

Debunking Neutrino Detection Experiments

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Vector particle physics [1] provides the correct structures and characteristics for the electron type neutrinos, the muon type neutrinos, and the proton and neutron. These previously unknown particle structures give particle characteristics that clearly show the neutrino is not emitted from nuclear proton electron capture (EC) sequences. Detailed kinematics, showing the proton electron capture (N-1H) neutrino energy is absorbed in the daughter nucleus is proof that no neutrinos are present for neutrino detection in the experiments supposed to reveal neutrino characteristics. Examples of some well known neutrino experiments are discussed to show all are based on incorrect notions of the nuclear physics EC decay sequences.

1. Introduction

Hate them or love them, the neutrinos do exist. The new vector particle physics automatically gives the correct structures for the neutrinos. The photon's Poynting vectors allows deducing the correct structures for the electron, positron, electron type neutrino and muon type neutrino, by connecting the *E*, *H* and *S* photon vectors in all possible ways. (Fig. 1).

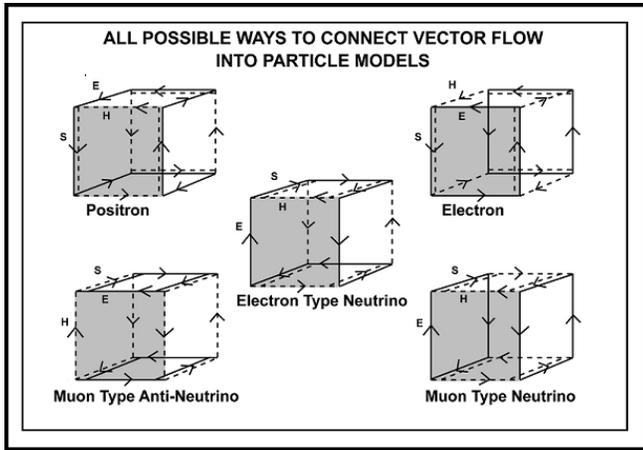


Fig. 1. Structures of all possible basic particles

When the (Fig 1) lepton structures were first obtained automatically I did not know what they represented. After much effort the particle types they mimicked were deduced to be those as now labeled. These structures turn out to be the only basic particles nature has (or needs). It is an experimental fact that all composite particles decay into just these basic particles, with the exception of the stable composite proton.

2. Ghostly Neutrinos

The neutrino was first proposed in 1930 by Wolfgang Pauli to explain an undetected small amount of missing energy, from the beta decay of the neutron. See Fig 2. The neutron minus the electron and proton (N-1H) missing energy was undetected by their calorimeters. They postulated the neutrino interacted weakly and traveled at the speed of light *c* with a zero rest mass, like the photon. They also assumed the neutrino had a spin angular momentum of $\hbar/2$, ignoring the fact that every other spin 1/2 particle in the universe, has charge, mass and magnetic moment!

$N = 9.39565330172219 \times 10^8 \text{ kg m}^2 \text{ s}^{-3} \text{ A}^{-1}$ $P = 9.38271998334513 \times 10^8 \text{ kg m}^2 \text{ s}^{-3} \text{ A}^{-1}$ $Me = 5.10998902748573 \times 10^5 \text{ kg m}^2 \text{ s}^{-3} \text{ A}^{-1}$
(N-1H) = Neutrino (ν)
$N - Me - P = 7.82332934957862 \times 10^5 \text{ kg m}^2 \text{ s}^{-3} \text{ A}^{-1}$
The missing energy is 0.7823329 MeV that did not appear in their calorimeters. ***** This missing energy was postulated to be the neutrino, and was assigned the characteristics of spin and zero mass. (however) Spin angular momentum requires a mass rotating with a velocity (<i>c</i>) at a radius arm.

Fig. 2. The (N-1H) 0.78233 MeV missing mass energy, is the neutrino, from the beta decay of the neutron.

3. Proton and Neutron Structure

Vector Particle Physics proves the proton is a stable combination of the positron and electron type neutrinos, the anti-proton is a stable combination of electron and electron type neutrinos.

Fig. 3 shows the only possible, and what will be shown to be, absolutely correct proton and neutron structures. The scaled proton mass ratio M_p , of the vector proton prediction is 1836.147 electron masses, which is within 3 parts per million of the CODATA recommended proton value.

In the mid 1970's, when this proton scaling was first calculated, I did not have a computer so used a hand held calculator accurate to ten places. The resulting spread sheet took six hours to complete.

The spread sheet's first two scaled layers of the proton had exactly the difference in mass ratio, known to exist between the proton and neutron (Fig. 2) by beta decay. By adding the neutron's known decay electron and electron type neutrino, when it changes into a proton, to the first two scaled layers of the proton model, gave the neutron model a mass ratio of 1838.68439 which is within about 400 parts per billion of the CODATA.

This changing of the proton into a neutron is exactly what happens in the capture of orbital electrons by the nuclear proton

EC known since 1938. Further, this vector particle result also justifies use of the neutrinos, and their scaling, for the vector proton's and vector neutron's structures.

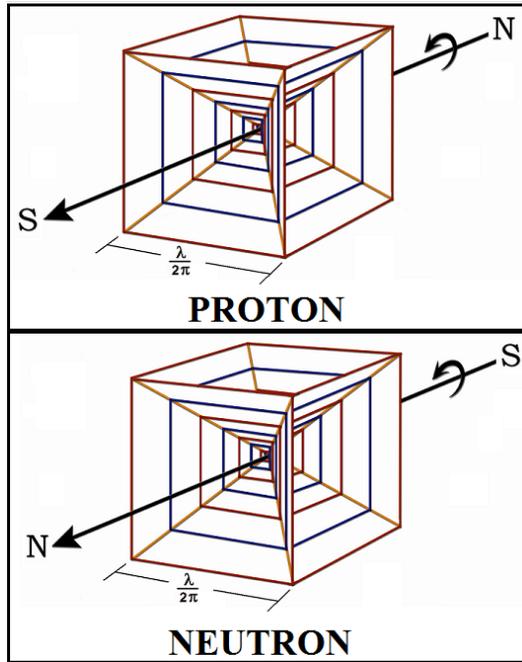


Fig. 3. Vector proton and neutron structures

4. Neutrino Theory Review

In 1938 Alvarez [2] paper "The Capture of Orbital Electrons by Nuclei" presented a simple theory for electron capture (EC) by a nuclear proton, changing it into a neutron. Alvarez mistakenly showed a neutrino ν was emitted per $e^- + P = N + \nu$ when the neutron was formed.

In 1935, Yukawa et, al [3] suggested positron emitters might decay by the alternate process of EC but, like Alvarez, mistakenly thought the positron emitters released a neutrino per $P = N + e^+ + \dots + \nu$.

Fig. 4 [4] shows that there was incomplete knowledge about the neutron and proton structure, so Alvarez should not be faulted for his wrong equation. Unfortunately the standard model today does not give correct details about proton and neutron structures, only the Vector Particle Physics is correct.

Ref. W.Lemkin, "Visualized CHEMISTRY" Oxford Book Co. (1938)

APPENDIX 315

- **Neutron.**—An electrically neutral particle of unit mass, made up of a proton and an electron that are closely united to each other.
- Non-electrolyte.**—A compound whose water solution does not conduct the electric current. *Examples:* glycerine, sugar.
- Non-metal.**—An element which is a borrower of electrons, forms acids, does not have the characteristic metallic luster, and does not easily conduct electricity. *Examples:* chlorine, sulphur, nitrogen.
- Normal salt.**—A salt formed by the complete neutralization of an acid and a base, and which therefore does not contain replaceable hydrogen or hydroxyl groups. *Example:* Na_2PO_4 .
- **Nucleus.**—The positively charged core or central portion of an atom, made up of electrons and protons, the latter always being in excess.

Fig. 4. In 1938, we see that the neutron was thought to be a proton closely united with an electron. They had no concept that the neutrino was also a part of the neutron.

Fig. 5 reviews the vector physics derived neutrino structures.

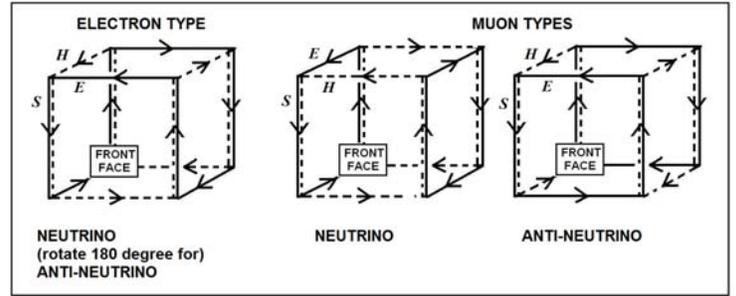


Fig. 5. These neutrino structures were given to us automatically by combining the photon in all possible ways. We see the free neutrino does not spin or move. It is found in the proton and neutron that the neutrino acquires spin mass and charge in concert with the positron or electron.

It would have been impossible for me to simply invent these neutrino structures, they have been given automatically, by simply connecting the photon (energy) vectors in all possible ways.

The muon type neutrinos were found to form the negative muon, when combined with the electrons vectors, and the positive muon when combined with the positrons vectors. There are no mixed doublets of electron and muon neutrinos from the muon decay, as was previously supposed by Lederman (1962).

The electron type neutrino is associated only with the proton and neutron structures. The electron type neutrino combines with an electron or positron thus acquiring spin, mass, charge and magnetic moment, forming the mass and magnetic moment of the proton and neutron.

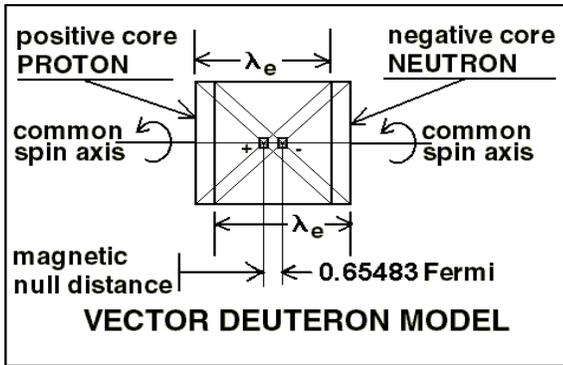
$$\begin{aligned}
 N &:= 1..18 & E_m &:= \left[1 + \left(\frac{\alpha}{d} \right) \right] & \text{Mass ratio including electrical pot energy} \\
 S_N &:= \left[(0.5 \cdot \sqrt{2})^N \cdot (1 - \sqrt{2} \cdot \alpha_u) \right]^{-1} & & & \text{Scaling factor for nested cubes} \\
 M_p &:= E_m + \sum_N E_m \cdot S_N & M_p &= 1.83614676824396 \times 10^3 & \\
 & & & \text{CODATA=1836.152701} & \\
 M_n &:= 2 \cdot E_m + 2 \cdot E_m \cdot \left[(0.5 \cdot \sqrt{2}) \cdot (1 - \sqrt{2} \cdot \alpha_u) \right]^{-1} + \sum_N E_m \cdot S_N \\
 M_n &= 1.8386843966164 \times 10^3 & & \text{CODATA=1838.683662} &
 \end{aligned}$$

$$\begin{aligned}
 \mu_e &= 9.28476377 \times 10^{-24} \text{ m}^2\text{A} & \text{electron mag mom} \\
 \alpha_u &= 1.15927837559 \times 10^{-3} & \text{geometric correction} \\
 \mu_{pm} &:= \mu_e \cdot \left[\left(\frac{\sqrt{2}}{2} \right)^{18} \cdot (1 - \sqrt{2} \alpha_u) \right] \\
 \mu_{pm} &= 1.81045736412638 \times 10^{-26} \text{ m}^2\text{A} & \text{proton mag} \\
 \mu_p &= 1.410606662 \times 10^{-26} \text{ m}^2\text{A} & \text{proton nmr mag mom} \\
 \mu_n &= 9.6623641 \times 10^{-27} \text{ m}^2\text{A} & \text{neutron nmr mag mom} \\
 \mu_{nm} &:= \mu_n + (\mu_{pm} - \mu_p) \\
 \mu_{nm} &= 1.36608711212638 \times 10^{-26} \text{ m}^2\text{A} & \text{neutron mag}
 \end{aligned}$$

Fig. 6. Mathematical proof that the vector particle physics proton and neutron give the correct proton and neutron mass ratios. The lower block shows the calculations for the NEW nucleon undamped magnetic moments.

Fig. 6 gives mathematical proof of the composite particle structures. The model also predicts new and previously unknown undamped magnetic moments for the proton and neutron. A model which predicts known characteristics, is always possible, but the deriving of unknown characteristics, and then finding independent verification, is indisputable proof of concepts. These new undamped magnetic moments made possible the direct calculations of the binding energy between a proton and neutron, giving me independent proof for the predicted undamped magnetic moments. The new value for the proton and neutron magnetic moments allowed me in 1998 to be able to directly calculate the nucleon binding energy using just nucleon charges and magnetic moments. It turns out that the near field magnetic moment forces are superior to the enormous near field electrostatic forces between nucleons, making the strong force electromagnetic.

The strong force has been demonstrated in the Fig. 7 equation for the binding energy between the proton and neutron in the deuteron. The binding energy equation is derived by setting the electrical potential energy and magnetic potential energy (in electron volts) equal to null and then algebraically solving for the binding energy (B_{epn}).



$$B_{epn} = \left[\frac{e^2}{\sqrt{64\pi^2 \cdot \epsilon_0^3 \cdot \mu_0 \cdot (\mu_{PM} \cdot \mu_{NM})}} \right]$$

$$B_{epn} = 2.1989708535 \cdot 10^6 \cdot \text{kg} \cdot \text{m}^2 \cdot \text{s}^{-3} \cdot \text{A}^{-1}$$

$$\text{NIST} = 2.224573 \cdot 10^6 \text{ eV}$$

Fig. 7. Deuteron model structure for the vector particle physics and calculation of the binding energy between the proton and neutron are shown. The resulting mass defect binding energy agrees with the empirically measured NIST value. This result gives the independent proof that the model predicted undamped magnetic moments are correct. This also serves to prove the structure for the vector proton and neutron as being composed of the electrons, positrons and electron type neutrinos.

5. Neutrino Detection Follies

The neutrino detection experiments based on EC and β^+ decay sequences, have no free neutrinos to detect. In EC or β^+ decay, the neutrino energy (N-1H) is always absorbed in the daughter's nucleus.

The neutrino experimenters used some very ingenious methods, but unfortunately are all based on mistaken understanding of EC processes.

It is now my task to show why the selected neutrino experiments failed to prove their claimed results.

6. 1952 Rodeback and Allen

The experiment of Rodeback and Allen [5] was an ingenious setup to try to indicate a neutrino, when Argon 37 decays into the daughter Chlorine 37 by EC.

An analysis of the process shows they measured the recoil of the photon from the EC no free neutrino exists. We know now that EC neutrino (N-1H) energy of 0.78233 MeV is absorbed in the daughter. A neutrino being emitted by EC in those days, was mistakenly assumed by every theorist.

**37 Ar (EC) 37 Cl recoil calculations from conversion photon
NO NEUTRINO**

$\mu_{ev} := 931.494028 \cdot 10^6 \cdot \text{kg} \cdot \text{m}^2 \cdot \text{s}^{-3} \cdot \text{A}^{-1} \cdot \mu$ atomic mass eV

$\text{CL37} := 36.965902636578 \cdot \mu$ $\text{AR37} := 36.966775964511 \cdot \mu$

$\text{BECL37} := 317.100455 \cdot 10^6 \cdot \text{kg} \cdot \text{m}^2 \cdot \text{s}^{-3} \cdot \text{A}^{-1}$

$\text{BEAR37} := 315.504616 \cdot 10^6 \cdot \text{kg} \cdot \text{m}^2 \cdot \text{s}^{-3} \cdot \text{A}^{-1}$

$\text{NEW} := \text{BECL37} - \text{BEAR37}$

$\text{NEW} = 1.595839 \times 10^6 \text{ kg m}^2 \text{ s}^{-3} \text{ A}^{-1}$ Total new energy
created in (EC)

$Q := (\text{AR37} - \text{CL37}) \cdot \mu_{ev}$

$Q = 8.13499754075282 \times 10^5 \text{ kg m}^2 \text{ s}^{-3} \text{ A}^{-1}$ energy that
is emitted

$\text{NEUTRINO} := \text{NEW} - Q$ (n-1H) neutrino energy absorbed in
daughter CL37 atom not emitted

$\text{NEUTRINO} = 7.82339245924718 \times 10^5 \text{ kg m}^2 \text{ s}^{-3} \text{ A}^{-1}$

$\text{KECL37} := \frac{(Q)^2}{2 \cdot (\text{CL37} \cdot \mu_{ev})}$ Photon recoil energy in
electron volts

$\text{KECL37} = 9.60955918900989 \text{ kg m}^2 \text{ s}^{-3} \text{ A}^{-1}$

Note; Rodeback & Allen (1952 Phys. Rev. Vol 86 p.446)
Measured the recoil as (9.7 +0.8 eV) and claimed the test
was a neutrino. We now know no neutrino from (B+) or (EC).

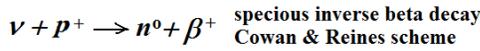
Fig. 8. Mathematical proof that the proposed neutrino source of Ar37 EC Cl37 does not emit the 7.8233 MeV neutrino energy. The binding energy mass defect photon recoil is measured.

The Fig. 8 equations give the correct kinematics for the Ar37 EC Cl37 decay that proves that Rodeback and Allen measured recoil is from the EC emitted photon, not neutrino recoil. In Fig. 8 we first derive the binding energy mass defect of BECL37 and BEAR37 to obtain the difference as the NEW energy created in the reaction. The Q is the measured portion of the NEW mass energy that is emitted. We see that emitted Q portion of the NEW energy is the NEUTRINO energy that has been absorbed in the daughter CL37 mass energy.

Thus Rodeback and Allen measured the Q energy photon recoil we calculated as KECL37. Obviously, no neutrino recoil was indicated, the neutrino energy (N-1H) was absorbed in the daughter.

7. First Claim for Detecting

In 1956, Cowan and Reines [6] claimed to have discovered the electron anti-neutrino using the Savanna River nuclear reactor. The Savanna River Reactor experiment was the first big science project after WWII. Cowan and Reines proposed that neutrinos could be detected in a (never before demonstrated) "neutrino induced" inverse beta decay.



This specious inverse beta decay scheme was based on an incomplete knowledge of the internal proton and the neutron structures. Now the Vector particle physics structures show that inverse proton beta decay cannot occur. Inverse beta decay neutron formation has been detected by a nuclear proton absorbing an electron, but never caused by a neutrino. The false positives they saw from e^+, e^- annihilation in their detectors was from Cosmic Rays that they did not properly veto.

When Cowan and Reines first claimed their detection of the neutrino, they were reminded that Cosmic rays could cause false positives thus making a very dirty experiment. To answer this critique, they operated their experiment with the reactor 'off' for 24 hours and then 24 hours 'on'. It was claimed they saw 70 fewer events with the reactor off out of the hundreds with the reactor on during the same period. But we know, of course, that all detected events are false, as inverse beta decay by neutrinos is not possible. The positrons detected can only have come from Cosmic rays.

8. Left Handed Neutrino Spin?

In 1957, Goldhaber, Grodzins and Sunyar [7] claimed to have indicated the neutrino spin by measuring the spin of the photon from EC of Europium 152 to daughter Samarium 152. The theory was the neutrino is emitted in one direction, and the Samarium recoils in the other direction. But we know EC emits a photon not a neutrino.

The Samarium 152 first created in EC is really in an isomeric state that quickly de-excites by emitting a 960 keV photon as the nucleons rearrange into a stable Sm152.

Goldhaber et.al. [7] measured the photon spin characteristics and claimed that this indicated the neutrino was left handed. We know this a false conclusion, because no neutrinos are emitted from EC.

Proton-Proton Solar Cycle	
FALSE	CORRECT
$p + p \rightarrow D2 + \beta^+ + \nu$	$p + p + e \rightarrow D2$
$He3 \rightarrow He4 + \beta^+ + \nu$	$He3 + p + e \rightarrow He4$
$Be7 + e \rightarrow Li7 + \nu$	$Be7 + e \rightarrow Li7$
$B8 \rightarrow Be8 + \beta^+ + \nu$	$B8 + e \rightarrow Be8i \rightarrow Be8$
$N13 \rightarrow C13 + \beta^+ + \nu$	$N13 + e \rightarrow C13$
$O15 \rightarrow N15 + \beta^+ + \nu$	$O15 + e \rightarrow N15$
In Electron Capture (EC) the neutrino (ν)energy is absorbed in the daughter, not emitted!!!	

Fig. 9. The proton-proton solar cycle is entirely the EC decay sequences that are shown with the false notion that the electron capture produces the neutrino. The right column gives the correct equations for EC.

9. Neutrinos from the Sun?

The postulated neutrinos from the sun are all supposed to come from EC decays. In Fig. 9 the proton-proton cycle is debunked as a source for neutrinos ν . Here the left side column

shows the published Proton-Proton Cycle that was thought to produce a large flux of neutrinos from the sun. Notice the proton-proton Solar Cycle theory was based entirely on electron capture (EC) reactions as the source of free neutrinos ν .

We now know that the electron capture (EC) decay does not produce a free neutrino. The right column gives the correct electron capture equations.

As we have seen, all bench experiments for determining neutrino characteristics all relied on the false notion that electron capture decay sequences produce free neutrinos. And now, all neutrino detection schemes used in subterranean vaults, for the detection of neutrinos from the sun have absolutely no neutrinos to detect.

10. Attempts to Detect Solar ν

In 1964, John Bahcall and Ray Davis [8] discussed the possibility of detecting solar neutrinos. Bahcall calculated a theoretical neutrino flux from the sun for Davis, based on the false premise that EC from Boron 8 decay to Beryllium 8 would produce high energy neutrinos.

Davis obtained funding and installed a 100,000 gallon tank of C2CL4 (cleaning fluid) in the Homestake Gold Mine in South Dakota.

The EC inverse beta decay of Chlorine 37, induced by neutrinos, was mistakenly supposed to create radioactive Ar37 (t=50.6 days).

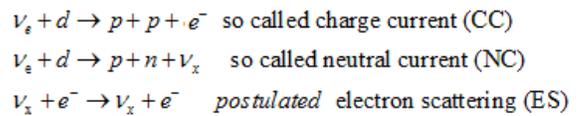
The Chlorine 37 decay, with the proposed solar flux, was to produce about 5 atoms of Ar37 per day, but Davis [8] claimed to see only one event every 3 days. No significant increase over background.

This lack of neutrino signals became known as the 'Solar Neutrino Problem', but we now know that the solar cycle EC decay cannot produce free neutrinos from the sun.

11. Recent Neutrino Efforts

Recently experiments [9] at Sudbury Neutrino Observatory (SNO) have also claimed (less) detection 'Solar Neutrino Problems'.

The SNO mistakenly believed that B8 EC Be8 creates high energy neutrinos detectable by these proposed reactions.



These three supposed detection schemes are all mistaken physics. Even if neutrinos were streaming from the sun, the charged current (CC) and neutral current (NC) are based on false ideas about proton and neutron structures.

First, (CC) falsely supposes that (d deuterium from the heavy water in the detector can change one of the d neutrons into a proton and an electron e^- by a solar neutrino striking the neutron.

The (NC) falsely supposes a neutrino can split a d into a proton, neutron and a neutrino.

The (ES) falsely supposes that neutrinos can scatter electrons and be detected by Cerenkov radiation.

It is not possible for the nonexistent EC solar neutrinos to cause the deuterium proton and neutron to separate, or to scatter electrons. Cosmic Ray muon decays can give all of the false positives claimed.

12. No Neutrinos, B8 EC Be8

It will now be useful to provide the detailed atomic structure and binding energy physics that clearly shows no neutrinos are produced from Boron 8 EC to Beryllium 8. (Fig. 10).

Fig. 9 shows this author's models for unstable Boron 8 that decays into the isomeric state of Beryllium 8 by EC. The nucleons are shown burst apart, but in truth are merged as in Fig. 7.

I find that the binding energy, in nuclei, is saturated, that is the nucleons only bind to two or three adjacent nucleons. This fact greatly simplifies the modeling of nucleons in nuclei, as there are repeating patterns common to all nuclei. [1]

The Boron 8 proton #7 captures an electron and (N-1H) neutrino energy to form the daughter Be8i. The Be8i nucleons #7 and #8 then spin flip to form the lower energy state of the Beryllium 8 (not shown) The Be8 then decays into two helium nuclei.

In (Fig. 10) the bottom equations show no neutrinos are emitted from EC. The new binding energy, created in the B8 EC Be8i, decay, is 11.0921635 MeV. But notice only a Q of -10.309838 MeV is emitted. The missing energy is the (N-1H) neutrino energy of 0.78233 MeV that shows as being absorbed in the daughter Be8i atom mass energy.

This Boron 8 EC on the sun was the great hope of neutrino hunters since Bahcall had promoted it as a source of high energy neutrinos.

As we see there is no neutrino from B8 EC Be8i decay.

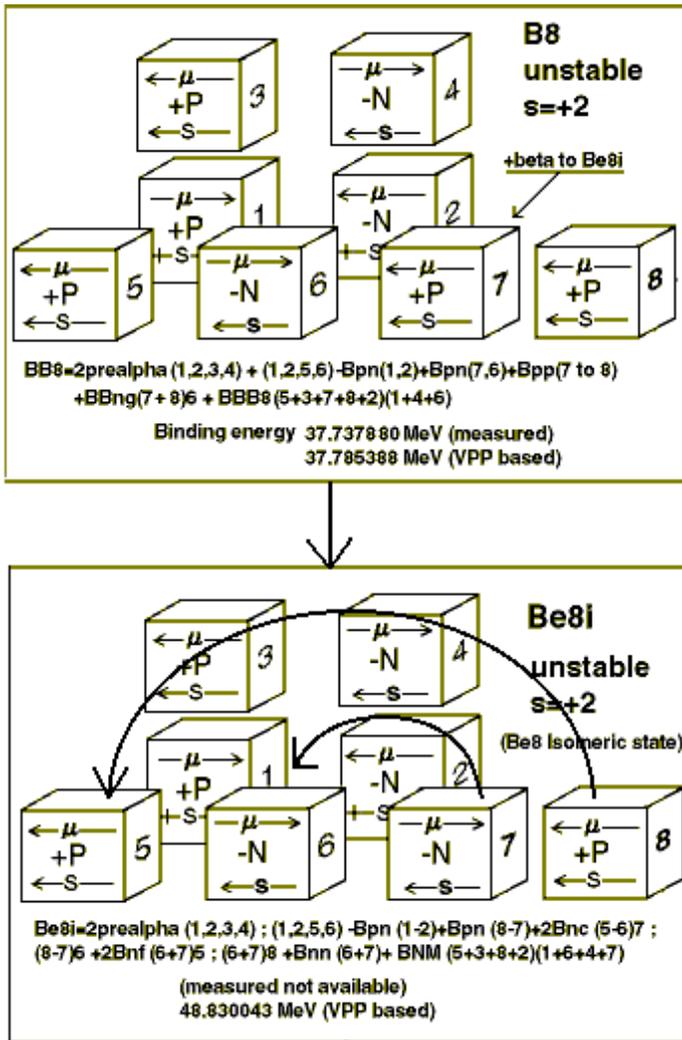
Conclusions

Since development of the new Vector Particle Physics in the 1970's I have known the structures for the photon, the electron, the positron, the electron type neutrino and the muon type neutrino.

With these basic particles it was then possible to deduce the correct composite structures for the muon, proton and neutron. The proton and neutron structures show that the neutrino energy is absorbed in the neutron at electron capture by the proton. The K shell electron capture changing a nuclear proton into a neutron requires the (N-1H) neutrino energy to be absorbed in the daughter, not emitted. Thus all claims to have detected the neutrino in EC from radioactivity sources on earth or from Solar Cycles are false.

References

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- [2] Luis W. Alvarez, "The Capture of Orbital Electrons by Nuclei", *Phys. Rev.* **54**:486 (1938).
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NO NEUTRINOS FROM BORON 8 DECAY INTO THE ISOMERIC STATE OF Be8

Binding energy Be8i = 48.8300435 MeV daughter

Binding energy B8 = 37.7378800 MeV parent

New binding energy +11.0921635 MeV gain

Q - (B8μ - Be8iμ)μν = -10.3098306 MeV loss

Neutrino capture (n-1H) = +0.7823329 MeV gain

Note: (n-1H) is the energy gained by the daughter in addition to the captured electron to make a normal neutron from a proton.

Fig. 10. The new atomic binding energy created in the EC of Boron 8 to the isomeric state of Beryllium 8i showing that the neutrino energy is absorbed not emitted.