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Proposed Mechanism for the E-Cat SK (TheFutureIsNow)

Posted on January 10, 2019 • 5 Comments

The following comment was posted on the Journal of Nuclear Physics by TheFutureIsNow, and the poster subsequently made contact with me and gave me permission to repost it here. I was able to ask some follow-up questions to which he provided responses.

For a little context, TheFutureIsNow had previously asked Andrea Rossi if he had observed plasma balls in the E-Cat, and Rossi responded "yes".

TheFutureIsNow

January 9, 2019 at 1:10 PM

Dear Andrea,

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Through my online research I've discovered that the existence of a fire ball (plasma ball) with a double layer on the surface (protons in the interior and electrons on the outside) is critical for the negative resistance phenomena to take place. The plasma ball acts almost as a capacitor or a source of energy to sustain the negative resistance. During this same time period, the plasma ball sustains itself by absorbing radiant energy (mostly heat) from the general plasma environment and begins to produce a self-generating oscillation. This oscillation is basically the conversion of heat into electrical current by the plasma ball.

Due to the production of anomalous energy (in various forms) allegedly generated by a number of different devices producing plasma balls, it is logical to assume that in addition to zero point energy extraction LENR reactions are taking place near the double layers where positive ions and electrons can interact. If this is the case, this amazing self organizing plasma structure in the QX would take the heat generated, convert it to electrical current, and project this electricity through the discharge. A portion of this electrical current (perhaps a significant amount) is converted in the general plasma into heat and light! What remains can be collected as electricity.

No steam boilers, no thermo-electric panels, no photothermalvoltaic devices with tiny gaps: the plasma ball ON IT'S OWN converts the heat generated by LENR into electricity. The light and heat are primarily massive losses, but future versions of the QX could be designed to minimize the production of heat/light and boost direct electrical output.

So fundamentally to maximize the energy produced by the plasma ball (if LENR produces a significant portion of the

heat) the proper fuel mixture should be utilized. The first step seems to be choosing one or more noble gases. Argon is obvious the FIRST choice. However, additions of other gases like neon could also optimize the formation of the plasmoid.

Next, once the noble gases have been selected, we need to look at the fuels that would be undergoing nuclear reactions. The two most obvious that come to mind are hydrogen (protium with no neutrons) and deuterium (with a neutron). My understanding is that deuterium has a higher cross section for nuclear reactions than hydrogen. Moreover, in spinning up the plasmoid, adding some quantity of deuterium would allow for another layer of positive ions to form with a different mass.

Finally, we need to think about what the hydrogen and deuterium would interact with, in addition to possibly themselves. My guess is that lithium is an ideal fuel for a number of reasons. Basically, in a large number of experiments by different parties, it seems to be susceptible to nuclear reactions with hydrogen/deuterium at very low energies (a few hundred eV) far below what is predicted by traditional nuclear physics (hundreds of KeV minimum). Another fuel that should not be totally ignored are the NANO-PARTICLES produced via sputtering from the electrodes. These metal particles of nickel, manganese, or potentially even other metals such as platinum could also undergo nuclear reactions, although at a lower rate than lithium.

Everything else is basically about helping sustain resonance (design of the power supply so it acts like a tank circuit), possibly applying low powered frequencies to the plasma ball after the initial pulse to help sustain it, and to keeping the

plasmoid free floating and away from the electrode surfaces which would produce massive erosion.

Q: Where is documented the existence of a fire/plasma ball with a double layer?

A: There are an abundance of mainstream scientific papers that describe the production of “fireballs” or “plasma balls” in DC plasma discharges during the transition to a negative resistance zone in which a reduction in voltage can lead to an increase in current. These papers also describe how the fireballs (basically macroscopic plasmoids) have a double layer consisting of interior positive ions and exterior electrons. The various conditions by which these fireballs can be produced and how they can be manipulated is also discussed.

Here are some selected links:

“Comparative studies performed on “fireballs” formed in direct current and high frequency discharges”
by M.Sanduloviciu, C.Borciat, V.Melnig and C.Gherman
<https://apps.dtic.mil/dtic/tr/fulltext/u2/a357742.pdf> (see p. 172 of this document)

“Mechanism behind self-sustained oscillations in direct current glow discharges and dusty plasmas”
by Sung Nae Cho
<https://arxiv.org/abs/1302.7041>

“Negative Differential Resistance of the Discharge Plasma through Fractal Space-Time Theory” by Maricel Agop, Dan G. Dimitriu, Silviu Gurlui
http://www.cmsim.org/images/1_CHAOS2012_Proceedings_Papers_A-B.pdf

Q: What do you think causes negative resistance?

Negative resistance is caused by the creation of a plasmoid or fireball in the creation of an arc discharge. The double layer becomes a source of ions that can feed the plasma and allow for the negative resistance to take place. If it were not for the plasma ball, there would be no negative resistance.

Q: What is meant by a “double layer” and why do you think it is significant?

Any transition from a glow discharge to a true arc discharge (with positive resistance) will require the discharge going through a negative resistance zone. Mainstream scientists are now able to explain how the double layer of a fireball or column of plasma is what provides the energy that powers the negative resistance. Without such a fireball, the negative resistance would not take place. Basically, the fireball is constantly absorbing radiant energy (such as heat from the plasma) and storing it up like a capacitor and then discharging it to allow for the negative resistance effect. The double layer is the portion of the fireball that interacts with the overall plasma in the tube. When it comes to LENR, the double layer of such a plasmoid is where nuclear reactions can take place. The heat from the reaction is then absorbed by the fireball which then transforms it into electrical current. These “self sustaining oscillations” can then produce electricity, heat, and light.

Q: What do you think is the difference between zero point energy and LENR?

3) Zero Point Energy and LENR are two different phenomena but they may possibly both take place in reactors like Andrea Rossi's SK. Zero Point Energy could be defined as energy extracted from the vacuum of space which is filled with limitless energy. Some calculations have been made by cutting edge scientists like Harold Puthoff that a tiny area of

empty space (for example the space in a coffee cup) contains enough energy to boil away all the world's oceans. LENR energy could be defined as energy collected after matter is made to undergo nuclear reactions. However, in the conditions present in the SK, both types of energy could plausibly be produced. For example, some researchers in the field of zero point energy claim that sudden non-equilibrium and non-linear motions of electrically charged particles (ions) can cohere the active vacuum which results in electron-positrons pairs being extracted. The positrons could then annihilate with electrons in the environment to produce energy. However, this is only one mechanism by which it's plausible that energy could be extracted from the vacuum.

Q: Where do you think the excess energy in LENR comes from?

I think the excess energy comes from both nuclear reactions (probably the bulk of the energy) and potentially the extraction of electron-positron pairs from the active vacuum. In the E-Cat SK, the non-linear and non-equilibrium conditions involve sudden accelerations of ions that may allow for the vacuum to be manipulated. My guess is that in the future we will be able to design LENR systems to control the ratio of power extracted from LENR reactions vs. the vacuum.

← IEEE-Madison (Wisconsin) to hold Meeting on LENR on Jan 31st to View E-Cat Presentation

Multitude of Nuclides Arising in the Process of Cold Nuclear Transmutations Involving Electrons (New Parkhomov Paper) →

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Oystein Lande • 3 years ago

Can anyone explain to me the non-Scientific term "negative resistance" ??

This means reduced resistance? increased current flow?

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Jouni Tuomela ➔ Oystein Lande • 3 years ago

yes. But I would like someone explaining more, now I think it is involved in plasma zones. Ouch this is not so easy for me.

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Bruce_H ➔ Jouni Tuomela
• 3 years ago • edited

The concept of negative resistance that I know has to do with the response of a circuit to AC stimulation.

If the frequency of the AC input to a passive circuit is very low then the response will be almost purely resistive ... i.e., the voltage (V) across a circuit in response to a current (I) sent through it will closely follow Ohm's law ($V = IR$) where R is the resistance. This says that if you increase the current then the voltage will increase.

If, however, instead of a DC input you have an AC input the response can become more complex. In particular, there can be a phase delay in the output. For example, when the input begins the rising phase of its cycle the output may lag by a bit and may not yet be rising. Now for certain circuits and for certain input frequencies, this phase lag may be substantial -- more than a quarter cycle. If this happens then when the input is

cycle. If this happens then when the input is goes up the output can still be going down and vice versa. This is the reverse of Ohm's law looks like a the resistance has acquired a negative sign. Under these circumstances engineers loosely talk about a negative resistance (actually, the real term is "negative impedance" where "impedance" is a frequency-dependent counterpart of resistance).

The important points to note here are 1) this is not something extremely exotic, it is an ordinary part of the behaviour of any resonating circuit and 2) this whole negative resistance idea is not a part of DC analysis , i.e., it is a characteristic that is only defined for responses to fluctuating inputs.

Plasma columns exhibit resonance and "negative" resistance. I'll try and find a paper describing this if you like.

1 ^ | v • Reply • Share ›



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Dave Lawton ➔ Guest • 3 years ago

A good example is the tunnel diode.<https://www.youtube.com/watch?v=PuG...>

#204: Basics of Tunnel Di...



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Axil Axil • 3 years ago

Rossi has stated that the QX and SK are covered by his patent. His patent requires that his fuel is used in the reactor. I therefore believe that the balls of light are produced by his fuel that Rossi uses to produce the plasma when the initial high voltage arc vaporizes the fuel. The EVOs in the fuel are not vaporized but every other component in the fuel is. The balls of light must come from the EVOs that are manufactured when the fuel that Rossi makes is created.

2 ^ | v • Reply • Share ›



TheFutureIsNow • 3 years ago

Frank Acland saw a plasma ball in the QX that persisted between the electrodes. Even more significantly than that, virtually every other alleged "overunity" or LENR plasma device that *seems* to have been legitimately operated in the negative resistance regime: and to produce a negative resistance a plasmoid with a double layer providing a source of ions MUST be present! I think the evidence is significant that these fireballs (less energy dense versions of Ken Shoulder's EVOs) are critical for the SK's operation.

The reason I'm thinking that some number of electron-positron pairs may be extracted from the vacuum is because these plasmoids can frequently provide sudden accelerations to ions as they exchange energy with the overall plasma in the tube. Sudden accelerations of charged particles can cohere the active vacuum and extract electron positron pairs. However, I do NOT think that it is likely the number of positron-electron pairs extracted is high enough to account for the majority of excess heat. Instead, I think the high density of electrons at the double layer may catalyze LENR reactions as ions are exchanged in and out of the plasmoid.

Again, I'd like to say that IF this is how the SK works, then we have an amazingly elegant system that would have massive room for improvement - especially in designing variations that thermalize less of the electric current (self sustaining oscillations) produced by the plasma ball.

2 ^ | v • Reply • Share ›



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Axil Axil ➔ Guest • 3 years ago • edited

You are mixing two things up. Frank went to the QX demo and saw the balls in the QX

plasma. The QX was only running at 20 watts. It was the SK that produced the big power output. No one that I know of has seen the SK in person.

2 ^ | v • Reply • Share ›



Avatar

This comment was deleted.



Frank Acland ECW Admin ➔

Guest • 3 years ago

frank, I wrote about it in this thread:
<https://e-catworld.com/2017...>

1 ^ | v • Reply • Share ›



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This comment was deleted.



Frank Acland ECW Admin ➔

Guest • 3 years ago

Remember, that I saw an early version of the QX, which was a new type of E-Cat, different from the one used in the Doral plant.

1 ^ | v • Reply • Share ›



Anon2012_2014 • 3 years ago

While plasma ball hot fusion model as proposed by FutureIsNow has a certain elegance, trying to build an entire science from Rossi simply saying one word "yes" to a guess on JONP is not science.

Rossi's answers on JONP is like going to a fortune teller where the client ask a question that they want to hear a yes answer to, and the fortune tell simply says "yes", perhaps with an appropriate amount of hand waiving.

^ | v • Reply • Share ›



Bob Greenyer ➔ Anon2012_2014 • 3 years ago

Yes

4 ^ | v • Reply • Share ›



Pekka Janhunen ➔ Anon2012_2014 • 3 years ago

'Yes'

3 ^ | v • Reply • Share ›



Gerard McEk • 3 years ago

It seems plasma's are the way to go for LENR: (Rossi, Saffire, BLP). The actual mechanism that produces the energy is still in the dark for them, but I believe Alexander

Parkhomov is guiding us here: It may be the very slow neutrino's that initiate LENR! See: <https://e-catworld.com/2019...>

1 ^ | v • Reply • Share ›



TheFutureIsNow ➔ Gerard McEk • 3 years ago

Although a few different mechanisms of cold fusion may exist, I think that Kenneth Shoulders EVOs (a macro-scale version of which exists in Rossi's SK) are perhaps a unifying theme. Even in Alexander Parkhomov's paper, he shows reactions in which electrons come together with hydrogen and other atoms to produce reactions. I suspect that these electrons are organizing with hydrogen atoms (on the smallest scale perhaps existing as one proton with a number of electrons in various geometric configurations) and screening the coulomb barrier.

2 ^ | v • Reply • Share ›



Bob Greenyer ➔ TheFutureIsNow
• 3 years ago

Yes.

Parkhomov is not concerning himself with the specific 'Active Agent', the black box in which the action happens. He is just working with what he knows, what has been observed and what is justifiable in the Main Stream.

EVOs are the key... Their life cycle, and ability to be controlled AFAIK, is WHY plasma is the best way and I will walk through that.

Specifically, I said what is needed to understand this in Sochi presentation, particularly in the Q&A. Any Boson can feed it... this is why (some) Bosons are now included in the Power Parkhomov calculator. But this will expand.

We're getting close - someone will guess soon, it should be obvious by now.

Regardless, I will spell out what I understand as soon as I can.

I have one blog on BL to publish first. Then I must do my personal taxes. Then I will get right to it. Step by step. I suggest reading the papers on the other thread

O Day is coming!

4 ^ | v • Reply • Share ›

**Axil Axil** • 3 years ago • edited

I don't beleive that the election/positron pair production is occurring in the SK. There are no gammas coming from the SK according to Rossi. Just photon pair production (infrared/UV) is coming from the SK.

2 ^ | v • Reply • Share ›

**Pekka Janhunen** ➔ Axil Axil • 3 years ago

Agreed.

2 ^ | v • Reply • Share ›

**Axil Axil** • 3 years ago

Any plasma will generate negative resistance, That why a florescent bulb uses a ballast.

<https://en.wikipedia.org/wi...>

A familiar and widely used example is the inductive ballast used in fluorescent lamps to limit the current through the tube, which would otherwise rise to a destructive level due to the negative differential resistance of the tube's voltage-current characteristic.

2 ^ | v • Reply • Share ›

**TheFutureIsNo** ➔ Axil Axil • 3 years ago

I came across an account perhaps a year or so ago about a man that had modified a fluorescent bulb in a way that allowed it to produce excess heat and electricity. I can no longer find the article.

1 ^ | v • Reply • Share ›

**Axil Axil** ➔ TheFutureIsNo • 3 years ago

<https://www.slideshare.net/...>

Lattice Energy LLC-Are LENRs Occurring in Compact Fluorescent Lights-March 7 2013

1 ^ | v • Reply • Share ›

**Axil Axil** • 3 years ago • edited

Regarding the generation of electrical power from the plasma in noble gases...

The Papp engine produced a large amounts of electrical power and little heat. But that tech is now open source if it can be designed away from using alpha emitters.

1 ^ | v • Reply • Share ›

1 ^ | v • Reply • Share ›



Axil Axil • 3 years ago • edited

The reference to double layers is key. Whenever there is a accumulation of free charge as in a double layer, a plasma mirror may form. This structure will produce an electromagnetic event horizon that will serve to extract photons from the vacuum via Hawking radiation. An entangled photons pair is produced by Hawking radiation with the positive energy partner having an energy level in the infrared, and the negative energy photon partner with negative frequency that resolves to an energy level in the ultraviolet.

<https://physicsworld.com/a/...>



see more

1 ^ | v • Reply • Share ›



TheFutureIsNow ➔ Axil Axil • 3 years ago

So if you had to guess, what percentage of energy produced by the QX is from LENR reactions and what percentage is extracted from the vacuum via Hawking radiation?

2 ^ | v • Reply • Share ›



Axil Axil ➔ TheFutureIsNow • 3 years ago

I would guess that most of the energy produced by the SK comes from the vacuum. There is not much transmutation going on if the lifetime of the SK is one year.

2 ^ | v • Reply • Share ›



Pekka Janhunen ➔ Axil Axil • 3 years ago

Incidentally, electrostatic double layers are also thought to exist in space plasma, some thousands of kilometres along Earth's magnetic field above so-called discrete auroral arcs.

Instead of photons, the Hawking radiation analogue might also consist of some other wave modes like plasmons. It might be easier to trap such modes than it is to trap photons. It is true that also light can be "stopped" inside material, by lowering its phase

velocity enough, but one can also consider other wavemodes for such purpose.

I think Rossi has been hinting at some "other" wavemodes that somehow annihilate and produce low-temperature heat... However, that said, I think if he would have a theory that he's himself satisfied with, he would have come to public with it.

2 ^ | v • Reply • Share ›



Axil Axil → Pekka Janhunen • 3 years ago

I beleive that LENR is based mostly on the polariton because negative mass(a sign of energy extraction from the vacuum) has been detected to arise from a polariton condensate. The electron can become entangled with the phonon, exciton and plasmon

<https://www.researchgate.net/publication/331111111>

On the theory of three types of polaritons (phonon, exciton and plasmon polaritons)

1 ^ | v • Reply • Share ›