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Further technical details about W-L gamma 'shielding' mechanism in condensed matter LENRs

More details will now be provided about the Widom-Larsen theory's concept of a built-in gamma 'shielding' mechanism that we believe occurs at LENR-active sites in condensed matter systems. What is referred to as 'shielding' in this context is really a process of absorption and direct conversion of locally emitted gammas into many more less energetic infrared photons (with a tiny, highly variable 'tail' in soft X-rays) at high efficiency while, of course, obeying the law of conservation of energy.

Importantly, ALL of the many-body particles found within a condensed matter 2 nm to 100 micron 3-D LENR-active 'patch' (in which there is also a total breakdown of the Born-Oppenheimer approximation) — surface plasmon or π electrons; protons or deuterons; produced ULM neutrons — oscillate collectively and — **key point** — are mutually quantum mechanically entangled with each other. This unique characteristic of LENR-active surface sites is explained in great detail in several Lattice SlideShare presentations; the existence of this Q-M phenomenon is well-supported by recently published, outstanding work by other researchers who operate totally outside the field of LENRs.

Because of the above, when an ULM neutron is created collectively, its 3-D DeBroglie wave function must perforce span all three spatial dimensions of the particular LENR-active patch in which it is 'born'. During a brief interval of several picoseconds before such a neutron is locally captured by some atom located with the (we think) oblate spheroidal spatial boundaries of the neutron's extended DeBroglie wave function within a many-body 'patch', it is interacting with MANY different atoms that 'compete' amongst each other to capture it (has a many-body scattering cross-section, NOT 2-body).

Note that only a modest percentage of the total number of mass-renormalized electrons located within the 3-D spatial Q-M domain of an LENR-active patch will have absorbed enough energy from the very high (> 2 x 10*11 V/m) local electric field to cross the threshold for making ULM neutrons by a direct e + p electroweak reaction. *Most of the heavier than normal electrons are locally present but unreacted*.

When an ULM neutron captures onto an atom located inside the entangled 3-D Q-M domain of an LENR-active patch, there is normally a prompt gamma photon emission by that atom. Well, remember that the DeBroglie wave functions of the entangled, mass-renormalized 'heavy' electrons are also 3-D, NOT 2-D. Since the neutron capture gamma photon emission occurs INSIDE the 3-D quantum mechanical structure of a 3-D LENR-active 'patch', there are always heavy electrons available nearby to absorb such gamma emissions and convert them directly into infrared photons. Ergo, it doesn't matter where a gamma emission occurs inside a given 3-D patch, it will always get converted to IR, which is exactly what has been observed experimentally. You will not see any fluxes of 'hard' gammas emerging from such a 3-D patch, no matter which x-y-z direction you try to measure them from.

The above 'shielding' also applies to any gammas that might be produced in conjunction with beta-decays of unstable, extremely neutron-rich isotopes that are briefly present in LENR-active patches before they 'die.' The vast majority of these very short-lived intermediate nuclear products will have disappeared in serial cascades of beta-decay chains into end-product stable isotopes/elements before the dynamic local population of heavy-mass electrons goes completely away. Again, this prediction is very consistent with what is seen experimentally: with mass spectroscopy, post-experiment you can observe the presence of stable transmutation products in which prompt capture gammas were undoubtedly produced along the likely nucleosynthetic pathway, but no 'hard' gamma fluxes can ever be measured during the process of LENR transmutation itself. Ergo, the gammas were converted to something else --- namely infrared (IR) photons that are manifested calorimetrically as 'excess heat'.

The oft-mentioned idea of taking an operating, current-technology LENR device and looking for measurable attenuation of a standard gamma photon source (e.g., Cobalt-60) passing through it would not work because present LENR devices have only a tiny fraction (<<<1%) of a device's surface that might be LENR-active at any given time. We have already spoken with people who are experts on low-count gamma measurements and they think that the signal-to-noise ratio in such a case would be too low for this to be a meaningful, direct experimental test of gamma suppression.

BTW - this typically minuscule % of LENR-active surface is exactly why measurable excess heat production in today's devices is usually very modest and only occurs rarely --- e.g., in 'successful' experiments it commonly amounts to just milliwatts to perhaps a Watt or so for a while before stopping. Recent claims by one company that is it has achieved reliable, long duration, consistently repeatable Megawatt heat production from an LENR thermal system are most likely delusional.

Substantially increasing the % and longevity of LENR-active surface area is one of several key technological hurdles that must be surmounted to successfully commercialize LENRs for power generation applications. We now believe Lattice has indeed finally developed key technical knowledge that is required to begin an LENR device engineering program aimed at building well-performing commercial prototypes with fully predictable, controllable heat output. In that regard, we are presently looking for the capital needed to fund that program. Obviously, we have no intention of releasing any of that extraordinarily valuable engineering-related information publicly in any venue.

It is also important to note that ULM neutrons are captured locally inside the spatial domain of an LENR-active patch long before they have enough time to thermalize, which takes 0.1 to 0.2 milliseconds. *This is exactly why significant energetic neutron emissions are so infrequent in LENR condensed matter systems.*

Lastly, Lattice also has a fundamental issued US patent on its gamma shielding art as follows:

US #7,893,414 B2 titled, "Apparatus and Method for Absorption of Incident Gamma Radiation and its Conversion to Outgoing Radiation at Less Penetrating, Lower Energies and Frequencies"

Inventors: Lewis Larsen and Allan Widom
Issued: February 22, 2011
Assignee: Lattice Energy LLC
Clean copy at: http://www.slideshare.net/lewisglarsen/us-patent-7893414-b2

Abstract:

"Gamma radiation (22) is shielded by producing a region of heavy electrons (4) and receiving incident gamma radiation in such region. The heavy electrons absorb energy from the gamma radiation and re-radiate it as photons (38, 40) at a lower energy and frequency. The heavy electrons may be produced in surface plasmon polaritons. Multiple regions (6) of collectively oscillating protons or deuterons with associated heavy electrons may be provided. Nanoparticles of a target material on a metallic surface capable of supporting surface plasmons may be provided. The region of heavy electrons is associated with that metallic surface. The method induces a breakdown in a Born-Oppenheimer approximation. Apparatus and method are described."

Lewis Larsen, President and CEO

