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Abstract
A new presentation of the authors older claim is shown, adding figures. There is only one, but not three neutrinos. The model is a superposition of three quaternionic scalars of a spin-like measuring Gleason frame base triple. The Heisenberg uncertainties require that the different masses need a change in time. Only one of the three neutrinos is observable according to the Copenhagen interpretation. The difference in masses is due toe adding inner frequencies, using $mc^2 = hf$.

Keywords: Gleason Measure, Neutrino, Oscillation

INTRODUCTION

In the references article the author suggested that the neutrino oscillation is actually a superposition of three neutral leptons having three different masses [16]. A first observation is that the mass measured in kg is replaced in the neutrinos time dependent geometry by a frequency f in form of a winding number for a cylindrical helix line. The different masses are replaced by one, two or three windings of the helix. In figure 1 for three *kg-whirl* generated windings as dark whirl is shown.

Rescaling numbers are chosen below differently, also the transfer from frequency to mass is beside the Einstein scaling formula like the electrons Bohr radii energies in atoms. The neutral leptons three masses are as weights in kg attached to a Gleason measuring frame as orthogonal triple
$m = (m(\nu_e).m(\nu_\mu),m(\nu_\tau))$ [3,5]. It replaces a spin triple $s = (s_x, s_y, s_z)$ with lengths $|s_j|$ as weights of the s_j.

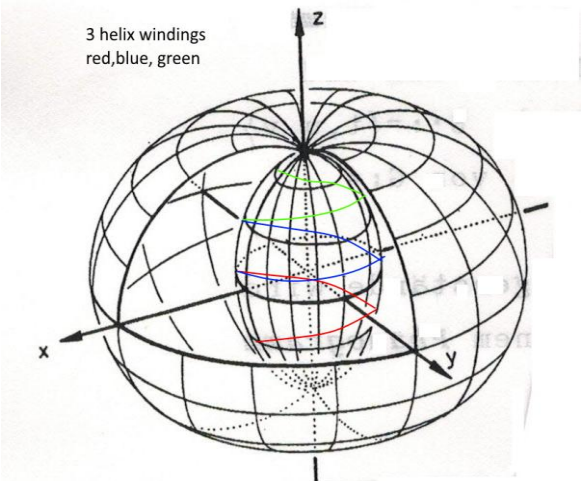


Figure 1 spindle torus for a neutrino; on the spindle are three helix windings like electromagnetic wave helix lines, here for the periodic kg oscillation in time

The windings are for energy E = hf units E = h, E = 2h, E =3h, h the Planck number, through a spiralic rescaling (figure 2). The three radii as length rescaling AP_j occuring for the one neutral lepton as neutrino P (having three masses as weights attached in a time dependent spiralic pendulum rotor) can also be described in higher octonian dimensions as projections P_1 , P_2 , $P_3$of the neutrino into space, - in figure 3 drawn by adding a xy-plane with P having different heights along the (octonian) z-axis above the xy-plane.

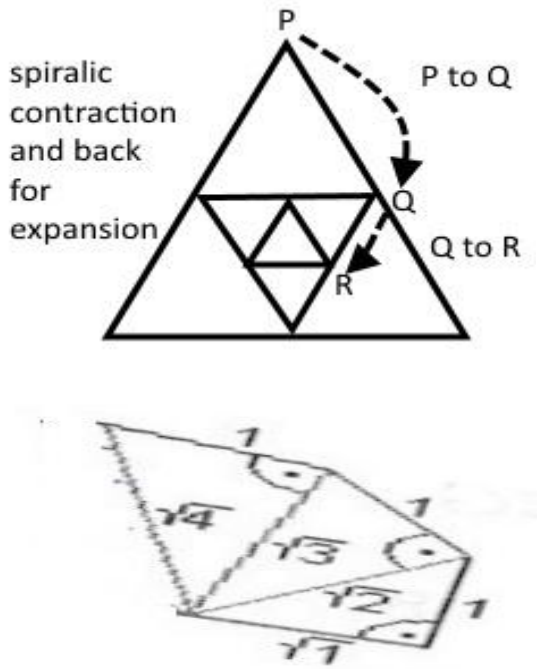
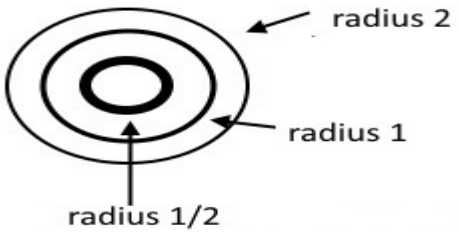


Figure 2 rotation-contraction or -expansion for the three neutral leptons P discrete states in time (at left); Bohr radii r for P are sclaed to $r^2 = 1$ or $r^2 = 2$ or $r^2 = 3$ as Minkowski special (metrical) relativistic rescaling of mass through the helix frequency windings (figure 1) with one winding for mass at rest, two windings for the middle kg weigth and three windings for the large mass weight



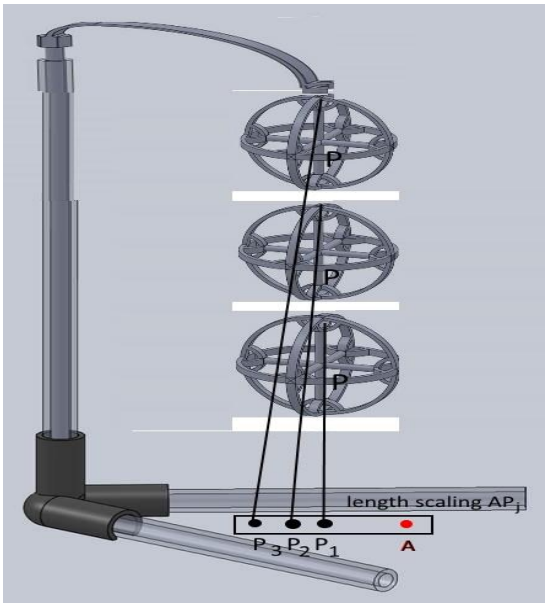
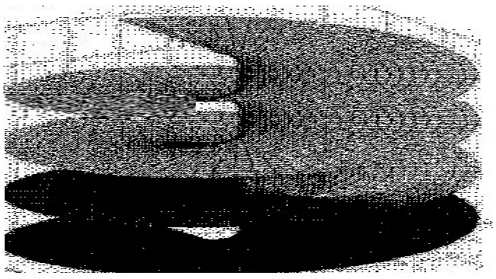


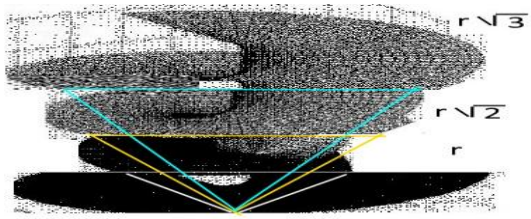
Figure 3 length rescaling of a neutrino mass for its three Bohr radii (rescaling numbers are arbitrary chosen)

MATERIAL AND METHODS

The helix windings can be demonstrated geometrically by the surface presenting the four values of the 4th roots of unity. The usual way is that four complex planes 1,2,3,4 are cut along their negative real half axis and pairwise glued together at these rays in a cycle upper 1 ray with lower 2 ray, upper 2 with lower 3, upper 3 with lower 4 and upper 4 with lower 1 (figure 4 left). To this the kg-whirl contraction or expansion for the radii of the planes 2,3,4 windings is added (figure 4 right).



surface with 4 complex planes for the 4th roots of unity, joined along the negative real half ray, the upper free one is joined with the lowest free one



spiralic whirl rgb-graviton contraction of the neutral lepton spindle which allows three Bohr radii for its states; for r is one helix winding, for $r\sqrt{2}$ two, for $r\sqrt{3}$ three

Figure 4 Riemannian surface for complex 4th roots of unity at left, at right frequencies
$f_1 = 1/1$, $f_2 = 1/2$, $f_3 = 1/3$, for circular windings n in time t as n = 1,2,3; for radius r is one winding, for $r\sqrt{2}$ two windings, for $r\sqrt{3}$ three windings; the figure at left is also for rgb-graviton whirls

The electromagnetic EMI exponential wave function exp(i(ωt+xk)) description adds projective geometric to its cylinder at projective infinity one point which is in the spindle figure replaced by two whirls on top and bottom of the cylinder. The EMI case is for dark energy where speeds c of their frequency are on the surface, mathematical inverted to other speeds: outside they are in the universe v<c, inside the spindle v‘>c with v‘v = c^2. The P spindle has a *mixed* geometry of this where to dark energy whirls, belonging to sound and temperature (phonons) have no helix winding. For them a double cone as known for the Minkowski metric is closed at projective infinity by a circle.

The P helix windings are like LASER and in the periodic time rotor for P reflected at the endpoints of the spindle. In the above wave description it means that the time reversal operator T of physics reflects (like a spin up or down change) at the ends of the spindle its orientation, t as +t in the above figure is reflected to T(t) = -t. Projecting this on a cross section circle in the middle of the spindle means that the first helix expansion for t is counterclockwise and for -t clockwise. - Environmental time independent of this T rotor is running as usual.

For the higher dimension of an octonian description of energies, the references can be consulted.
The doubling of quaternionic coordinates, abbreviated as 1234 (4 is time, 123 space) is for a projective Einstein mass-frequency plane 56 (5 a mass coordinate for kg, 6 a frequency coordinate for Hz measures). Since the usual blow up from quaternions SU(2) to the SU(3) symmetry of the

strong interaction SI is 8-dimensional, this vectorial expansion is used, but the matrix mulitplication for the SI matrices is different from the octonian multiplication. A positive effect for this choice is that

several important Gleason measuring base triples like the above spin triple exist for octonians.

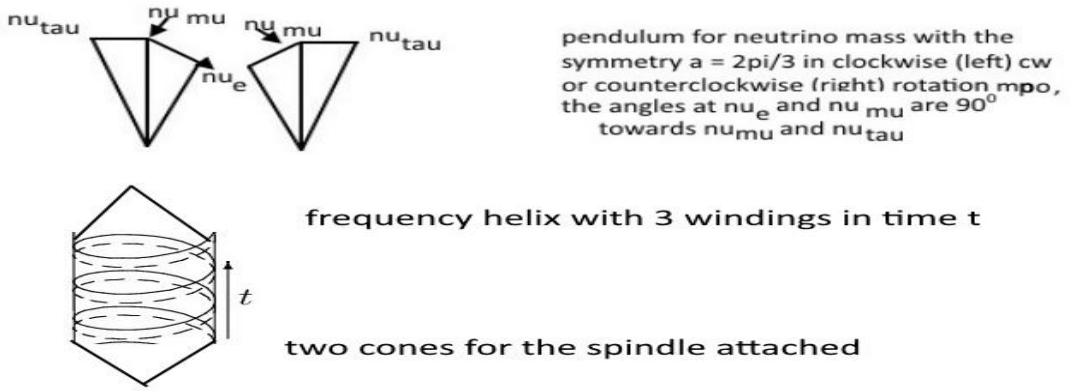


Figure 5 pendulum contraction, expansion, below a spindle with 3 frequency windings in a state of the oscillating neutrino nu $_{tau}$, 2 windings are for nu $_{me}$ and 1 winding is for nu $_{e}$

This way the kg-whirl triple, also a rgb-graviton whirl 126 triple for color charges of nucleons and electrical charges EM leptonic triples, named as 145 in octonian coordinates, exist. The EM measuring whirl has a similar superposition with the spin whirl as for P: the spin vector s, for instance locally in s = s_z space direction is for the EM case in superposition with the magnetic momentum while the helicity of P has its momentum in superposition with s. The inner rotation of the neutral or EM charge, presented on a circle is for negative EM or counterclockwise neutral charges direction and the magnetic momentum or the momentum are in opposite orientation to s on their common coordinate line. For their antiparticles the clockwise rotation means that the leptonic vectors show in the same direction as spin.

This is known as the EM gyromagnetic relation, replacing the P helicity. For the EM case it is also necessary that the spin axis is leaning in an angle, for instance of 45 degrees towards the rotation axis of a torus in the Hopf fiber bundle presentation where a point charge is blown up to a leaning circle which traces out in rotation a torus. The Hopf figures are due to the Hopf map which reduces the spacetime coordinates to space coordinates. The 2-dimensional Riemannian sphere obtained for the EM charged particle energy is further stereographic projected down to a xy-plane, where for instance the z-coordinate of space is set to z = 0. The projective norming is from complex 1234 (z_1 = z+it, z_2 = x+iy) spacetime coordinates to $z_3 = z_2 / z_1$ for $z_1 \neq 0$ and the stereographic point ∞ for the complex Riemannian sphere S^2 is for $z_1 = 0$. As well the 3-dimensional EM field lines version for particles as the 2-dimensional S^2 projection are observed for electrons on different shells of an atom.

Changing dimensions for energy locations and particles is known since more than 100 years, but the projection maps Hopf figures are not respected from physics or chemistry. Reversing the blow down to a blow up of dimensions means that from energy computations in a complex $w = z_2 / z_1$ plane the quaternion Pauli matrices arise for presenting the complex $q = (z_1, z_2)$ spacetime. The complex cross product adds to this an orthogonal plane $z = z_2 \times z_1$ and the quaternionic (q_1, q_2) octonian space extension is due to the Cayley-Dickson construction such that SI can be accomodated with its 8 gluons, belonging to the 8 SU(3) generating matrices. As complex space it is applying a second time the complex cross product for $z_4 = z_3 \times z_2 \times z_1$. Another functional exp z_4 coordinate for waves is needed. This is a circle U(1) for EMI/light cylinders as a rolled Kaluza-Klein coordinate. For setting measuring unit vectors on the z_3 coordinates, the second z_4

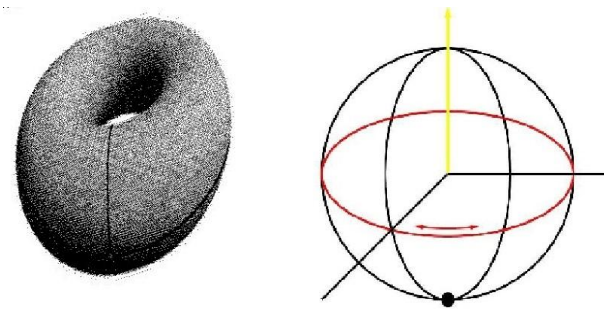


Figure 6 3-dimensional Hopf torus at left, 2-dimensional Hopf projection of the 3-dimensional Hopf (unit) sphere S^3 onto S^2 at right coordinate is introduced.

The coordinate $z_4$acts like a compass and sets by suitable symmetries the manyvalued weights of particle series: turning the vector discrete with the location of nth roots of unity on the circle means that EM leptons can have normed positive or negative 1/3, 2/3 and 1 charges (third or sixth roots of unity),

six kg masses for fermion series, six color charges for quarks, six basic energies arise through a Feigenbaum bifurcation which has in a last not chaotic step the bifurcating SI with 8 gluons. The six valued functions are also used as atmospheric shelters and hemispheres of Bohr radii shells about a central atomic kernel. They cary in their center an energy vector which can turn in up (outer) or down (inner) direction towards the 3- or 2-complex, real 4-dimensional ball like sphere S^2. They also act for the energy exchanges of the ball with its environment. Turning between up or down direction for emiiting or absorbing energy occurs by a 360 degree rotation on a projective planes Moebius strip. For the boundary of the hemisphere are opposite points +p and-p on the bounding circle identified.

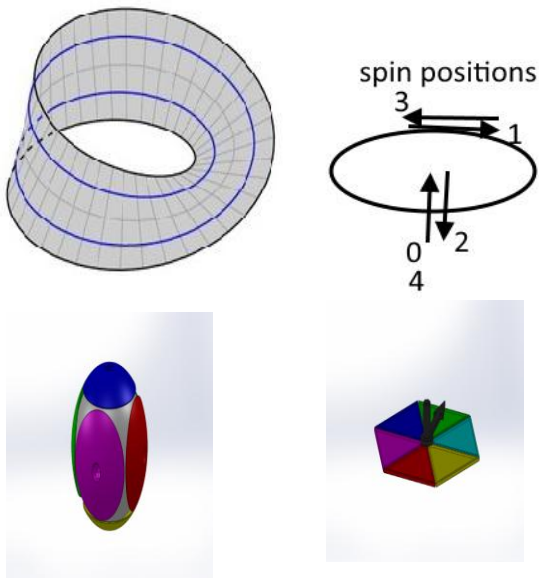


Figure 7 Moebius strip upper left, changing spin positions on it at upper right, lower left compass, lower right hedgehog polar hemisphere caps of a solid (deuteron or atomic kernel) ball

RESULTS AND DISCUSSIONS

Until now there is no discussion about this model. On the other hand physics has no explanation of the neutrino oscillation as presented here through superpose them in a measuring Gleason frame with quaternionic scalars.

CONCLUSIONS

The model should be tested by experiments. A more precise measurement of the neutrino mass can possibly give as result the added three masses of the neutrinos.

If a longest exisiting smallest mass can be measured, the added windings can be equal proportioned to the sum of the masses. Free neutrinos can be different from their occurence in the weak decays. It is assumed that the smallest mass occurs for this.

Gleason frames are used for spin, carrying as measures quantized spin length. The change of spin direcestions is of the same kind as postulated here for neutrinos, but the scalars are in this case real numbers. Gleason frames can also have complex numbers as scalars. This is used in the references for getting the six masses of the fermionic series [1]. The conjugation operator of physics generates then the 12 series. For neutrinos this operator generates one antineutrino from the postulated neutrino.

Gleason frames are a new tool not used until now in physics. They guide more general the description of quasiparticles. Often the change of vectorial directions occurs through projective rotations on a Moebius strip. Beside the use of projective geometry, the dimensions for the model have to be doubled from spacetime to octonians. They have seven Gleason frames as well as the SU(3) strong interaction symmetry. The multiplications of octonians and SU(3) matrices are different. The octonians allow instead of the 8 gluons of SU(3) 8 energies: color charge, electrical (or neutral) charge, temperature, rotational, kinetic energy, mass and candela for light. For the electromagnetic interaction one linear octonian coordinate is projective closed by a point at infinity to a Kaluza-Klein circle. This rolled coordinate is used for the helix lines in figure 5. It allows to add exponential, functional wave like descriptions.

Suggested is: use for the quantum range projective geometry, projections of different kinds which allows changing dimensions of energy systems in different states, use Gleason frames as measuring apparatus in many cases, extend the vectorial dimensions to 8 from 4. Not discussed is in this article many new finite symmetries.For the neutrino a cyclic group of order 3 occurs in the pendulum of figure 4. It extends to a noncommutative D_3 group of order 6 though the use of the first Pauli matrix, a reflection.

Beside the quoted references there are no other publications on this subject.

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