the knobs. Using a pottery vacuum chamber is very handy because electrodes can be installed through the wall at almost any location by gluing them in with epoxy.

Magnetron

The type of magnetron used here is a split anode magnetron, one of the first magnetrons invented. It is not likely to be more than 50% efficient, but that is adequate for the present use. The magnets in it are sintered, rare earth magnets and can either be taken from speakers or purchased new at low cost. Typical operating parameters for this magnetron are: Filament voltage 2 volts with a filament current of about 15 amperes using a tungsten welding electrode of small diameter. The anode voltage is –4 KeV applied to the cathode at a current of about 50 milliamperes.

A shorting strap for coarse magnetron tuning is located on the ¼ wave line connected between ground and the split anode. The rough setting is for 2.45 GHz, in the microwave oven band, as indicated by nulls on a transmission line measurement. For fine-tuning, a small variation in capacity anywhere along the magnetron line is effective. Fine-tuning is essential because the ¼ wave co-axial resonator feeding the trap is not tunable. There is a magnetic coupling loop provided between the magnetron line and the co-axial resonator to supply energy to the resonator.

A kitchen microwave oven can be used if one is willing to undertake necessary modifications. In this case, a co-axial transmission line is needed to connect with the co-axial ¼ wave line feeding the trap.

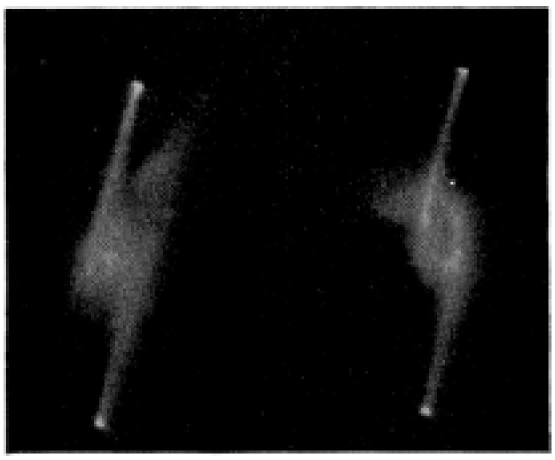
Quadrupole Trap

At the high impedance end of the ¼ wave co-axial line there is a small cylinder that receives essentially all of the step-up voltage from the line. This cylinder, in conjunction with the grounded end plates constitutes a Paul type of quadrupole electrodynamic trap so often used for high quality ion mass spectrometry. It functions the same way for trapping electrons although it is rarely used because, after all, how many e/m states are there for electrons. We are about to see if there are any coupled states of interest in the trapping of EVO structures having electronic properties.

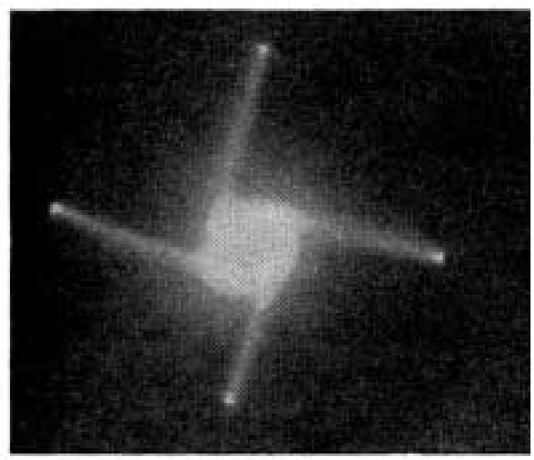
In order to provide versatility for analyzing the properties of trapped EVOs, the end caps of the trap have independent manipulators on them for switching in various apertures, excitation electrodes, EVO injectors, extraction electrodes and optical analysis ports to determine the charge state within. The optical windows are not shown in the enclosed drawings but they are easy to add simply by gluing on homemade Brewster windows.

The key to efficient trapping of EVOs is to utilize good EVO gun injectors capable of depositing EVOs in the center of the trap at low velocity. Many years ago, Winston Bostick [13] published some photos taken of plasma rail guns firing across a chamber maintained at low gas pressure. Winston was a magnetic enthusiast and so he fired them across a magnetic field. The same thing happens if you don't use a magnetic field. In the early 50's when Winston did his work, he did not know that EVs were the main component of his plasmoids. Years later, when I employed him as a consultant on EV technology, he came to see the effect and love it. Two of his early photos showing interaction from both 2 and 4 sources are taken from the above reference and shown below:

Two plasmoid sources spaced 10 cm apart firing across a magnetic field.



Four plasmoid sources spaced 10 cm apart firing across a magnetic field.



In both cases, the guns were purposely misaligned to show the attractive force between the plasma structures. With modern EVO guns, much better aiming is available from small units that operate very efficiently thus allowing more tricks yet. At this time, it is not known what the optimum configuration for an EVO gun will be for this application.

System Operation
Although it should be self-sufficing, a quick run through operating procedures is presented below:

- The chamber is roughed down with either a mechanical pump or a water ejector pump.
- Striking the discharge and raising the aluminum to its evaporation temperature starts the high vacuum cycle.
- After the pressure lowers, as indicated by the anode current, the discharge current is reduced by raising the cathode.
- The magnetron filament is first turned on and then the high voltage is applied to the cathode.
- The microwave amplitude is measured using a probe and detector placed near the trap to confirm the trap is properly tuned. If not, the magnetron is fine tuned to peak the output.
- For the first tests on electrons only, a small, broken flashlight bulb filament is used as an emitter placed outside of one trap end cap. Effective trapping is indicated by the ability to store electrons, which is in turn, seen as a current spike on one of the end cap electrodes when the microwave drive is turned off.
- The EVO sources, basically just a pair of wires driven by a short pulse from a spark gap, fired simultaneously by series operation, are run for a short period of time.
- Applying an extraction voltage to one end cap tests the trapping efficiency by allowing whatever is stored to register as an EVO strike on a witness plate located either on or slightly beyond the electrode. Increased energy of the strike with increased time of trap filling indicates trapping success.
- Further analysis of the trap contents can be done with increasingly sophisticated methods of excitation and extraction with the aim of collecting the effluent in a portable container that is static.

References

[1] Ken Shoulders, 365 Warren Dr., Ukiah, CA 95482 (707) 467-9935, e-mail at: krscfs@svn.net

[2] U.S. Patents on EV technology by K. R. Shoulders. 5,018,180 (1991) - 5,054,046 (1991) 5,054,047 (1991) - 5,123,039 (1992), and 5,148,461 (1992).

[3] K.R. Shoulders, *EV--A Tale of Discovery*, Austin, TX, 1987. A historical sketch of early EV work having: 246 pages, 153 photos and drawings, 13 references. Available from the author at: 365 Warren Dr., Ukiah, CA 95482 (707) 467-9935, e-mail at: krscfs@svn.net

[4] Ken Shoulders and Jack Sarfatti, "Energy Conversion From The Exotic Vacuum—Revised". Published on the web during June 2004 at: http://www.svn.net/krscfs/.

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[9] Ken Shoulders, "Low Voltage Nuclear Transmutation". A poster presented at ICCF-10 can be downloaded from: http://www.svn.net/krscfs/

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[13] Winston H. Bostick, "Experimental Study of Ionized Matter Projected Across a Magnetic Field", Physical Review, Vol. 104, No. 2, Oct. 15, 1956.

[14] Dr. Jack Sarfatti, "What is the Universe made of?" Presented at GR 17 Dublin 2004 http://qedcorp.com/destiny/warpdrive.pdf

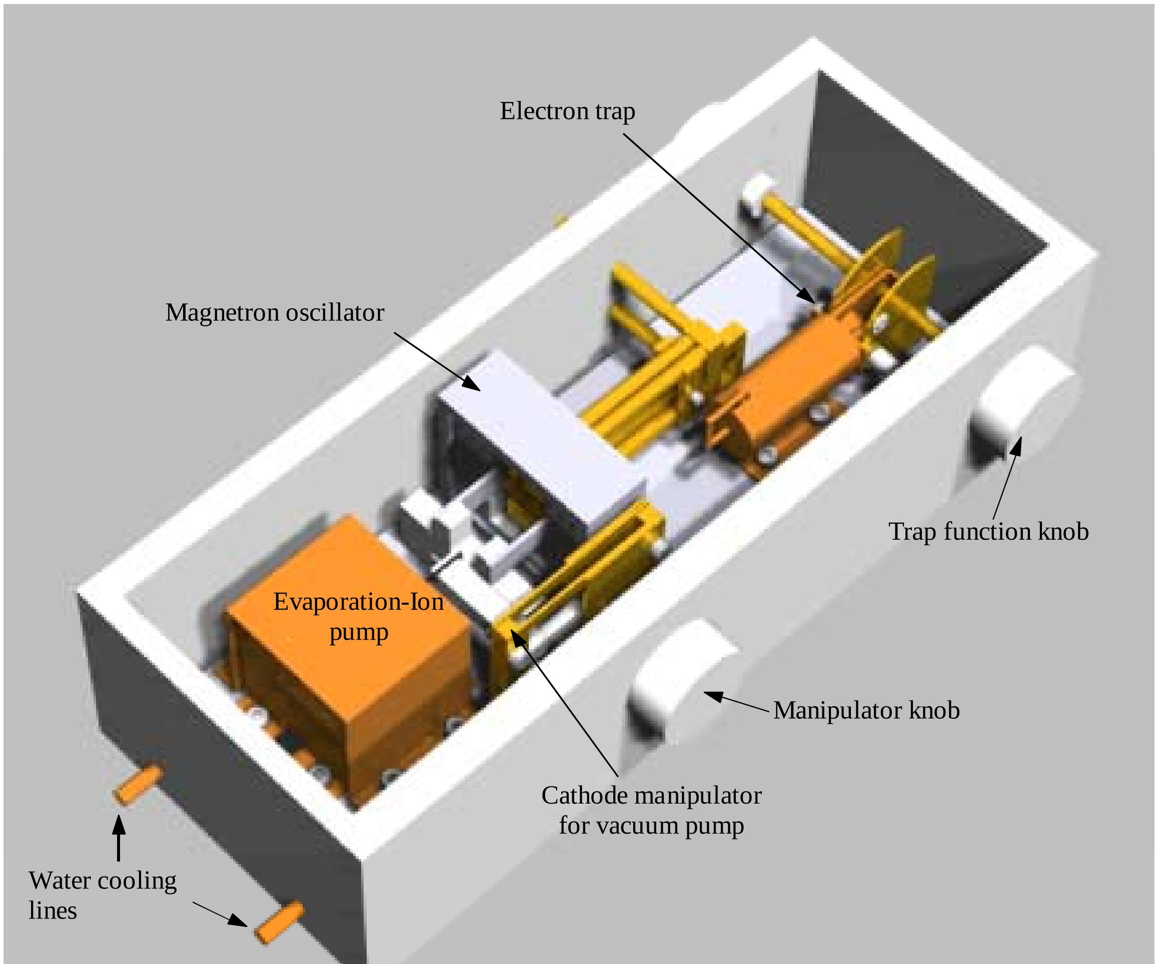

Electron trap
Magnetron oscillator
Trap function knob
Evaporation-Ion pump
Manipulator knob
Cathode manipulator for vacuum pump
Water cooling lines

Fig. 1

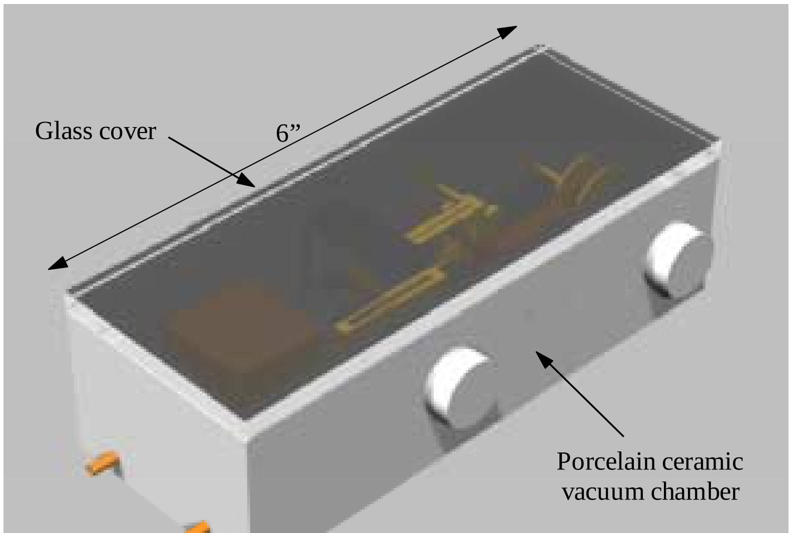
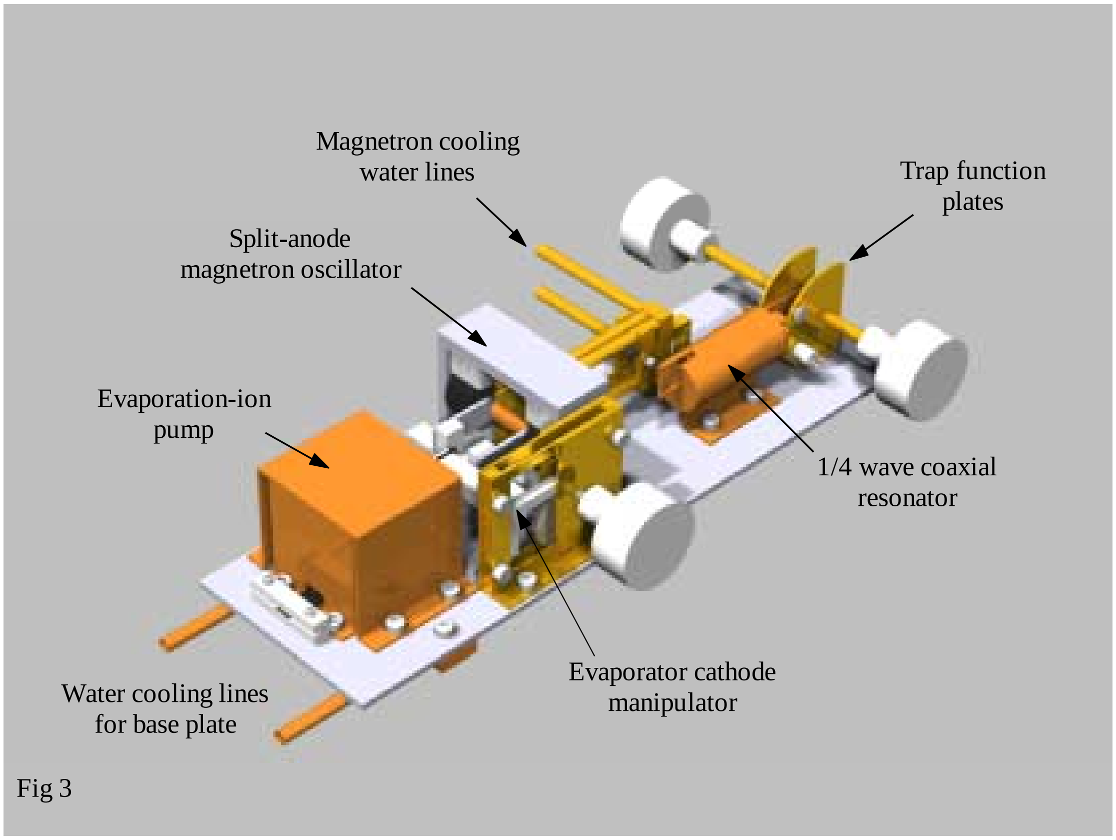
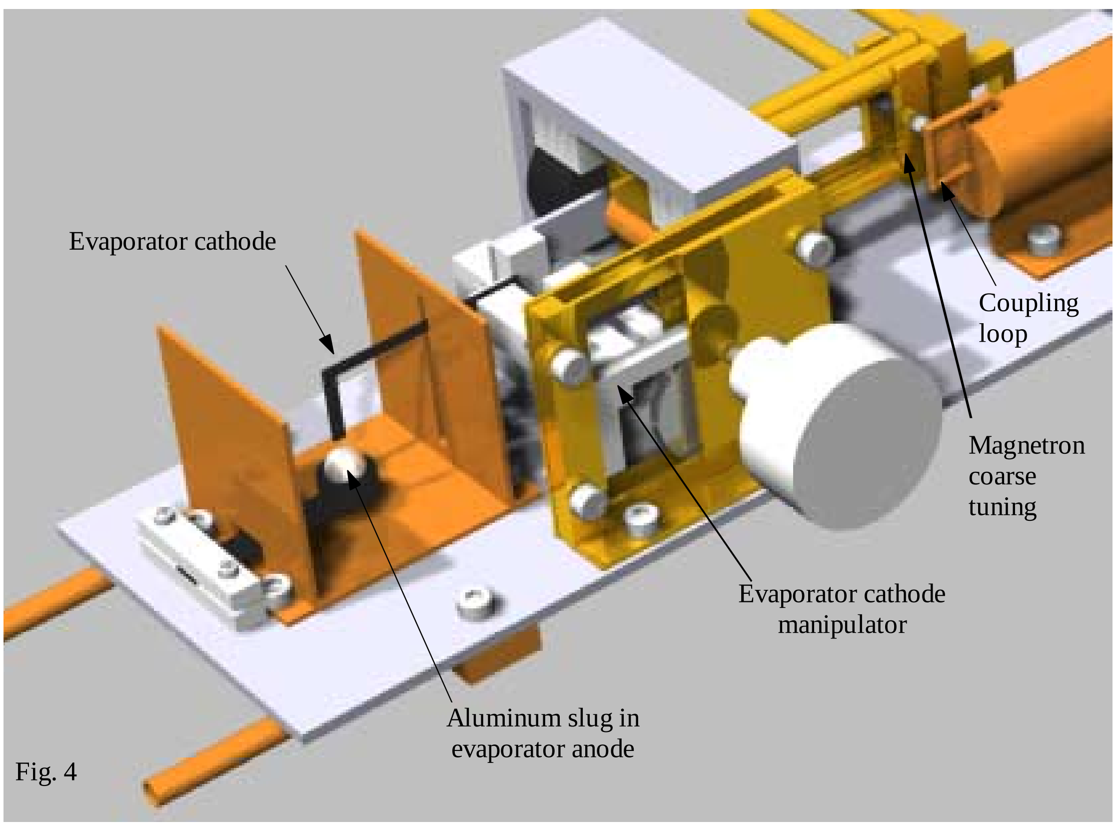

Glass cover
6”
Porcelain ceramic vacuum chamber

Fig. 2


Magnetron cooling water lines
Trap function plates
Split-anode magnetron oscillator
Evaporation-ion pump
1/4 wave coaxial resonator
Evaporator cathode manipulator
Water cooling lines for base plate
Fig 3


Evaporator cathode
Coupling loop
Magnetron coarse tuning
Evaporator cathode manipulator
Aluminum slug in evaporator anode
Fig. 4

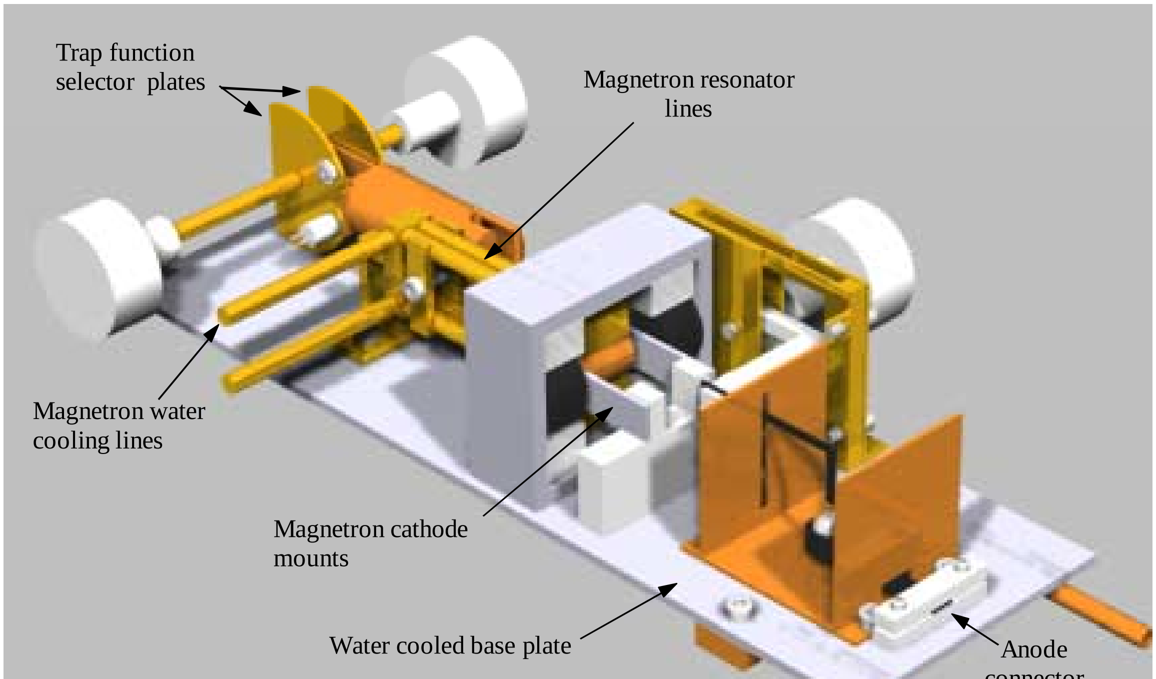

Trap function
selector plates
Magnetron resonator
lines
Magnetron water
cooling lines
Magnetron cathode
mounts
Water cooled base plate
Anode
connector

Fig. 5

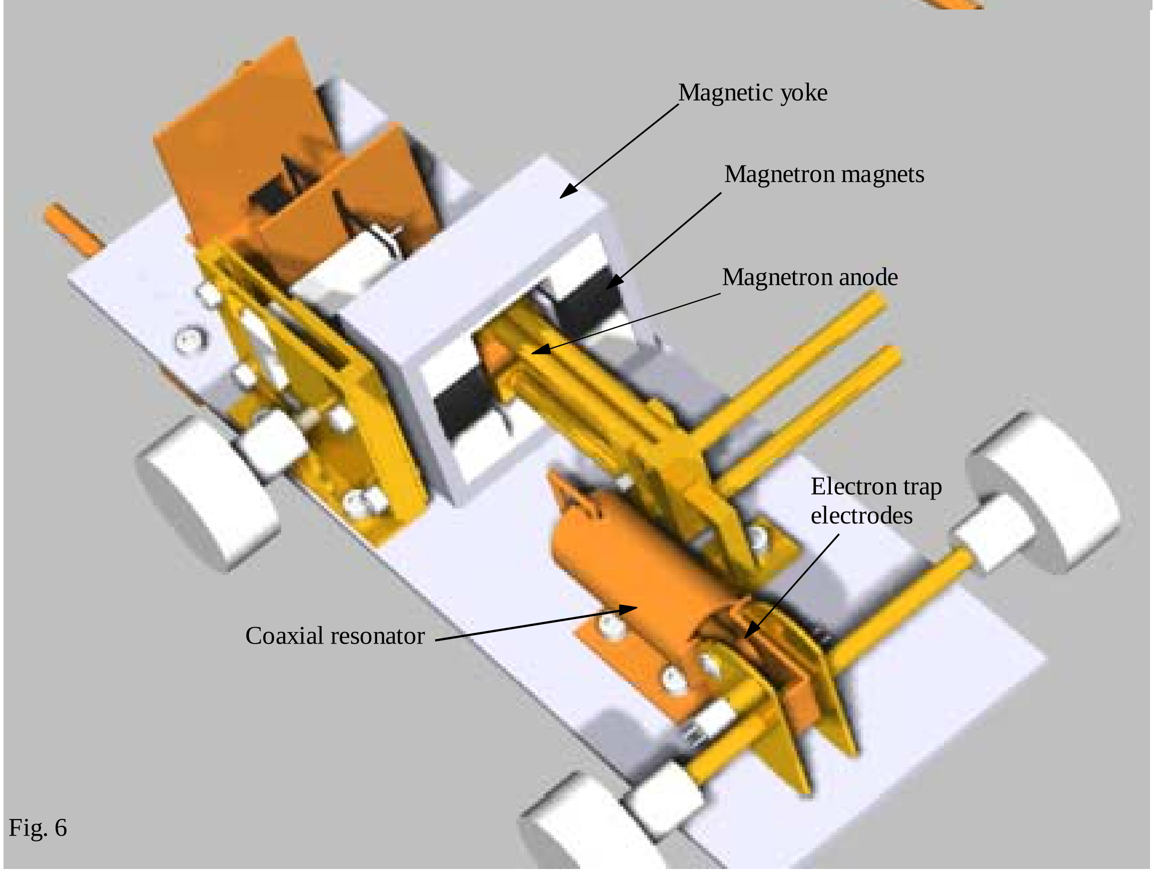

Magnetic yoke
Magnetron magnets
Magnetron anode
Electron trap
electrodes
Coaxial resonator

Fig. 6