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Review Article

Superpositions of Quanta Measuring Bases

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Abstract

In earlier publications the author has mentioned superpositions of the measuring Gleason frame base triples. The study can be a theme for a research student or project. Some results are collected in this article as possibilities. Equations are added to such superpositions and spaces like the oriented Riemannian sphere S^2, a projective plane P^2 or of R^3. Different kinds of generating physical equations are listed. One popular method is to use the real or complex cross product, measuring the area spanned by a 2. dimensional pair of vectors. For higher real or complex dimensions the same method applies.

Keywords: Fano Memo; Angular Momentum; Physical Equations

The Fano memo triples

Figure 1: Fano memo; the three points on an interval present a 3-dimensional measuring, orthogonal base triple, seven octonion coordinates ej are in the memo and the eight is put as input energy at the left of the Fano figure; the circle is the line for space 123 inzides xyz-coordinates, 4 is time.

The Gleason frame GF bases generate a Gleason measuring operator and carry at the three vectors endpoints a weight for measuring an energy presented by the vector. Some measures are for 1 meter or Ampere, for 2 meter or Kelvin, for 3 meter or Joule (rotation), 4 time second or magnetic energy TESLA, 5 mass kg, 6 frequency Hz, 7 electromagnetic interaction cd. As real cross product a GF can have two of its vectors weights multipied for the area A they span. The third vectors length is |A|. A list of possible superpositions of two GF in one coordinate is given first.

1a Spin 123 and magnetic momentum 145: the gyromagnetic equation GE with the 2-dimensional unit sphere S^2 for signed orientations is obtained; spin is generation Euclidean xyz-space coordinates. The description for GE is in another article of the author and too long for repetition. The magnetic vector is parallel or antiparallel oriented on a space coordinate to the spin vector. A good system of equations for electromagnetism EM are the Maxwell equations.

1b 123 and 167: a clockwise cw or counterclockwise mpo rotation on a U(1) circle for 7 has in the universal cover an induced 3-dimensional lefthand or righthand helix (photon) rotation on a cylinder for the electromagnetic interactions EMI frequency in R^3. The EMI equation is $\lambda f = v$, λ wave length on 1, $f = 1/\Delta t$ (Δt time interval) frequency (kinetic energy) on 6, time integrated to speed $v = \Delta x/\Delta t$, Δx space interval. For EMI the bound is $v = c$, for matter waves holds $v<c$. 23 can span for the cylinder a transversal plane containing the circle U(1). The exponential function exp is introduced for waves through the 2 to 7 map of a complex polar angle $\varphi \rightarrow \exp(i\varphi)$; generation of polar (r,φ) complex and $z = x + iy$, xy-coordinates. In differential form, the EMI waves, observable as cosine projections, and the Schroedunger matter waves are good equations. The transfer was done by Schroedinger, using the substitutions for λ, ω.

1c 145 and 167: The equation is $\lambda p = h$, λ wave length at 1, p momentum at 6, h Planck constant cross product measured by 7. Schroedinger used this to substitute the wave number $k = 1/\lambda$ for electromagnetic waves by the matter waves momentum p. The position-momentum uncertainty 15 relates to this. Both equations, 1b, 1c are cross product induced. 16 or 15 span an area and the third cross product vector 7 or 4 has length $|v|$ or h.

2a 123 and 246 heat equation $pV = T$, p pressure on a volumes V contour, T temperature 2; the volume integration (also van der Waal equation) is for entropy T (phonons, also used for accustic whirls) inside the volume 123. Spherical (r,φ,θ)-space coordinates for 123 are generated with a bounding sphere S^2 and r as radius of a ball volume inside. Phonons transfer in a medium energy momentum 6. There are many preservation theorems. One (Bernoulli) is for m mass, ρ density, $mp/\rho + E_{kin} + E_{pot} = \text{constant}$, with kinetic and potential energy added to pressure energy on 3 as spherical angle θ; as GF can be taken 356 (5 E_{pot}, 6 E_{kin}), having as sum of three weights a constant value. If pressure energy is 0, the preservation is for kinetic plus potential energy kept constant.

Geometrically, the three states solid, fluid, gas of matter systems use not only variables for a functional description, but also parameters as suggested by catastrophe theory. The cusp catastophe allows in the control space sudden changes as observed for water as an example (see 3b). There are many differential equations for heat transfer for different geometrical shapes of systems.

2b 123 and 257 $\varphi J = h$ angular-angular momentum uncertainty. 2 is for the angle φ, J on 3 rotational energy is integrated to angular momentum. The area h of φ,J is measured as in 1c by 7.

3 with angular speed $\omega = 2\pi f$, is substituted by f 6 and f is substituted by mass 5 by using $mc^2 = hf = h\omega/2\pi$.

2c 246 and 257 as in 2a, preservation of energy as $E = E_{kin} + E_{pot}$ for orbiting systems kinetic energy 6 about a central system having a gravitational potential 5 (with 126 rgb-graviton whirls as field quantums). This energy preservation is used in the Schoedinger differential equation for matter waves. and wave packages.

3a 123 and 347 $E = h\omega/2\pi = hf$ time-energy uncertainty, 3 is for ω, 4 for f as (momentum 6 and) an inverse time interval Δt, and 7 measures as cross product $E\cdot\Delta t = h$. 3 can present angular momentum. 4-dimensional spacetime 1234 gets the Minkowski metric. The Euclideam 123 space metric as quadric $x^2 + y^2 + z^2$ has for its time extension a critical point of its manifolds Morse function. Time on 4 in 347 is an imaginary, not a real number by adding to a Euclidean version $<u,u>$, $u = (x,y,z,t)$ for 1234 a time reversal operator T with conic quadric $<uT,u> = <(x,y,z,-t),u> = x^2 + y^2 + z^2 - t^2$.

3b 123 and 356 L = rxp, rotational energy preservation of angular momentum E_{rot} = constant with Kepler's second law associated. His planet-like system P orbits in case of rotation of P about a barycenter or sun-like central system Q as conic sections in form of circle, ellipses, or the escape conic sections as parabolas, hyperbola branch need a nonlinear Schwarzschild rescaling of Minkowski to Schwarzschild metric by using the Schwarzschild radius Rs of Q and $\sin^2\beta = Rs/r$.

$Rs = 2Gm/c^2$ is as constant radius of Q on 3 measured by using a 56 cross product for the triple $G,m,(1/c^2)$ a GF , 5 as gravitational constant G and mass m, and setting the square of the second cosmic (escape) speed (on 6) of Q equal to c^2. Rotations 3 of P about Q need a P speed v (on 6) with the squared first cosmic speed $v_1^2 = |\varphi_G| = Gm/r$ as lower bound on 5. The Zeeman machine for a gravitaitonal wheel uses as catastrophes cusps with three potential levels on which P can move. At crictical cusp lines or points, sudden potential jumps occur for P where its speed v is bounded by v_j, j = 1,2. The cusp potential $V = x^4/4 + ax^2/2 + bx$ has one variable and two parameters (associated with the v_j) and the catastrophe (critical points) manifold $x^3 + ax + b = 0$. The 3-dimensional (x,a,b) allows a 2-dimensional (x,a) chart where $b = -x^3 - ax$ can be eliminated.

As Thom catastrophe, the elliptic umbilic is used. Concerning the use of variables in V and parameters, for the Zeeman gravitational machine the use of x is as a variable. Setting x = s for a parameter s, a parabola point is (s,s^3) and a normal to it has an equation s^3 + as +b = 0 where the parabola has center of gravity at (a,b) and which tilds until (s,s^2) is on the ground. The dynamical behaviour of this cusp is the same as for the Zeeman machine. However the Zeeman machine has four such cusps (Figure 2). I shows in particular the elastics stretch and squeeze properties of gravity.

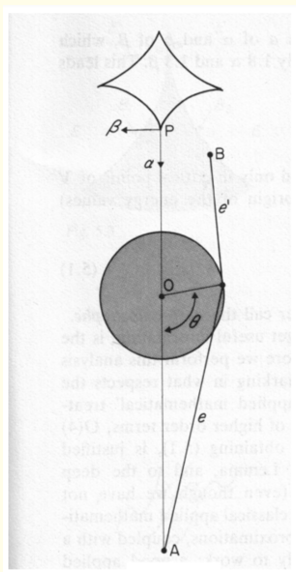

Figure 2: Zeeman machine.

In a real projective plane [u,v,w], the variable v = r can be taken as a perspective parameter. It is a measure for the distance |QP|. The above Schwarzschild radius Rs of Q as a central system with the comon barycenter inside its volume is a bound for the parametric, unsymmetric measure u = r - Rs for |PQ|. A perspective central projection is responsible for this. 6 as frequency has as conjugate c(b) of blue b 6 and color charge yellow the complex cross ratio (z-1) symmetry, scaled with r = z (color charge symmetry of 5 mass) and 1 as Rs to (r - Rs). The projective plane for 56 has for P,Q the norming to [(r-Rs), r,1]. Its line at infinity is [(r-Rs), r,0], projective normed to [(r-Rs)/r,1,0]. The nonlinear Schwarzschild factor for norming Minkowski metric is obtained by an associated perspective projection. From the GF 356, the color charge symmetry for 3 is (z-1)/z, a rotation with its coefficient matrix order 6 (first row (1 -1), second row (1 0)). There are six complex cross ratios as invariants of the Riemannian spheres Moebius transformations. Cross ratios are perspective projections. For the gravitational potential z = r is inverted by the cross ratio 1/z (associated with 1 in 123 above) and suitably scaled to φ_G. In the Einstein computation for the rosette motion of a rotating system P the main diameter d of the Kepler ellipse is shifted by a periodic angle φ_0. This can be interpreted as a gravitational acceleration of the speed of P, modifying the P orbit and the second Kepler law. Concerning the third Kepler law, the time T for a revolution satisfies $T^2/(d/2)^3$ = constant. The cusp has for its parameters a,b replacing (d/2), T the equation of a parametrizations cusp curve $4a^3 + 27b^2 = 0$ in the control space. Renorming this is Kepler's third law, considered for a cusp and its catastrophes potential.

Figure 3: Six catastrophes potentials geometries cusp, swallowtail, butterfly, elliptic, hyperbolic, parabolic umbilic; the 7th catastrophe is the fold having the critical manifold x^2 +a = 0 and potential $V = x^3/3 + ax$; it uses x for a chart of the parabola manifold $(x,-x^2)$.

3c 347 and 356, generation of Minkowski metric by the Minkowski cone $r^2 = c^2t^2$. Use 3,6 in 356 for the ω = 2πf energy equation, 4 and 3 (time and radius) in 347 for the cone equation where r^2 can be 3-dimensional extended to $r^2 = x^2 + y^2 + z^2$ for xyz-space 123. The special relativistic speed v 6 between two mass 5 systems P,Q in 356 not in gravitational interaction is used for rescalings of measuring units in two coordinate systems of P,Q and is the momentums optical computed speed with which a wave package moves in its environment. 46 in 246 is for the Heisenberg uncertainty time-energy and 67 is in 167 for the helix line frequency 6 on a cylinder with rolled U(1) 7 as transversal section. 57 occurs in 257 for mass, setting a barycenter for mass inside a gravitational equipotential circle. 45 was the magnetic/induction area integration under 145. The 35 part of 356 is for the SI rotor cone tips letting 6 as E_{kin} vector blue move between two changes of nucleon states.

37 and 47 as parts of 347 can be used for Lissajous figures as circle 7 where two orthogonal ω frequencies 3 hit and 47 for EMI 7 acts with photons emitted or absorbed for magnetism 4 of electrical charged particles enegies, for instance in Coulombs law $F = aQ_1Q_{2/}/r^2$ and Lorentz force F = Q(vxB).

4a 145 and 246: 145 has the measuring cross product for induction when a magnetic field crosses the area of an electrical currents loop, 1456 is a 4-dimensional space for EM and the weak WI rotor (missing the strong SI rolls 23) as 4 roll mill. The polynomial $x^2 - y^2$ is for the 4 roll mill and shear. Geometrically it can present EM as Hopf unit sphere S^2 where 1 is a rotating by 6 as ω electrical charge on a latitude circle of S^2, 4 is a magnetic momentum aligned with spin on the vertical z-axis of S^2 attached at the north pole of S^2 and 5 carries the mass of the lepton. Observe that neutral leptons have another geometry, where magnetic momentum 4 is replaced by momentum 6 as E_{kin} and 1 is substitued by neutral charge 3 E_{rot}.

4b 145 and 347 (see also 3c) area A integration of magnetic field strength $\Phi = \int BdA$ (45 in 145), right hand rule F = Q(vxB) Lorentz force, Q electrical charge 1, v speed of the electrical charged particle for its momentum, B induction 5 and 347 is for Lissaous figures.

4c 246 and 347 frequency 6 proportions n:m (natural numbers) in time expansion 4 on 3 as EMI circular 7 cylinder axis for Lissajous figures, accoustic 2 whirl phonons transfer energy and momentum 6 in time 4. Geometrical, dihedrals having n poles as points (roots of unities) on a circle, symmetry of order 2n with a rotation of order n and n reflections, describe possible Heegard decompositions of the Hopf sphere S^3 with no pole for n = 0, 1 pole for an EM torus, 2 poles for quarks, 3 poles for a nucleon, 4 poles for the 4 roll mill and 6 poles for the 6 roll mill.

5a 145 and 257 EM_{pot} 5 integration $\int b/r^2 dr = - b/r$, $b = Q_1Q_2/4\pi\varepsilon$ electromagnetic potential integration, r radius (on 1), Q_j electrical charges, ε electrical field constant (on 1), 4 magnetic momentum as cross product of 15. The superposition of 5 with 257 is

5b 145 and 356 E_{pot} $\varphi_G = \int Gm/r^2 dr = - Gm/r$ gravitational potential integration, m mass, G gravitational constant, rescaling of Minkowski to Schwarzschild metric by the cosine factor of $\sin^2\beta = Rs/r$, r radius, $Rs = 2Gm/c^2$ Schwarzschild radius of a mass system, first and second cosmic speed, quark 2 roll mill.

5c 257 and 356 is for SI rotor dynamics, 2356 is a 4-dimensional space (missing the 14 weak WI rolls) for the SI Kern fiber bundle, projecting S^5 as part of the SI geometry down to the complex 2-dimensional space CP^2 with fiber S^1. The dynamics for nucleon states is a presentation of the quark triangles symmetry D_3, permuting three quark points r (for 5), g (for 3), b (for 6). The nucleon has invariant neutral color charge rgb. The above mentioned setting (by Higgs) a barycenter for renomred nucleon mass inside a gravitational equipotential circle by 257 uses the circumference of the quark triangle. Barycentrical coordinates are generated by the SI rotor for this. For a quarkgluon flow inside a CP^2 the 6 roll mill acts as catastrophe for which the space is extended to the energies space 123456 of color charges.

6a 167 and 246 possible items are: kinetic speed integration $\int dx^2/dt^2 = - \Delta x/\Delta t = -v$, momentum transfe 6 by speed 2 in time 4 (accoustic), EMI for 167.

6b 167 and 356 possible items are: rotational speed 3 integration $\int d\varphi^2/dt^2 = - d\varphi/dt = -\omega$ and 56 $mc^2 = hf$ plane 56 (356), generation of 167 EMI cyclindrical polar (r,φ,z)-space coordinates.

6c 246 and 356 wheel 23 (complex z = x+iy coodinates), quaternionic rotor dynamics with 356 where three pairwise orthogonal wheels in the xy-, xz-, yz-plane generate the third missing space coordinate as rotation axis and where the rotations can be cw or mpo, six possibilites as for the SI rotor. Used are Euler angles for the quaternions generation.

For 7 the supepositions of 167 have been with 123, 145 (1) and with 246, 356 (6). There is a possibility for 7 as 167 with 257, 347, where all three Einstein revisions of general relativity occur. They arise when EMI light 7 is generated in the evolution of the universe. As output of atoms energy (see electron jumps on Bohr radii, spectral series) the world line of EMI can be broken as interaction with another medium, for a system rotating about a central mass system, its speed is gravity accelerated by adding a constant angular shift to its main ellipse diagonal, and third gravtiy reduces EMI frequency in its time expansion for redshift.

7a 167 and 257 Energy absorption or emission of EMI frequencies 6 is obtained by braking through its interaction with another energy system (medium) the cylinders 167 axis 1 and adding or emitting part of its new energy. Adding energy is when EMI energy passes by huge mass 5 stars (see Einstein's general relativity). 7 is as usual the cylinders transversal section. 2 can be a constant angle φ_0 in which the axis is broken, depending on the medium (double lensing).

7b 167 and 347: 347 was above used for the Minkowski quadric $r^2 - c^2t^2 = 0$ as metric, introducing imaginary time and for time reversal in the energy (time interval) inversion form E = hf. The nonlinear rescaling by the Schwarzschild radius Rs of the Minkowski metric is described in 3b. For computing the factor Rs/r = $\sin^2\beta$ (as radius 1), the second cosmic speed of a central mass system Q is set to speed of light c (as 7) and gravity as frequency 6 transformed mass is scaled by the gravitational constant G for Rs = $2Gm/c^2$. The rosette motion of a system orbiting about Q is described in 3b. A perspective 126 projection through the rgb-graviton wave presentation, having speed c, introduces Rs. 2 in 126 substitutes for 7 in 167. The quadruple energy momentum 6 tensor is substituted by 3 for the rgb-graviton projection of the SU(3) first three GellMann 3x3-matrices to the SU(2) three Pauli matrices on 123. A linearization of the Rs factor is possible through the central projection in figure 4 in homogeneous projective coordinates.

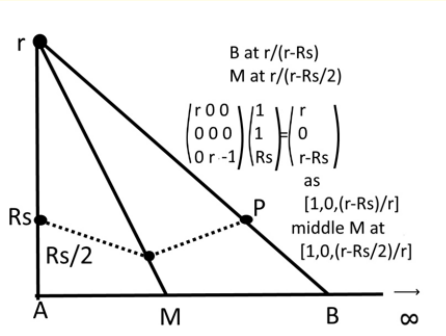

Figure 4: AMB∞ are a harmonic tuple with M the middle between A,B. For M the Rs constant is replaced by the gravitational potential, known as the pair for the squared second and first cosmic speed of a mass system.

7c 257 and 347: above was 257 described by a polar angle 2, mass 5 and 7 can be used for inertial (relativistic) mass 57 in motion 3. Red shift of light can use 5 transferred into frequency by $mc^2 = hf$. In time 4 expansionof EMI energy, gravity due to mass subtract from f energy and by $\lambda f = c$ the EMI wave length λ increases length for a measurable redshift.

Conclusion

In the Emmy Noether Memorial Museum are models demonstrating the former MINT-Wigris theory. They are for color charges as an indpendent force as G-compass, the hedgehog for energy exchange of a nucleon or atom with its environment, a 6 roll mill for a quarkgluon flow inside a nucleons volume. Gluon exchanges between six quarks of deuteron, construction of barycentrical coodinates by the SI rotor, deuteron in a CP^2 space, models constructed from rolling paper strips having different bounding curves, two models for radius or c inverted energies inside a toroidal shaped boundary for dark matter or dark energy. Further models are available, for fusion the left figure in figure 6 shows two protons as tetrahedrons, having a common barycenter Z. Rotating them about Z generates deuteron with an upper neutron where the proton has emitted a positron and a neutrino [1-7].

Figure 5: Models.

Figure 6: Fusion.

The section on Fano memo triples introduces superpositions of these spin-like 3-dimensional space bases. They are responsible for many equations or energy properties. Gravity can be added to the other standard models forces, but not as a Lie algebra theory. Independent of the SU(3) QCD theory are introduced the color charges as force with the G-compass model in figure 5.

Bibliography

1. Kalmbach G. “Orthomodular Lattices”. London New York: Academic Press (1983): 390.
2. Kalmbach HE G. “MINT-Wigris”. MINT Verlag Bad Woerishofen (2019).
3. Kalmbach HE G. “Gravity with color charges”. *Journal of Emerging Trends in Engineering and applied Sciences* 11.5 (2020): 183-189.
4. Kalmbach HE G. “MINT (Mathematik, Informatik, Naturwissenschaften, Technik)”. Volume 1-65. Bad Wörishofen: MINT Verlag. 1997-2020.
5. T Poston and I Stewart. “Catastrophe theory and its applications”. Pitman, London. (1978).
6. K Stierstadt. Physik der Materie, VCH, Weinheim. (1989).
7. MINT-Wigris project (G. Kalmbach H.E.), in the internet under: researchgate.net.