Kha - a Unified Field Theory

by Finn Rasmussen

Abstract

The Kha field is found everywhere in the universe with varied energy density. Kha is composed of fields that penetrate each other and move in all directions at the speed of light. Kha is mainly composed of neutrinos and “spinners”. A neutrino is a helical part of the Kha. A spinner is composed of a light quark and a light anti-quark. Kha implies a fundamentally new theory of kinetic energy and relativity. Kha has an attractive force similar to black body radiation. Forces on particles are a result of the particles’ contact with Kha. This idea is verified for nuclear forces, inter-atomic forces, gravity and electrical forces. The contact between the neutron and the Kha gives quite a new explanation of beta decay.

The Kha field

Many physicists believe that all fundamental forces are, in fact, manifestations of a single unifying force, a unified field theory. Here, I will demonstrate that the Kha field is the origin of all forces. The Kha field is limitless and eternal. The Kha is composed of fields that penetrate each other and move in all directions at the speed of light, *c*. Positive and negative particles have been created by these fields at some point, so there must be a positive field and a negative field. (Rasmussen, 2019). There is no neutral field, but the field itself is normally neutral, as the positive and negative fields are present at the same density. The constant movement of the Kha field cause the energy density to be continuous in space. The Kha field tends to be in equilibrium, meaning that the energy density is constant in time everywhere.

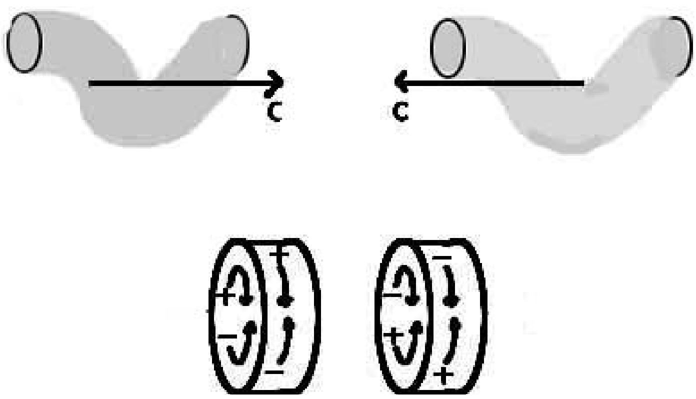

Figure 1

Sometimes two neutral parts of the Kha field, having the same energy the same volume and moving in opposite directions, will overlap and make a compound. A transformation takes place following Ampere's law: two electric currents in the same direction attract each other and two electric currents in the opposite direction repel each other. When the positive and the negative field move in opposite directions they have to rotate in a disc called a "spinner". On Figure 1 the spinner is formed as a puck, but we do not know the form. Two fields in a spinner have opposite charge and opposite spin and they completely combine. The energy density has to be the same inside and outside the spinner because of equilibrium. Hence some random neutral field must be present in addition to the rotating fields of the spinner. A spinner may be conceived as a pair of a quark and an anti-quark, but normal quarks in particles have much more energy and no additional field. Normal quark-pairs are observed in exited nuclei where they are also called partons. Normal quark-pairs are observed outside nuclei in neutral pions.

The formation of the spinner can not start simultaneously in all its parts. When a positive field in one place begins to rotate in one direction, the same amount of positive field must rotate in the opposite direction because the total momentum of the positive field is zero. Two spinners must be formed having opposite directions of electric current, Figure 1. The two spinners will repel each other magnetically according to Ampere's law. The magnetic force has a short range and the two spinners will possibly not move far away from each other.

In the case of Figure 1 the two incoming parts of Kha have the same energy and opposite momentum. If they have different energy, a pair of spinners may be formed, but in the compound there will be a surplus of field with momentum from one of the incoming parts. The momentum is shared, possibly in equal parts by the two spinners now having kinetic energy. When the incoming parts do not have opposite velocities, a similar result will be the outcome. A pair of spinners may erase, but the total momentum is not zero and the two spinners will share this momentum and have kinetic energy.

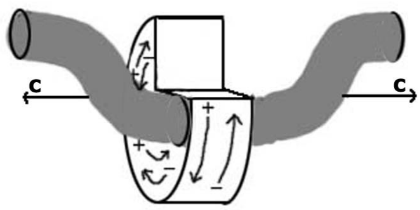

Figure 2

The process in figure 1 can go backwards and produce neutral parts of Kha. The it may happen that two spinners with opposite direction of current clash. The fields will create a neutral compound and create two neutral parts of Kha moving in opposite directions as in Figure 2. If the two spinners have the same momentum but in opposite directions, all the energies of the spinners will be used for the neutral parts. If the total momentum is not zero, there will be one or two spinners with momentum left. Each of the two original spinners must have an additional random field, which will be partly removed by the other spinner. The energy density of the compound including some additional random field will be equal to the energy density of the Kha field. The energy density of a spinner can not exceed the energy density of the Kha field. Furthermore the spinners with the maximum energy do not undergo the process figure 2 and they have a long lifetime.

The creation of the neutral parts have to begin in one place of the spinner and then continue with velocity *c* all the way round. We see a situation when ¼ of the neutral parts have left the spinner. The neutral parts will have the form of a helix. The width is the same as the diameter of the spinner. The length is the same as the circumference of the spinner or π times the width. The volume of one part is the same as the volume of the spinner.

The helical neutral parts are neutrinos. They are created from spinners and have less energy than the neutrinos created from normal quarks. Neutrinos are moving with speed *c,* and cannot remain at rest, and therefore have no resting mass. A neutrino has a right turn, when you look in the direction of the movement. An anti-neutrino has a left turn.

Kinetic energy

Particles have the same energy density as that of the Kha field in the early universe when they were created, (Rasmussen, 2019). Particles are composed of normal quarks with opposite charge and opposite spin. They have no additional field. We will look at a particle with rest energy mc^2 moving with velocity *v* through the Kha field. The particle encounters no opposition. The neutral random field in front of the particle becomes consumed. The positive part of the random field follows the negative part of the particles field, (Ampere's law), and vice versa. The particle leaves behind it a corresponding neutral field with random velocities.

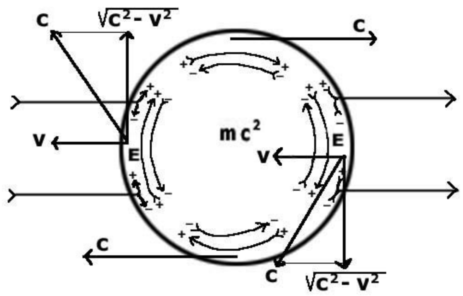

Figure 3

In Figure 3 some lines illustrate the stream of the neutral field outside -and the charged fields inside the particle. The streamlines show the stream in relation to the particle. The current velocities of the positive fields in relation to the Kha field are drawn as vectors. The field in the front part and the back part of the particle will have an increase *E* in energy content*.* These parts of the particle have a velocity component *v* in the forward direction*.* The other component of the velocity is directed along the surface of the particle. The two components added as vectors gives the field velocity *c.* From the triangle on Figure 3 we find the current velocity component of the positive field along the surface of the particle

$$\sqrt{c^2 - v^2}$$

The current velocity at the side parts of the particle is *c*. The energy density in the side parts is mc^2 / volume. The energy density in the front part and the back part is mc^2+E / volume. A side area has the same volume as the front part. Since energy density multiplied by current velocity is constant for a laminar flow, we obtain

$$(mc^2+E)*\sqrt{c^2-v^2}=mc^2*c$$

$$E=mc^2*\left(\frac{1}{\sqrt{c^2-v^2}}-1\right)$$

This is the relativistic formula for a particle's kinetic energy. When velocity *v* is much less than *c*, the formula becomes the classical formula for kinetic energy.

$$E=\frac{1}{2}mv^2$$

In general, kinetic energy may only be described in this manner. In the Kha theory kinetic energy is the energy of some extra Kha field in the moving object. But the extra Kha field is replaced all the time with some Kha field from outside the object. Kha also involves a fundamentally new theory of relativity, in which the velocity of a moving field is always *c* in relation to the local field, (Rasmussen, 2019). According to Kha, there would not be any velocities above c in figure 3 because the local fields in the side parts have a velocity backwards that neutralizes the particles velocity forwards.

Now we shall study a collision of two particles. Particles are made of spinning quarks. Let us take two atoms in a black body. A black body absorbs all radiation. When two particles clash, the kinetic fields in their front parts will make a compound. The positive and negative fields from one particle move in opposite directions. In the compound the two positive fields will meet, but they will never move in the the same direction. Depending on the circumstances there will be a spot of positive field with zero momentum and correspondingly at the same time another spot of negative field. The positive spot give raise to two opposite positive helices leaving the compound with velocity c, and the negative spot to two opposite negative helices. The formation of the helix has to begin in one place of the particle and then continue with velocity c all the way around the particle.

With his famous equations of 1864, the Scottish physicist, James Maxwell showed that light is comprised of electromagnetic waves. He believed that the electromagnetic fields were produced by electric charges in a light-bearing ether. Modern research does not acknowledge the existence of an ether, but I share Maxwell's view, and I call this light-bearing ether the Kha field.

According to the Kha theory, a photon is composed of a helix with a positive charge and a helix with a negative charge The two helices move together and can be right-screwed or left-screwed. Between the positive and negative helices, there is an electrical and magnetic field in agreement with Maxwell’s equations. The helix of a photon has only one turn. The length of the helix is called the wavelength and is π times its breadth. The photon penetrates the rest of the Kha field, that might include neutrinos and other photons moving in other directions. A photon has no influence on the Kha field and only interacts with spinners or particles.

The atoms in the black body have all kinds of kinetic energies and will create double helices, photons with all kinds of energies. The photons will at some point be absorbed by other atoms and be transformed into kinetic energy.

Energy density

We have seen that the Kha field is composed of spinners and neutrinos. Spinners can have kinetic energies like particles. However the spinners have an additional neutral random field. That means that spinners can penetrate each other and normally do not create photons. Instead they can make neutrinos with all kinds of energies by a process like figure 2.

A black body absorbs all incoming radiation. The atoms in a black body emits and absorbs photons. The photons have an energy distribution described by Planck’s law. The energy density of the black body radiation is determined by the temperature of the body. The radiation that leaves the surface of the body and the radiation inside the body have the same energy density. Black body radiation can be observed from a hole in an oven or from an incandescent lamp.

When we examine the Kha field, we may use the properties of the black body radiation because of the similarities. Black-body radiation with photons in equilibrium has very simple relations between pressure, *p* (Newtons/m^2); energy density, *e* (Joules/m^3) and emission power, flux, *f* (Joules/sec/m^2).

$$f = {}^{c}/_{4} * e \quad , \quad p = {}^{1}/_{3} * e \qquad (1)$$

Formula (1) is also valid for the Kha field in general. It is important that the force is attractive and the pressure is negative. In fact, light pressure is attractive when the light is reflected from particles. Several experiments have proved this (Sonnleitner, 2013) and it can be demonstrated very easily with Crooke's radiometer. The attractive force of the Kha indicates that gravity is an attractive force.

Now, we have to examine the Kha field round a particle. The energy density is higher in the particle than outside the particle. Particles are composed of quarks. Two quarks with opposite charge and opposite spin mix and hold together according to Ampere’s law. A particle can keep a high energy density because it has rotation, or spin. We may say that magnetic forces keep the particles intact.

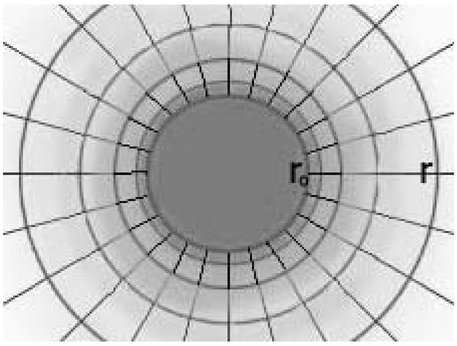

Figure 4

Let us consider a spherical particle with radius r_0 and energy density e_0 at the surface. The particle could be anything from a neutron to a massive body. The Kha field has rotational symmetry because there are no other particles in the neighbourhood to disturb. We now consider an outer sphere with radius *r* and energy density *e*. The Kha field between the two spheres is pulled inwards by the particle sphere. We can calculate the total inwards force by multiplying the pressure from formula (1) with the surface area of the particle sphere.

$$^1/_3 * e_0 * 4\pi r_0^2$$

The Kha field is pulled outwards by the outer sphere and we can calculate the total outwards force in a similar way. The two forces must be equal because of equilibrium. So

$$^1/_3 * e_0 * 4\pi r_0^2 \quad = \quad ^1/_3 * e * 4\pi r^2$$

$$e = e_0 * r_0^2 / r^2 \qquad (2)$$

We will now name the Kha field in (2) “the gravitational Kha field from the particle”. Equation (2) is also valid for the traditional gravitational field strength, called *g,* but *g* is completely different from the energy density, *e*. The straight lines on Figure 1 are called field lines. They indicate the direction in which the energy density is falling. Circles are drawn through points with the same energy density. The energy density is the greatest where the field lines or the circles are most closely spaced.

From the neutron mass, *m*, we can calculate its energy mc^2. We have an approximate value of the neutron radius *r* , allowing us to calculate the volume and the average energy density. However, the energy density at the surface of the neutron might be smaller than that. We do not know how the energy is distributed in the neutron, but a negative magnetic moment indicates that one negative quark is placed in the outer part of the neutron. The energy density is least in the outer part; I suggest, half the average. Thus, we obtain the energy density at the surface of the neutron

$$n = ½ * \frac{mc^2}{4/3 * \pi * r^3} = ½ * \frac{1.7 * 10^{-27} * 9 * 10^{16}}{4/3 * \pi * (10^{-15})^3} = 1.8 * 10^{34}$$

Forces

The common understanding is that forces operate over long distances. However, I subscribe to Maxwell, who was of the belief that forces only operate locally. My theory is that all forces on particles are a result of the Kha field with which the particle is in contact. This implies an entirely new theory of the forces in the universe.

First, we will look at a combination of two neutrons in close contact. Each neutron will bring a gravitational Kha field with a definite energy, and these energies will be preserved. The combined field will not be a superposition of the two fields, because that would not bring equilibrium. In addition, the total energy density at the place of contact would be doubled, which would cause a huge attraction.

The two fields do not mix. They deform and reduce their area, in order to bring equilibrium to the combined field. The binding energy of the neutron is the internal field energy that the neutron has lost in the combination. The binding energy is transferred to the external Kha field, called the gravitational field, from the pair of neutrons. From formula (1) we see that a compound of particles with a greater radius, r_0, will give a greater *e* in the same distance *r*. Thus, the gravitational field does not penetrate into the neutron. A calculation of the energy density along the field lines of the entire field could probably be made with the help of a computer: here, I will make only a simplified estimate.

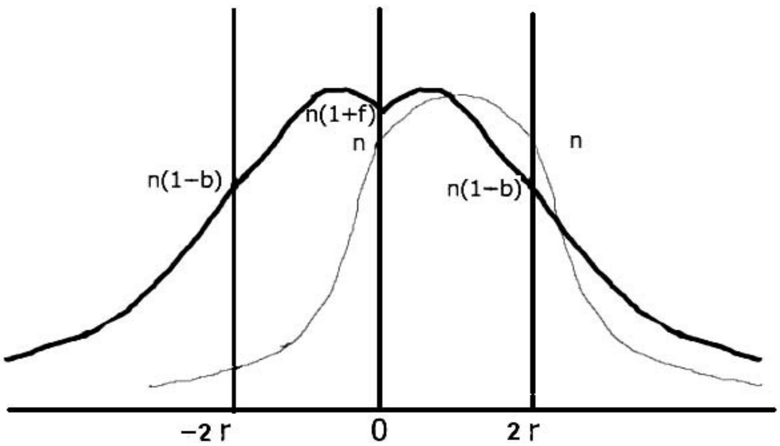

Figure 5

The figure shows the energy density along the axis. The thin line is the energy density of one free neutron to the right, according to formula (2). The fat line indicates the combined energy density of the pair of neutrons. The energy density at the front of the neutron is *n*(1+*f*) and at the back *n*(1- *b*). The front half has a relative increase in energy, *f* and the back half has a relative decrease in energy, *b*. The total relative decrease in energy is equal to the binding energy relative to the neutron energy. The binding energy of the neutron measures approximately 1 MeV by measurement.

$$\tfrac{1}{2}(b\text{-}f) = 1 \text{ MeV} / 940 \text{ MeV} = 1.1 * 10^{-3}$$

The binding energy is the work that would be required to separate the pair of neutrons. We can suppose that the energy density (pressure of attraction) on the axis applies to an area r^2 on the surface of the neutron. The force, F on the neutron will be determined by the difference between the energy density in the front and the back. We multiply the force by the distance r and calculate the binding energy

$$F * r = \tfrac{1}{3}\, n\, (b+f) * r^2 * r = 1 \text{ MeV} = 1.6 * 10^{-13}$$

When we put $n = 1.8 * 10^{34}$ and $r = 10^{-15}$, we get

$$b+f = 2.7 * 10^{-2}$$

From these equations we get $f = 1.1 * 10^{-2}$, $b = 1.7 * 10^{-2}$ and $F = 160$ N.

The force of attraction on the neutron is the strong nuclear force, called the gluon force.

Atoms

Traditionally, the hydrogen atom is composed of a negative electron cloud attracted by a small positive proton. According to the Kha theory, the electron is a light quark, which means a field rotating with the speed of light and mixed with a non-rotating, neutral additional Kha field. The positive Kha field round the proton forms another light quark. The two light quarks, having opposite charge and opposite spin, make a neutral atom (Rasmussen, 2019).

By far the majority of hydrogen’s mass is found in the proton nucleus. The proton mass is close to the neutron mass. We can use formula (1) to calculate the energy density at the surface of the Hydrogen atom

$$e = 1.8 * 10^{34} * (10^{-15}/10^{-10})^2 = 1.8 * 10^{24}$$

Next we will examine two hydrogen atoms close to each other. The Kha field can be estimated as we did for two neutrons. f and b have the same value. We find the attractive force like we did for neutrons. $F = 160$ N. The force on the atom has the same size as the force on the nucleon; this must be so because the Kha field of the atom must be in equilibrium. The force on the atom is called covalent and traditionally described as a force between electrons. Here, we explain the force as an effect of the Kha field. I believe that all inter-atomic forces might be understood as properties of the Kha field.

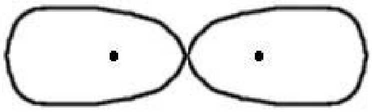

Figure 6

Figure 6 is a sketch of the H_2 molecule. The energy densities are the least at the back ends, with the least (negative) pressures on the neutron. However, this is compensated by a greater surface area at the back ends of the deformed atoms: in this way, equilibrium is established. We find the H_2 binding energy in the same way we did for the neutron pair. We multiply the force of 160N by the radius of the hydrogen atom, approximately $5*10^{-10}$, and get

H_2 binding energy= $160*5*10^{-10} = 5$ eV (experimental value 4.5 eV)

The binding energy of atoms is called the chemical bond. Probably all chemical bonds could be explained by the Kha field.

Bodies

When we look at bodies composed of many atoms, calculation of the Kha field seems complicated. Let us consider two massive iron spheres with radii 0.1m in close contact. From the mass density, $7.88 *10^3$, of iron we find the mass, 33, of the sphere. Newton's law of gravitation does not explain the origin of gravity, but it gives a precise value of its force. From this law, we find the force on the iron spheres.

$$F = G * \frac{m^2}{r^2} = 6.67*10^{-11} * \frac{33^2}{0.1^2} = 1.8*10^{-6}$$

The Kha field at the surface of an isolated iron sphere has an energy density *i*. In order to determine *i*, I will assume that iron spheres can be treated similarly to neutrons and hydrogen atoms. Thus, *f* + *b* have the same value as before.

$$F = {}^1/_3 \; i * (f+b) * 0.1^2$$

$$1.8*10^{-6} = {}^1/_3 \; i * 2.7*10^{-2}*0.1^2$$

$$i = 2.0*10^{-2} \text{ J/m}^3$$

Compare that to the traditional gravitational field strength, $g = F/m = 1.8*10^{-6}/33 = 5.5*10^{-8}$ N/kg. Both kinds of gravitational field strength obey the distance law (2) but they have different natures, as we see from their units.

At the surface of the Earth the traditional gravitational field strength is $g = 9.8$ N/kg. We might calculate the Kha gravitational field strength, e_{earth} by thinking of two earth spheres with radii $6.4*10^6$ and mass $5.9*10^{24}$ in close contact. The force of attraction is

$$F = G * \frac{m^2}{r^2} = 6.67*10^{-11} * \frac{(5.9*10^{24})^2}{(2*6.4*10^6)^2} = 1.42*10^{25}$$

We use the the same value for f+g as before and get

$$1.42*10^{25} = {}^1/_3 * e_{\text{earth}} *2.7*10^{-2}* (6.4*10^6)^2$$

$$e_{\text{earth}} = 4*10^{13}\ \text{J/m}^3$$

The Kha field density may be compared to the energy density, of dry air $1.2*10^{17}$ J/m³.

Electrical forces

Let us examine electrical forces. Within a positive particle, there is a high energy density of the positive Kha field. Outside the particle, there is also a positive field, whose energy density decreases outwardly, following formula (2).

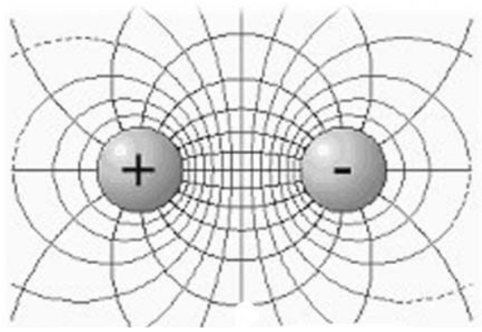

Figure 7

Figure 7 shows a traditional image of two oppositely charged spheres with field lines. We can consider it an image of two oppositely charged particles. The positive particle is surrounded by its own positive field, and the positive field is limited to the left half of the space. All the field lines run from one sphere to the other. Gravitation field lines always end in the distance, but electric field lines never do. The field lines are most closely spaced in the middle area between the two particles. The energy density is high here, on the facing surfaces of the particles. Thus, the particles attract each other.

We can consider the figure as a positive and a negative complete quark in the Kha field. A positive quark consists of the positive Kha field solely, and vice versa for the negative quark. An outer field is present outside each of the quarks. When the quarks are near each other, we can expect the outer field to be concentrated between them. The energy density of the outer field is equal to the energy density within the quark, which I take to be ¼ of the neutron's average energy density. The pressure (negative) on the quark's surface can be calculated by (2). The force is equal to the pressure multiplied by the area of the side.

$$F = pr^2 = \frac{1}{3} er^2 = \frac{1}{3} * \frac{1}{4} * \frac{1.7 * 10^{-27} * 9 * 10^{16}}{4/3 * \pi * (10^{-15})^3} (10^{-15})^2 = 3.1*10^3 \text{ N}$$

This is the very strong gluon force that causes the quarks to melt together. Using Coulomb's Law to calculate the electrical attraction results in only about 0.1N: this value is far too small. Coulomb's law cannot be used at small distances, where quarks or nucleons are close together.

We can try to calculate the work *E′* that must be performed to separate a proton and an anti-proton. Using Coulomb's Law, we obtain

$$E' = \frac{e^2}{4\pi\varepsilon r} \quad E'r = \frac{e^2}{4\pi\varepsilon}$$

where *e* is the proton's charge and *r* is the proton's radius. The proton and anti-proton are formed by quarks, and must, therefore, adhere to the following equation for quarks (Rasmussen, 2019).

$$Er = \frac{ch}{2\pi} \qquad (3)$$

We calculate the ratio of the two values of the work. We substitute the values of the universal constants *e, ε, c*, and *h.*

$$E/E' = \frac{2ch^2 €}{e^2} = 137$$

Thus, using Coulomb's law gives us far too small a value, with a factor of 137. The constant of 137, called the fine structure constant, has mystified many physicists. It shows that we cannot work with Coulomb's law at quark distances, only with gluon forces from the Kha. The fine structure constant of 137 gives the strength of gluon forces in relation to Coulomb forces.

Beta decay

A beta particle is an electron emitted from a radioactive nucleus. An example is the decay of a neutron.

$$n \rightarrow p^+ + e^-$$

This process has created all the protons and electrons in the universe. It is still responsible for many radioactive decays. Electrons have much less energy and much bigger size than nucleons. Thus, the beta process could not be driven by the strong, nuclear gluon forces. Instead, the process is said to involve weak forces. We will see that the beta process is an effect of the Kha field.

Traditionally, the beta decay is described in terms of quantum mechanics. It is supposed that a massive virtual particle W^- is involved. W^- appears in the neutron, take some energy and negative charge and changes the neutron into a proton. W^- creates an electron + an anti-neutrino and then vanishes rapidly. This explanation is excessive. The Kha theory of beta decay is fundamentally different

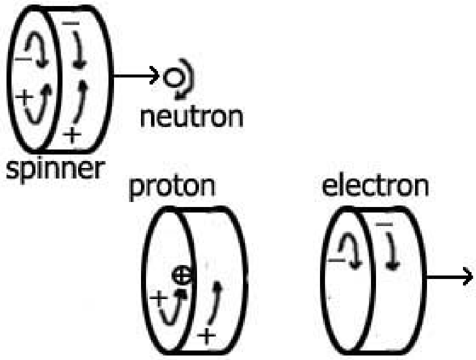

Figure 8

At the top of Figure 8, we see a spinner approach a neutron. The neutron's spin turns right, seen from the incoming side. It is not easy to calculate the behaviour of the fields when they penetrate each other but we can use the conservation of energy, charge and spin. The neutron contains a negative "down quark" farthest out and rather loosely bound. The spin of this down quark turns right and attracts the positive quark with spin left from the spinner. The positive quark neutralizes the negative down quark and replaces the neutron with a proton.

The proton has a fixed energy, which is 1.3MeV less than the energy of the neutron, but the proton includes a positive quasi quark round the proton, with a fixed charge and energy. Since the total charge in the beta decay is zero, a particle with the opposite charge and the same energy must be erased. That particle is the electron with resting energy of 0.5 MeV. Now, let us say that the quark pair has very little energy. Some of the released binding energy goes to the resting energy of the electron and the remaining 1.3-0.5=0.8 MeV goes to kinetic energy, mainly for the electron on account of its small mass. The maximal kinetic energy of the observed electrons is exactly 0.8 MeV.

Now, let us see what happens when a quark pair has additional energy (and charges). The two quarks in the pair had the same energy before the process and the outer proton and electron have the same energy. Consequently the two quarks in the pair have the same surplus of energy. The two surpluses could make an new quark pair, but that will probably transform into a neutrino pair very quickly. A positive quark needs a negative charged energy in order to transform into a neutral neutrino and the converse holds for the negative quark. The quark pair will take and divide the necessary neutral field energy. A neutrino and an anti-neutrino will be erased and there will be less kinetic energy left for the electron.

The Kha theory of beta decay seems to be in agreement with experimental results. The spectrum of electronic kinetic energy covers all energies from 0 to

0.8 MeV. It resembles Plank’s law, in agreement with the energy distribution of the quark pairs. The statistical nature of beta decay has been a mystery. Now, it is obvious that the collision of a quark pair and a neutron is a statistical event. The anti-neutrino in the traditional explanation is a purely theoretical idea; there might as well be two neutrinos.

Beta decay is said to violate the conservation of parity. However, this statement relies on the assumption that the neutron is symmetrical and decays by itself. In that case, the neutrons would emit electrons in two opposite directions. But electrons are only observed in the direction opposite to the magnetic moment of the neutron. From Figure 6, we can see that the preferred direction is determined by the direction of the incoming spinner. The magnetic moment of the neutron points opposite to the spin of the outer negative down quark.

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