



Self-Organized Criticality & Avalanche Example

Mouse Trap Reactor

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Above we see a picture of a glass aquarium filled with ping-pong balls and set mouse traps. You can link to: http://www.youtube.com/watch?v=Pmy5fivl_4U to see the video in real time. This video is a teaching demonstration used in nuclear physics to show students what happens in a nuclear run away reaction when splitting U235 uranium. I direct your view to the upper right hand side of the video. There you will see a red ping-pong ball which represents a fast neutron. The white ping-pong balls on the base of the aquarium represent atoms of U235. Once the fast neutron hits one of these U235 atoms it releases its energy upsetting the natural balance of the U235 nuclear fuel. What takes place is a massive avalanche or a reaction that is uncontrolled until all the nuclear fuel is used up. By touching the bar on the bottom of the video with the mouse you can move the video forward or backward in time. Keep in mind that once a nuclear fuel has been used it no longer can produce energy unless it goes thru a refining process to collect any unspent fuel. This process also produces harmful nuclear waste materials as well as particles harmful to life and the waste products can be used to produce weapons of mass destruction.

So what does this video have to do with the “*Direct Energy Conversion*” method? It turns out that this very same video can be used to show what happens when a photon interacts with an electron inside of the thin film crystal lattice structure of a thin film superconductor when exposed to coherent photons.

In a small but wonderful book authored by Richard P. Feynman, Titled: “The Strange Theory of Light and Matter”, Quantum Electrodynamics, or QED. This book explains what happens when the right energy level photon is absorbed by a low energy electron. Type II superconductor material when in the superconducting state have electrons that have fallen into the lowest energy state. These electrons are in a low energy orbit. This low energy orbit allows for the material to exhibit the Meissner Effect or the loss of resistivity, the most common description of superconductivity. Superconductivity has a lot more to offer than just these attributes.

While in the superconductor state the material transforms from a ceramic material to a perfect diamagnetic material. This is very important since the DEC concept plans to use the superconductor state to perform a mechanical work function identical to that of a rotating armature. PEP is hoping to harness this change of state to do useful work.

I would highly recommend reading this short text to become familiar with QED principles'. In effect, Dr. Feynman predicted that if a given photon of the right energy packet and wavelength was injected into a material that any electron traveling in a low energy orbit would consume this photon energy and this infusion of energy would kick this electron back into a higher energy orbit, i.e., in this case the superconducting electron would then jump into a new higher energy orbit or the same orbit that the superconductor material would be at room temperature causing the superconductor to convert back to a normal material in this case a ceramic which does not have any magnetic properties of any kind.

So getting back to the video, we now replace the red ping-pong ball with a Photon of a given energy level and wavelength. The white ping-pong balls are now replaced with low energy electrons because they are in the superconductor state and all lined up in the crystal lattice structure. As stated before, when the energy of the photon is captured by a single electron it can no longer stay in the low energy orbit and it jumps to the next higher orbit, much like you see when the red ping-pong ball comes into contact with the white ping-pong balls. The photon dropped into the glass aquarium filled with ping-pong balls causes a fast avalanche with just a small amount of energy input.

One thing to note, in this example the white ping-pong balls are electrons that have self organized due to the thin film crystal lattice structure of the Type II superconductor material. As the high energy photons enter into the superconductor thin films they upset the low energy balance and cause a wave effect to ripple across the thin film causing all of the electrons to jump into a higher energy band gap forcing the material to be non-superconducting.

This work function is then used to cause modulation of the static flux much like the same effect of a rotating armature, only in this case without any moving parts with the exception of photons and electrons. Some very important aspects to remember, 1) when a superconducting material is at or below its T_c it becomes a superconductor, 2) due to the thin film layers of superconducting material the electrons are limited in x, y, z direction as well travel defined by the crystal lattice structure causing them to toggle in and out of the superconductor state with minimum photon energy input, 3) all of the electrons are self organized and fall naturally into their low energy state when cooled or give up a photon, 4) thin film superconductor material

will avalanche when the right energy level or wave length photon is introduced to the device which allows a state change and the extraction of useful work, and last, 5) one of the most important aspects of any device is that it will reset.

In this case once the high energy photons are removed from DEC the thin films will drop back and self organize allowing the material to become a superconductor once again allowing the process to be repeated. By touching the sliding indicator on the mouse trap reactor you can push it to the far left and reset the video.

This is the same thing as turning off the photon source stimulating the low energy electrons. Removing the photon source of energy allows the superconductor electrons to fall back into the superconductor state. By controlling the time and frequency of this change we now have the means to modulate static flux without a moving armature improving our conversion efficiency of electrical energy and without the production of any combustion gasses or the consumption of any hydro carbon fuels. This process also doesn't produce any nuclear waste of any kind and has the potential to produce massive amounts of clean electrical energy all without harming the planet.

The new method of producing clean CO2 free electricity will revolutionize that way man will generate his electricity in the future. This method is much more compact and economical then solar Photovoltaic's or wind power.