

This theory is 0

Define0: numbers $1=1+0$ in $0=0X0$, $1=1X1$ as symbol $z=zz$ (algebraic definition of 0). Also

Postulate real number 0 if $z'=0$ and $z'=1$ plugged into $z'=z'z'+C$ (**eq.1**) results in some $C=0$ constant (ie $\delta C=0$).

so (using $\delta C=0$)

Plug $z'=0$ into eq.1 get 2D **Mandelbrot** set

So, $z_0=0$ into eq.1 iteration (plug left side into right side repeatedly) $z_{N+1}=z_N z_N + C$, (generates the larger numbers z_{N+1} so more *symbol* algebra so calculus definitions) requires we reject the C s for which $\delta C = \delta(z_{N+1} - z_N z_N) = \delta(\infty - \infty) \neq 0$. The C s that are left over define the **Mandelbrot set** implying a $\delta z \leq C_M = 10^{40N}$ X extremum perturbation fractal scale jumps

Plug $z'=1$ into eq.1 get 2D **Dirac** equation

So $z=1+\delta z$ into eq.1 gets $\delta z + \delta z \delta z = C$. (For $C < -1/4$ and $C > -1.40115 = C_M$ for Clifford algebra) then complex $\delta z = dr + i dt$ (=huge, $N=1$) into $\delta C = \delta(\delta z + \delta z \delta z) \approx \delta[(dr^2 - dt^2) + i(dr dt + dt dr)] = 0$ = Minkowski metric + Clifford algebra = **Dirac equation**. Also extremum $-1/4$ Mandelbrot set iteration becomes the rational Cauchy sequence $-1/4, -3/16, -55/256, \dots, 0$, implying **0** is *real*

Mandelbrot and **Dirac** together get 4D QM

Newpde $\equiv \gamma^\mu (\sqrt{\kappa_{\mu\nu}}) \partial \psi / \partial x_\mu = (\omega/c) \psi$ for e, ν , $\kappa_{00} = 1 - r_H/r = 1/\kappa_{rr}$, $r_H = C_M/\xi = e^2 X 10^{40N}/m$ ($N = -1, 0, 1, \dots$)
See davidmaker.com for backups

Spherical Harmonic Solutions to Newpde: $2P_{3/2}, 1S_{1/2}, 2S_{1/2}$ at $r=r_H$ Stable $2P_{3/2}$ at $r=r_H$

$N=0$ at $r=r_H$ $2P_{3/2}$ $3e$ baryons (QCD not required) Hund's rule $1S_{1/2}, \mu, 2S_{1/2}$ leptons (kioda)

4 SM Bosons from 4 axis extreme rotations of e, ν .

$N=-1$ (i.e., $e^2 X 10^{-40} = G m_p^2$) κ_{ij} is then by inspection the Schwarzschild metric g_{ij} So we just derived General Relativity (GR) and the gravity constant G from Quantum Mechanics (QM) in one line.

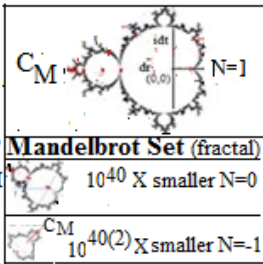
$N=1$ Newpde zitterwegung expansion stage is the cosmological expansion.

$N=1$ Zitterbewegung harmonic coordinates and Minkowski metric submanifold (after long time expansion) gets the DeSitter ambient metric we observe.

$N=0$ The third order Taylor expansion (terms) in $\sqrt{\kappa_{ij}}$ gives the anomalous gyromagnetic ratio and Lamb shift *without* the renormalization and infinities.

So $\kappa_{\mu\nu}$ provides the general covariance of the Newpde.

So we got all of physics here by mere inspection of this Newpde with no gauges!



Mandelbrot Set (fractal)

C_M 10^{40} X smaller $N=0$

C_M $10^{40(2)}$ X smaller $N=-1$

So get real# math and physics, *everything*. no more, no less.

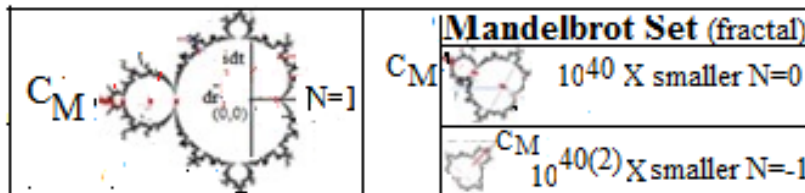
•**Conclusion:** So by merely (**plugging 0,1** into **eq.1**) **postulating 0**, out pops the whole universe, BOOM! easily the most important discovery ever made or that will ever be made again. We finally figured it out.

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Define 0: numbers $1 \equiv 1+0$ in $0 \equiv 0X0$, $1 \equiv 1X1$ as symbol $z=zz$ (algebraic definition of 0). Also
Postulate real number 0 if $z'=0$ and $z'=1$ plugged into $z'=z'z'+C$ (**eq.1**) results in |
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 (generates the larger numbers z_{N+1} so more *symbol* algebra so calculus definitions) requires
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 the **Mandelbrot set** implying a $\delta z \leq C_M = 10^{40N} X$ extremum perturbation fractal scale jumps



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 then complex $\delta z = dr + i dt$ (=huge $N=1$) into $\delta C = \delta(\delta z + \delta z \delta z) \approx \delta[(dr^2 - dt^2) + i(dr dt + dt dr)] = 0$
 = Minkowski metric + Clifford algebra = **Dirac equation**. Also extremum $-1/4$ Mandelbrot set
 Iteration becomes the rational Cauchy sequence $-1/4, -3/16, -55/256, \dots, 0$ implying **0** is *real*.

Mandelbrot and **Dirac** together get 4D QM

Newpde $\equiv \gamma^\mu (\sqrt{\kappa_{\mu\mu}}) \partial \psi / \partial x_\mu = (\omega/c) \psi$ for e, ν , $\kappa_{00} = 1 - r_H/r = 1/\kappa_{rr}$, $r_H = C_M/\xi = e^2 X 10^{40N}/m$ ($N = -1, 0, 1, \dots$)

Spherical Harmonic solutions to Newpde: $2P_{3/2}, 1S_{1/2}, 2S_{1/2}$ at $r=r_H$. stable state $2P_{3/2}$

$N=0$ at $r=r_H$, $2P_{3/2}$ 3e baryons (QCD not required) Hund's rule $1S_{1/2}, \mu; 2S_{1/2} \tau$; leptons (kioda)
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So get rel# math and physics, *everything*, no more, no less.

•**Conclusion:** So by merely (**plugging 0,1** into **eq.1**) **postulating 0**, out pops the whole universe,
 BOOM! easily the most important discovery ever made or that will ever be made again.

We finally figured it out.

PS. Note how smoothly and simply those 2 plugins (ie postulate 0) get the Mandelbrot set and
 Dirac eq *and* real# math. and how easily they then both yield the Newpde and so the universe.

Introduction All QM physicists know about *real* eigenvalue (Hermetian) observables (eg. eq.11 and its circles). All mathematicians know that the limit of a Cauchy sequence of rational numbers is a Cauchy real number (Cantor(7) 1872). So all we did here is show we postulated $real \neq 0$ by using it to derive a rational Cauchy sequence with limit 0 . We did this because that same postulate (of $real \neq 0$) math *also* implies *the* real eigenvalues and so fundamental theoretical physics (eg., the Newpde solutions below). So the Ultimate Occam's Razor postulate implies the ultimate math-physics theory. Nothing is more (real)'Occam' than postulate 0 .

Derivation of Newpde from postulate 0

This **Theory** is 0 . But we need to define the algebra first and use it to write the postulate 0 . So define

1) numbers $1 \equiv 1+0$ in $0 \equiv 0 \times 0, 1 \equiv 1 \times 1$ as symbol $z = zz$: (algebraic definition of 0). So we can write
 2) Postulate *real* number 0 if $z' = 0$ and $z' = 1$ plugged into $z' = z'z' + C$ (eq.1) results in some $C = 0$ constant (ie $\delta C = 0$).

So (using $\delta C = 0$)

• Plug in $z = 0 = z_0 = z'$ in eq.1. Note the equality sign in eq.1 demands we substitute z' on left (eq.1) into right $z'z'$ repeatedly and get iteration $z_{N+1} = z_N z_N + C$. So using that *other available* $C = 1$ $z_1 = 0 \times 0 + 1 = (0+1) \equiv 1$ so $z_2 = 1 \times 1 + 1 = (1+1) \equiv 2$ is now available etc., (both sums *defined* algebraically to be $(a+b) \equiv c$) and *define* rules of algebra (on these big numbers) like $a+b = b+a$ (eg., ring-field) with no new axioms. So postulate 0 also *generates* the big number algebra and calculus we can now use.

For example we can now define constant C with that $\delta C = 0$. When applied on iteration $z_{N+1} = z_N z_N + C, z_0 = 0$ it also requires we reject the C s for which $\delta C = \delta(z_{N+1} - z_N z_N) = \delta(\infty - \infty) \neq 0$. The C s that are left over define the fractal **Mandelbrot set** (6) with (D3) lemniscate (so eq.11 45° circle extremum of extreme observables) subsets $C_M = C = \delta z' = 10^{40N} \delta z, N = \text{integer}$ (since the derivation of eq.5 and thereby eq.11 requires we set the observer scale N anyway) also giving that required $C = 0 \in C_M$ ($C \approx 0$ from $z = 1 + \delta z'$ plugin is below.). See fig1 zoom(13). Thus these fractal scales have their own $\delta z'$ (tiny circles) that must perturb that $z = 1$ Nth scale putting ansatz $z = 1 + \delta z$ into eq.1 to get $\delta z + \delta z \delta z = C(3)$

Thus the (δz observables) numbers allowed are only in the Lemniscate Mandelbrot set subset.

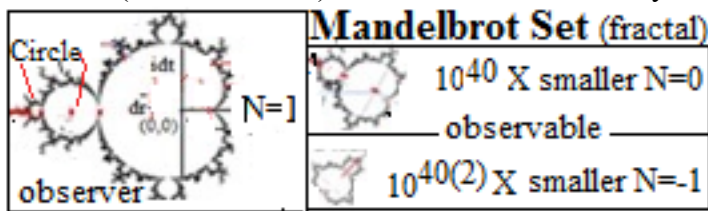


fig1 lemniscate subset(13). Defining the

'observers' (required by eq.11, so circle) scale as fractal scale N then $M < N$ (implied by eq.3) is the 'observables' scale M . For example we can define the fig1 'observer' fractal scales as $N=1$ implying $|\delta z| \gg 1$ since C is then huge in comparison to the $M=0$ scale. In addition to the above iteration, we must also solve eq 3 as a quadratic equation

$$\delta z = \frac{-1 \pm \sqrt{1 + 4C}}{2} \equiv dr + idt \text{ if } C < -1/4 \text{ (complex)} \quad (4)$$

(so also temporal observability eq.11 Hamiltonian observability with lower limit $-1.40115..$ Feigenbaum point C_M). Note the required Mandelbrot set iteration (ie., $z_{N+1} = z_N z_N - C$) for this $\delta C = 0$ extremum $C = -1/4$ is a rational number Cauchy sequence $-1/4, -3/16, -55/256, \dots, 0$ thereby

proving our above postulated *real#0* math. QED Note the < in eq.4 implies the actual real number is the N=0 limit $C \approx \delta z = dr$ is not at exactly 0.

•Plug in $z=1$ in $z'=1+\delta z$ in **eq1**, So $\delta C=0$ [eq1 implies eq3] $=\delta(\delta z+\delta z\delta z)=$
 $\delta\delta z(1)+\delta\delta z(\delta z)+(\delta z)\delta\delta z=$ (observer $|\delta z| \gg 1$ implying $M < N$) $\approx \delta(\delta z\delta z)=0$ =(plug in eq.4)
 $=\delta[(dr+idt)(dr+idt)] = \delta[(dr^2-dt^2)+i(drdt+dtdr)]=0$ (5)
 $=2D \delta[(\text{Minkowski metric, } c=1)+i(\text{Clifford algebra} \rightarrow \text{eq.7a})]$ (\equiv Dirac eq)

Factor **real** eq.5 $\delta(dr^2-dt^2)=\delta[(dr+dt)(dr-dt)] =0=[[\delta(dr+dt)](dr-dt)]+[(dr+dt)[\delta(dr-dt)]] =0$ (6)

so $-dr+dt=ds, -dr-dt=ds \equiv ds_1 (\rightarrow \pm e)$ Squaring & eq.5 gives circle in e, v (dr, dt) 2nd, 3rd quadrants (7)

& $dr+dt=ds, dr-dt=ds, dr+dt=0$, light cone $(\rightarrow v, \bar{v})$ in **same** (dr, dt) plane 1st, 4th quadrants (8)

& $dr+dt=0, dr-dt=0$ so $dr=dt=0$ defines vacuum (while eq.4 derives space-time) (9)

Those quadrants give *positive* scalar $drdt$ in eq.7 (if *not* vacuum) so imply the eq.5 *non* infinite extremum **imaginary** $\equiv drdt+dtdr=0 \equiv \gamma^i dr^j dt + \gamma^j dt^i dr = (\gamma^i \gamma^j + \gamma^j \gamma^i) drdt$ so $(\gamma^i \gamma^j + \gamma^j \gamma^i)=0, i \neq j$ (from **real** eq5 $\gamma^i \gamma^i=1$) (7a) Thus from eqs5,7a: $ds^2= dr^2-dt^2=(\gamma^r dr+i\gamma^t dt)^2$ Note how eq5 Dirac eq. and C_M Mandelbrot set just fall (pop) out of eq.1, amazing!

We square eqs.7 or 8 or 9 $ds_1^2=(dr+dt)(dr+dt)=(-dr-dt)(-dr-dt) = [dr^2+dt^2] + (drdt+dtdr) \equiv ds^2+ds_3=\text{Circle}+\text{invariant. Circle} \equiv \delta z = dse^{i\theta} = dse^{i(\Delta\theta+\theta_0)} = dse^{i((\cos\theta dr+\sin\theta dt)/(ds)+\theta_0)}$, $\theta_0=45^\circ$ min of $\delta ds^2=0$ given eq.7 constraint for $N=0$ $\delta z'$ perturbation of eq5 flat space implying a further $\delta C=0$ $(\partial C/\partial r)_t dr+i(\partial C/\partial t)_r dt=0$ Were $dt \approx 0$ and 45° allowed (so where also $dr \approx 0$ on $1/4 R$ sphere) is the Feigenbaum point. We define $k \equiv dr/ds, \omega \equiv dt/ds, \sin\theta \equiv r, \cos\theta \equiv t. dse^{i45^\circ} \equiv ds'$. Take ordinary derivative dr (since flat space) of 'Circle'.

$$\frac{\partial (dse^{i(\frac{rdr}{ds}+\frac{tdt}{ds})})}{\partial r} = i \frac{dr}{ds} \delta z \text{ so } \frac{\partial (dse^{i(\tau k + wt)})}{\partial r} = ik\delta z, k\delta z = -i \frac{\partial \delta z}{\partial r} . \quad (11)$$

Recall from above that we proved that dr is a real number. So $k = dr/ds$ is an operator with *real* eigenvalues (So k is an observable). Also $k=2\pi/\lambda$ (eg., in $\delta z = \cos kr$) thereby deriving the DeBroglie wavelength λ . Note the derivation of eq11 from that circle. Also from eq.11 we can write $\langle p_r \rangle^* = \int (p_r \psi)^* \psi d\tau = \int \psi^* p_r \psi d\tau = \langle p_r \rangle$. Therefore $p_r = \hbar k$ is Hermitian. given dr is real.

Our postulate 0 implies $z=zz+C \approx z=zz+0$ (if $z=1,0$ plugged into eq1) **so a small C**
 But for $N=0$ observable eq.3 $\delta z + \delta z\delta z = C$ reads $C \approx \delta z$. So that postulated small $C \approx 0$ implies an eq.5 (Minkowski metric) Lorentz contraction (9) $1/\gamma$ boosted frame of reference **small**

$$C \approx \delta z / \gamma = C_M / \xi = \delta z' \quad (12)$$

So take variation $\delta C = \delta C_M = (\delta \xi) \delta z + \xi \delta \delta z = 0 \quad (13)$

Given $z=1+\delta z$ for our above $z \approx 1$ (in our postulate plugin)
 δz in $\delta \xi \delta z$ is small (eg., in free space $\delta \delta z \approx 0$ and appendix A: $2S_{1/2}, \tau, ; 1S_{1/2}, \mu$) so in eq.13 $\delta \xi$ and ξ can be large (**unstable large mass** $\xi = \tau + \mu$) So. $\delta z' \approx C = C_M / \xi = C_M / (\tau + \mu) \quad (14)$

Given $z=1+\delta z$ for our above $z \approx 0$
 Given $|\delta z|$ in $\delta \xi \delta z$ is large ($\delta z = -1$ eg., for $2P_{3/2}$ at $r=r_H$) so $\delta \xi$ and ξ can be small (**stable small mass: electron** $\xi_0 = m_e$ ground state δz so $\delta z' \approx C = C_M / \xi_0 = C_M / m_e \quad (15)$

for internal $r \approx r_H$ comoving $2P_{3/2}$ at $r=r_H$ ultrarelativistic observer. For external observer then $2m_e \rightarrow \xi = m_p$ so C is still small.

$C_M = e^2 10^{40N}$ fractal for $N=0$ defines charge $e. \xi$ defines mass.

$\delta z'$ perturbs eq.7 δz In complex plane $\delta z' + \delta z = (dx_1 + idx_2) + (dx_3 + idx_4) \equiv dr + idt$
 For the $N=1$ huge observer $\delta z \gg \delta z\delta z$ from eq.3. Thus the required $N=-1, N=0$ tiny observable $(C_M/\xi = \delta z' \ll \delta z)$ is a perturbation of the eq.7 $\delta z \approx dr \approx dt$ at 45° $(dr - \delta z') + (dt + \delta z') \equiv dr' + dt' = ds \quad (16)$
 But for the high energy big $\delta \delta z$ (see eq.22 and extreme "axis" perturbations) δz is small. So

finding big $\delta\delta z$ ‘observables’ requires we artificially stay on the circle (appendix C) implying this additional $\delta z'$ eq7 perturbation.

Define $\kappa_r \equiv (dr/dr')^2 = (dr/(dr-\delta z'))^2 = 1/(1-r_H/r)^2 = A_1/(1-r_H/r) + A_2/(1-r_H/r)^2$ (RN)

The partial fractions A_I can be split off from RN and so $\kappa_r \approx 1/[1-r_H/r]$. (17)

$$\text{in } ds^2 = \kappa_r dr'^2 + \kappa_{00} dt'^2 \quad (18)$$

From eq.7a $dr' dt' = \sqrt{\kappa_r} dr' \sqrt{\kappa_{00}} dt' = dr dt$ so

$$\kappa_r = 1/\kappa_{00} \quad (19)$$

•Both $\underline{z=0, z=1}$ together (in eq1. Use 3D orthogonality to get (2D+2Dcurved space)). Thus

$\delta z' + \delta z = (dx_1 + idx_2) + (dx_3 + idx_4) = dr + idt$ given $dr^2 - dt^2 = (\gamma^r dr + i\gamma^t dt)^2$ if $dr^2 = dx^2 + dy^2 + dz^2$ (3D

orthogonality) so that $\gamma^r dr = \gamma^x dx + \gamma^y dy + \gamma^z dz$, $\gamma^i \gamma^j + \gamma^j \gamma^i = 0$, $i \neq j$, $(\gamma^i)^2 = 1$. From eq.14

$(\gamma^x \sqrt{\kappa_{xx}} dx + \gamma^y \sqrt{\kappa_{yy}} dy + \gamma^z \sqrt{\kappa_{zz}} dz + \gamma^t \sqrt{\kappa_{tt}} dt)^2 = \kappa_{xx} dx^2 + \kappa_{yy} dy^2 + \kappa_{zz} dz^2 - \kappa_{tt} dt^2 = ds^2$. Multiply both sides by \hbar^2/ds^2 and $\delta z^2 = \psi^2$ use eq11 inside brackets () get 4D QM

Newpde $\equiv \gamma^\mu (\sqrt{\kappa_{\mu\mu}}) \partial \psi / \partial x_\mu = (\omega/c) \psi$ for e, ν , $\kappa_{00} = 1 - r_H/r = 1/\kappa_r$, $r_H = C_M/\xi = e^2 \times 10^{40N}/m$ ($N = -1, 0, 1, \dots$)

Postulate(0) \rightarrow Newpde

Appendix A object A Solution to **Newpde** Half Integer Spherical Harmonics

2P_{3/2} at $r=r_H$ implying 2S_{1/2}, 1S_{1/2}

stable 2P_{3/2} at $r=r_H$

$\gamma^\mu (\sqrt{\kappa_{\mu\mu}}) \partial \psi / \partial x_\mu = (\omega/c) \psi$ for e, ν , $\kappa_{00} = 1 - r_H/r = 1/\kappa_r$, $r_H = C_M/\xi = e^2 \times 10^{40N}/m$ ($N = -1, 0, 1, \dots$) (20)

Newpde Separation of Variables (12) gives **Half Integer Spherical Harmonics**

2P_{3/2} at $r=r_H$ implying 2S_{1/2}, 1S_{1/2}

2P_{3/2} at $r=r_H$ state. $N=0$

At $r=r_H$. we have *stability* ($dt'^2 = \kappa_{00} dt^2 = (1-r_H/r) dt^2 = 0$) since the dt' clocks stop at $r=r_H$. After a possible positron (central) electron annihilation that 2 γ ray scattering off the 3rd mass (in 2P_{3/2}) the diagonal metric (eq.17) time reversal invariance is a reverse of the γ ray pair annihilation with the subsequent e^\pm pair creation inside the r_H volume given $\sigma = \pi r_H^2 \approx (1/20)$ barn making it merely a virtual creation-annihilation event. So our 2P_{3/2} composite 3e (proton = $P=D/2$) at $r=r_H$ is the *only* stable multi e composite. Also see PartII davidmaker.com

Comparison with QCD

The electron (solution to that new pde) spends 1/3 of its time in each 2P_{3/2} (at $r=r_H$) trifolium lobe, *explaining the lobe multiples of 1/3e fractional charge* (So these ‘lobes’ can be named ‘quarks’ or George if you want). The lobes are locked into the center of mass, can’t leave, *giving asymptotic freedom* (otherwise yet another ad hoc postulate of qcd). As derived in PartII the two positrons must be ultrarelativistic (due to interior B flux quantization, so $\gamma=917$: sect.7.5, $3e = (\gamma m_e + \gamma m_e) = m_p$) at $r=r_H$ so the field line separation is narrowed into plates at the central electron explaining the strong force (otherwise postulated by qcd). Also there are 6 2P states *explaining the 6 quark flavors*. P wave scattering *gives the jets*. Thus we derived all the properties of quarks from the Newpde 2P_{3/2} state at $r=r_H$. So protons are just 2 Newpde positrons and electron in 2P_{3/2} at $r=r_H$ states. Quarks can be forgotten.

1S_{1/2} 2S_{1/2} at $r \leq r_H$ Hund rule States

Recall from just above:

$$(\gamma^x \sqrt{\kappa_{xx}} dx + \gamma^y \sqrt{\kappa_{yy}} dy + \gamma^z \sqrt{\kappa_{zz}} dz + \gamma^t \sqrt{\kappa_{tt}} dt)^2 = \kappa_{xx} dx^2 + \kappa_{yy} dy^2 + \kappa_{zz} dz^2 - \kappa_{tt} dt^2 = ds^2. \quad (21)$$

Schrodinger equation for Newpde for these 1S_{1/2} μ , 2S_{1/2} ϵ at $r \leq r_H$ States

Here the Schrodinger equation is the nonrelativistic limit of the Newpde (modified Dirac) equation.

1) Recall associated 2 body *energy eigenvalues of Newpde Schrodinger equation* hydrogen atom $r > r_H$ Rydberg formula

$$E = R_b / N^2 \quad N = \text{principle quantum number}$$

2) The resulting *energy eigenvalues of the Newpde Schrodinger eq.* at $r = r_H$ is given by the Kioda formula: $\frac{Nm_\tau + Nm_\mu + Nm_e}{(\sqrt{Nm_\tau} + \sqrt{Nm_\mu} + \sqrt{Nm_e})^2} = \frac{2}{3}$ $N = \text{principle quantum number}$

Nonrelativistic reduced COM $r > r_H$ observer model for $2P = D$

Also recall Schrodinger equation (so nonrelativistic): $H\psi = -\frac{\hbar}{2m} \frac{\partial^2}{\partial r^2} \psi$, $P\psi = -\frac{\hbar}{2P} \frac{\partial^2}{\partial r^2} \psi = -\frac{\hbar}{D} \frac{\partial^2}{\partial r^2} \psi$ So $\delta\delta z = -i\delta_i \delta z$ is then energy $X\delta z$ (22)

Thus eq. 11 $\hbar(d\psi/ds) = -i\hbar d\psi/dr$ with \hbar canceling out:

$$k\psi = -\frac{1}{2m} \frac{\partial^2}{\partial r^2} \psi \quad (k = dr/ds) = -\frac{1}{2m} \left(\frac{dr}{ds}\right)^2 \psi = \left(\sqrt{\frac{1}{2m}} \frac{dr}{ds}\right)^2 \psi$$

This D is $2X$ proton mass singlet here. Recall also (above) that the linear dx_i s perturbations *add* in the complex plane (Recall from above $\delta z' + \delta z$ so could be NX also) so the Dirac equation for lepton multiplets G, $1S_{1/2}$, $2S_{1/2}$ can be summed under the square (brackets) in eq. 21

$$3k\psi = \left(\sum_1^3 \sqrt{\frac{1}{2m}} \frac{dr}{ds}\right)^2 \psi$$

So all the relativistic effects are thrown into the $P = m$ mass black box allowing us to still use the exact nonrelativistic Schrodinger equation outside r_H for the COM proton P. Recall from the above Schrodinger equation that 2 positron principle quantum number ($N = 1$) mass energy = $m = (m_\tau + m_\mu + m_e) / 2 = \text{proton} = (2P) / 2 = D / 2$ reduced mass of the two positron motion so

$$\frac{D}{2} 3\psi = P 3\psi = \left(\sqrt{\frac{1}{2m_\tau}} \frac{dr'}{ds} + \sqrt{\frac{1}{2m_\mu}} \frac{dr'}{ds} + \sqrt{\frac{1}{2m_e}} \frac{dr'}{ds}\right)^2 \psi \quad \text{stable solution: Newpde } 2P_{3/2} \text{ state at}$$

$r = r_H$.

Replace black box mass D with its interior ultrarelativistic values

But from eq. 21 (and note τ, μ, e are Dirac equation-Newpde particles so) we can define the black box eq. 21 mass relativistic part: $\gamma^r \sqrt{\kappa_{rr}} dr \equiv dr'$. Use $\gamma^r \gamma^r = 1$ so that

$$\frac{D}{2} 3\psi = \frac{(m_\tau + m_\mu + m_e)}{2} 3\psi = \left(\frac{\gamma^r}{1} \sqrt{\frac{\kappa_{r\tau\tau}}{D_\tau/2}} \frac{dr}{ds} + \frac{\gamma^r}{1} \sqrt{\frac{\kappa_{r\mu\mu}}{D_\mu/2}} \frac{dr}{ds} + \frac{\gamma^r}{1} \sqrt{\frac{\kappa_{rre}}{D_e/2}} \frac{dr}{ds}\right)^2 \psi$$

Given the black box interior positron ultrarelativistic (so at 45° : $\sqrt{2} dr = ds$), $\kappa_{rr} = m^2$ (B10) for 0 relative speed COM motion inside r_H :

$$3 \frac{(m_\tau + m_\mu + m_e)}{2} = \left(\frac{\gamma^r}{1} \sqrt{\frac{\kappa_{r\tau\tau}}{m_\tau/2}} \frac{dr}{\sqrt{2} dr} + \frac{\gamma^r}{1} \sqrt{\frac{\kappa_{r\mu\mu}}{m_\mu/2}} \frac{dr}{\sqrt{2} dr} + \frac{\gamma^r}{1} \sqrt{\frac{\kappa_{rre}}{m_e/2}} \frac{dr}{\sqrt{2} dr}\right)^2$$

so that (again B10 implies $\sqrt{\kappa_{rr}} = m$ nonrelativistically):

$$3(m_\tau + m_\mu + m_e) = 2(\sqrt{m_\tau} + \sqrt{m_\mu} + \sqrt{m_e})^2 \quad \text{so}$$

$$\frac{Nm_\tau + Nm_\mu + Nm_e}{(\sqrt{Nm_\tau} + \sqrt{Nm_\mu} + \sqrt{Nm_e})^2} = \frac{2}{3} \quad N = \text{principle quantum number}$$

Kiode

Ratios of the real valued masses that solve Kiode are $m_\tau/m_\mu/m_e = 1/.05946/.0002826$
 $=1777\text{Mev}/105.6\text{Mev}/.511\text{Mev}$ (A1)

good to at least 4 significant figures. A triple header with all three lepton masses $1S_{1/2} 2S_{1/2}$ at $r \leq r_H$ and also the proton as two positron mass $= (m_\tau + m_\mu + m_e)/2 = \text{Proton}$: *the* real eigenvalues.

$\delta C=0$ upper and lower limit

Upper limit with finite dt (so with Hamiltonian, eq.11 observability) is again $C = -1/4$. Lower limit is -1.40115 . Feigenbaum pt. In that regard recall <http://www.youtube.com/watch?v=0jGaio87u3A> which explores the Mandelbrot set interior near the Feigenbaum point. Since this much smaller object is exactly selfsimilar to the first at this point inside the Lemniscate we can reset the zoom start at such extremum $S_N C_M = 10^{40N} C_M$ in D3. eq.20 In any case the splits are in 3 directions from the orbs. There appear to be about 2.5 splits going by each second (given my PC baud rate) and the next Mandelbrot set comes up in about 62 seconds. So $3^{2.7 \times 62} = 10^N$ so $172 \log 3 = N = 82$. So there are 10^{82} splits. So there are about 10^{82} splits per initial split. But each of these Mandelbrot set Feigenbaum points is a $C_M/\xi \equiv r_H$ in electron (eq.10 above). So for each larger electron there are **10^{82} constituent electrons**. Also the scale difference between Mandelbrot sets as seen in the zoom is about **10^{40} , the scale change** between the classical electron radius and 10^{11} ly with the C noising giving us our fractal universe.

Recall again we got from eq.3 $\delta z + \delta z \delta z = C$ with quadratic equation result:

$\delta z = \frac{-1 \pm \sqrt{1-4C}}{2}$. is real for noise $C < 1/4$ creating our noise on the $N=0$ th fractal scale. So $1/4 = (3/2)kT/(m_p c^2)$. So T is 20MK. So here we have *derived the average temperature of the universe* (stellar average). That $z' = 1 + \delta z$ substitution also introduces Lorentz transformation rotational and translation noise that does not effect the number of splits, analogous to how a homeomorphism does not change the number of holes (which is a Topological invariant). So the excess C noise (due to that small C' boost) causes the Feigenbaum point neighborhood internal structure to become randomized (as our present universe is) but the number of electrons (10^{82}) remains invariant. See appendix D mixed state case2 for further organizational effects. $N = r^D$. So the **fractal dimension** $= D = \log N / \log r = \log(\text{splits}) / \log(\#r_H \text{ in scale jump})$
 $= \log 10^{80} / \log 10^{40} = \log(10^{40})^2 / \log(10^{40}) = 2$. (See appendix E for Hausdorff dimension & measure) which is the same as the 2D of eq.4 and the Mandelbrot set. The next smaller (subatomic) fractal scale $r_1 = r_H = 2e^2/m_e c^2$, $N=0$ th, $r_2 = r_H = 2GM/c^2$ is defined as the $N=1$ th where $M = 10^{82} m_e$ with $r_2 = 10^{40} r_1$ So the Feigenbaum pt. gave us a lot of physics:
eg. **#of electrons in the universe, the universe size, temp.** With 10^{82} electrons between any two fractal scales we are also *certainly allowed objects B&C* in the Newpde $2P_{2/3}$ state at $r = r_H$.

Intuitive Notion (of postulate 0 ↔ Newpde + Copenhagen stuff)

The Mandelbrot set introduces that $r_H = C_M / \xi_1$ horizon in $\kappa_{00} = 1 - r_H/r$ in the Newpde, where C_M is fractal by $10^{40} \times$ scale change (fig.2). So we have found (davidmaker.com) that: Given that fractal self-similarity, astronomers are observing from the inside of what particle physicists are studying from the outside, that **ONE New pde e** electron r_H , **one** thing (fig.1). *Everything* we observe big (cosmological) and small (subatomic) is then that (*New pde*) r_H , even baryons are composite $3e$. So we understand, *everything*. This is the only Occam's razor first principles theory.

Summary: So instead of doing the usual powers of 10 simulation we do a single power of 10^{40} simulation and we are immediately back to where we started!

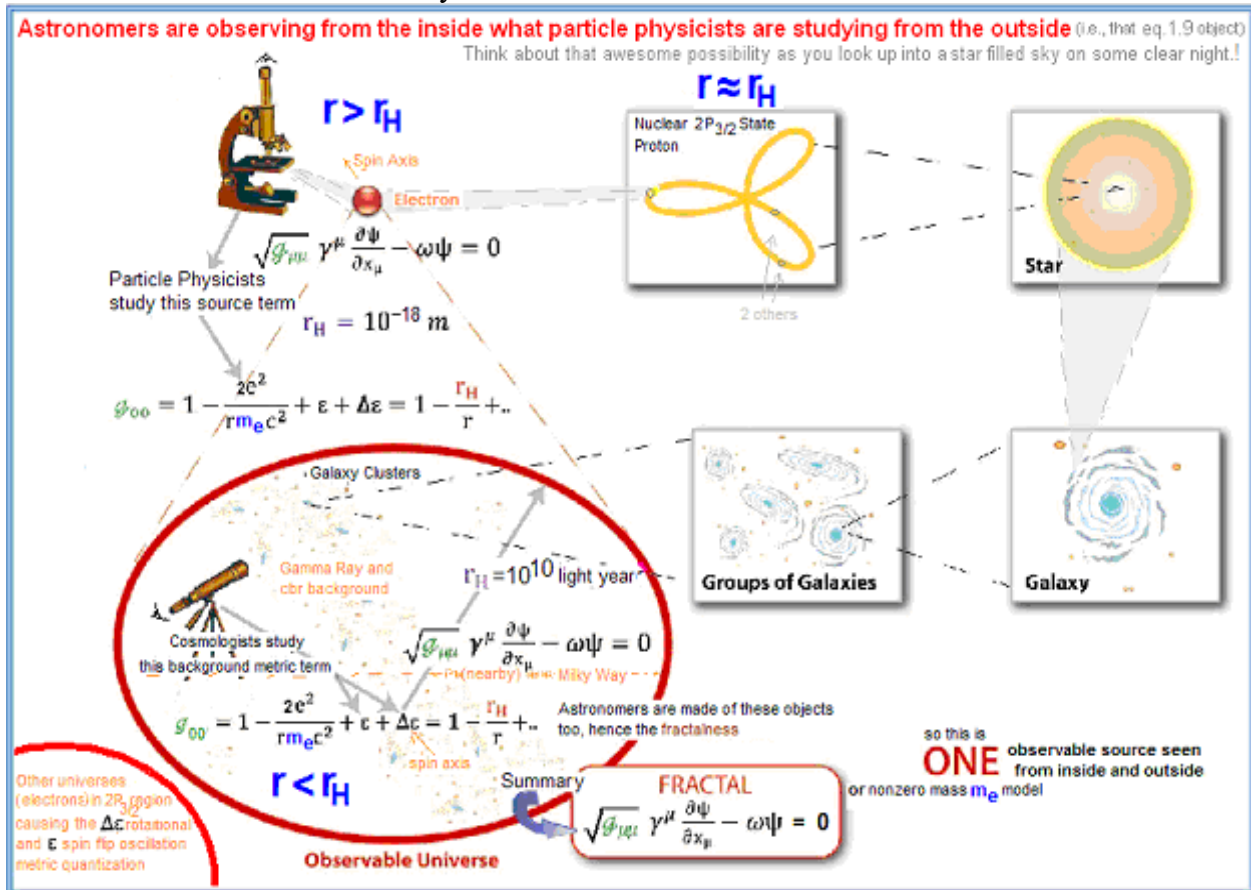


fig2.

(↑ lowest left corner) Object C $g_{00} = \kappa_{00}$ caused caused metric quantization jumps: Reyleigh Taylor → galaxy → globular → protostar nebula, etc. $\times 100$ scale change metric quantization jumps (Part III)

This theory is 0

Define0: numbers $1=1+0$ in $0=0X0$, $1=1X1$ as symbol $z=zz$ (algebraic definition of 0). Also

Postulate real number 0 if $z'=0$ and $z'=1$ plugged into $z'=z'z'+C$ (eq.1) results in some $C=0$ constant (ie $\delta C=0$).

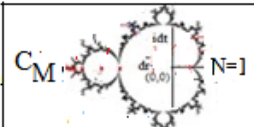
.so

Plug $z'=0$ into eq.1 get 2D **Mandelbrot** set iteration and rel0 (with 10^{40N} X fractal scaling, $N=integer$)

Plug $z'=1$ into eq.1 get 2D **Dirac** equation (Pluggin gives Minkowski metric and Clifford algebra so Dirac eq.)

Mandelbrot and **Dirac** together get 4D QM

Newpde $\equiv \gamma^\mu (\sqrt{\kappa_{\mu\mu}}) \partial\psi/\partial x_\mu = (\omega/c) \psi$ for e, ν , $\kappa_{00}=1-r_H/r = 1/\kappa_{rr}$, $r_H=C_M/\xi=e^2 X 10^{40N}/m$ ($N=. -1, 0, 1..$)

Spherical Harmonic Solutions to Newpde: $2P_{3/2}, 1S_{1/2}, 2S_{1/2}$ at $r=r_H$ Stable $2P_{3/2}$ at $r=r_H$	
<p>$N=0$ at $r=r_H$ $2P_{3/2}$ $3e$ baryons (QCD not required) Hund's rule $1S_{1/2}, 2S_{1/2}$ leptons (kioda)</p> <p>4 SM Bosons from 4 axis extreme rotations of e, ν.</p> <p>$N=-1$ (i.e., $e^2 X 10^{-40} \equiv Gm_e^2$) κ_{ij} is then by inspection the Schwarzschild metric g_{ij} So we just derived General Relativity (GR) and the gravity constant G from Quantum Mechanics (QM) in one line.</p> <p>$N=1$ Newpde zitterwegung expansion stage explains the universe expansion.</p> <p>$N=1$ Zitterbewegung harmonic coordinates and Minkowski metric submanifold (after long time expansion) gets the DeSitter ambient metric we observe.</p> <p>$N=0$ The third order Taylor expansion (terms) in $\sqrt{\kappa_{ij}}$ gives the anomalous gyromagnetic ratio and Lamb shift <i>without</i> the renormalization and infinities.</p> <p>So κ_{ij} provides the general covariance of the Newpde.</p> <p>So we got all of physics here by <i>mere inspection</i> of this Newpde with no gauges!</p>	
	<p>Mandelbrot Set (fractal)</p> <p>C_M 10^{40} X smaller $N=0$</p> <p>C_M $10^{40(2)}$ X smaller $N=-1$</p>

•**Conclusion:** So by merely (plugging 0,1 into eq.1) postulating 0, out pops the whole universe, BOOM! easily the most important discovery ever made or that will ever be made again. We finally figured it out.

References

- (6) Penrose in a utube video implied that the Mandelbrot set might contain physics. Here we merely showed how to find it. For example the (fractal Mandelbulb neighborhood area $|drdt| > 0$ of the) Feigenbaum point is a subset (containing that 10^{40} X selfsimiilar scale jump: Fig1)
- (7) Cantor: Ueber die Ausdehnung eines Satzes aus der Theorie der trigonometrischen Reihen, "Ueber eine elementare Frage der Mannigfaltigkeitslehre" Jahresbericht der Deutschen Mathematiker-Vereinigung.". Cantor proved the real# were dense with a binary # (1,0) argument (Our $z=zz$ solutions also implying 11c and appendix F). Thus we capture all the core real# properties with postulate0
- (8) Tensor Analysis, Sokolnikoff, John Wiley
- (9) The Principle of Relativity, A Einstein, Dover
- (10) Quantum Mechanics, Merzbacher, John Wiley
- (11) lemniscate circle sequence (Wolfram, Weisstein, Eric)
- (12) Quantum Mechanics, Merzbacher 2nd edition pp.605-607
- (13) <http://www.youtube.com/watch?v=0jGai087u3A>

Fractal Scales N in eq.20 Newpde

N=1 observer (eq.17,18,19 gives our Newpde metric $\kappa_{\mu\nu}$ at $r < r_H, r > r_H$)

Found General Relativity (GR) GR from eq.17- eq.19 so Schwarchild metric and so can do a dyadic coordinate transformation on it to get the Kerr metric and all these free space metrics to get all the solutions to $R_{ij}=0$. so generate the Ricci tensor.

N=-1, $e^2 10^{40(-1)} = e^2 / 10^{40} = Gm_e^2$, solve for G, get GR. So we can now write the Ricci tensor $R_{\mu\nu}$ (and fractally self similar perturbation Kerr metric since frame dragging decreased by external object B, sect.B2). Also for fractal scale $N=0$, $r_H = 2e^2 / m_e c^2$, and for $N=-1$ $r'_H = 2Gm_e / c^2 = 10^{-40} r_H$.

D=5 if using N=-1, and N=0, N=1 contributions in same $R_{ij}=0$

Note the $N=-1$ (GR) is yet another δz perturbation of $N=0$ $\delta z'$ perturbation of $N=1$ observer thereby adding, if these scales share the same time coordinate, at least 1 independent parameter tiny (wrapped up) dimension added to our $\delta z + (dx_1 + idx_2) + (dx_3 + idx_4)$ (4+1) *explaining why Kaluza Klein 5D $R_{ij}=0$ works so well*: GR is really 5D if $N=0$ E&M included with $N=-1$.

Object A Fractal mass and N=1 (is) cosmology

From Newpde (eg., eq.1.13 Bjorken and Drell special case) $i\hbar \frac{\partial \psi}{\partial t} = \frac{\hbar c}{i} \left(\alpha_1 \frac{\partial \psi}{\partial x^1} + \alpha_2 \frac{\partial \psi}{\partial x^2} + \alpha_3 \frac{\partial \psi}{\partial x^3} \right) + \beta m c^2 \psi = H \psi$. For electron at rest: $i\hbar \frac{\partial \psi}{\partial t} = \beta m c^2 \psi$ so: $\delta z = \psi_r = w^r(0) e^{-i\varepsilon_r \frac{m c^2}{\hbar} t}$
 $\varepsilon_r = +1, r=1,2; \varepsilon_r = -1, r=3,4$): This implies an oscillation frequency of $\omega = m c^2 / \hbar$. which is fractal here ($\omega = \omega_0 10^{-40N}$). So the eq.16 the 45° line has this ω oscillation as a (that eq.7-9 δz variation) rotation at radius ds. On our own fractal cosmological scale $N=1$ we are in the expansion stage of one such oscillation. Thus the fractalness of the Newpde explains cosmology. The next higher cosmological scale is independent (but still connected by relativistic superposition of speeds implying an inverse separation of variables result: $i\hbar \frac{\partial \psi}{\partial t} = \beta \sum_N (10^{-40N} (\omega t)_{\varepsilon + \Delta \varepsilon}) \psi = \beta \sum_N (10^{-40N} m_{\varepsilon + \Delta \varepsilon} c^2 / \hbar) \psi$). For time spans smaller than the expansion time of the universe we can set $m_\tau = 1$. So from Kiode at this time (relative to the tauon) the muon $= \varepsilon = .05946$, electron $\Delta \varepsilon = .0005899 / 2 = .0002826$. (A1)

Given this ω , $\alpha \varepsilon$. getting larger with time (See Mercuron equation) B3a. Set average $e^{(-\varepsilon + \Delta \varepsilon) 2} = \delta |e^{i\tau tz}|$ Newpde zitterbewegung oscillation but τ constant (fig6), doesn't vary in cosmological time t_c . So cosmologically (eq. B11) outside r_H of object B for $N=0$ use tz . For $N=1$ use t_c for cosmologically relevant time dependence.

Define average $(e^{i(\tau + \varepsilon + \Delta \varepsilon) tz}) \equiv \delta \bar{z}_0$, So $|\delta z| = |e^{-i\varepsilon_r \frac{m c^2}{\hbar} t} \delta \bar{z}_0| = \delta \bar{z}_0 e^{i\omega t} = e^{i(\tau + \varepsilon + \Delta \varepsilon) tz + i(-\varepsilon + \Delta \varepsilon) t c} = \delta \hat{z}_0 e^{i(\varepsilon + \Delta \varepsilon) t} = \delta \hat{z}_0 \sqrt{\kappa_{rr}}$ in $(\sqrt{\kappa_{rr}} = e^{i(\varepsilon + \Delta \varepsilon) t})$ $dr^2 = \kappa_{rr} dr^2 = e^C \kappa_{00} dr^2 = e^{i(-\varepsilon + \Delta \varepsilon) 2} \kappa_{00} dr^2$ (A2)

But seen from inside at $N=1$ $E = 1 / \sqrt{\kappa_{00}} = 1 / \sqrt{(1 - r_H / r)}$ (B20) then $r < r_H$ & E becomes imaginary in $e^{iEt/\hbar} = \delta z = \sqrt{\kappa_{00}} dt = e^{-i\varepsilon_r \frac{m c^2}{\hbar} t} dt \rightarrow e^{(-\varepsilon + \Delta \varepsilon) t}$ (A2)

The negative sign from equation B2a below. The reduced mass ground state rotater ($\Delta \varepsilon$) for ε for this κ_{00} part of derivation). This $e^{i2\Delta \varepsilon / (1 - 2\varepsilon)} = \kappa_{00}$ asymptotic value must be equal to g_{00} in galaxy halos in the plane of the galaxy (sect.11.4). Ricci tensor is given by oscillating source.

'Observer' scale $N > M$ 'observables' scale.

Recall from sect.1 if our scale $N > M$ for some object then N is the observer scale and M is the 'observable' scale. Note the scale difference can be very small. Since we are all electrons that means a slightly smaller scale electron is the observable. But this seems to eliminate astronomy

as observation of ‘observables’ since those objects exist at a *larger* scale $N=1$. But not to the $N=2$ scale (the ‘gid’ scale as I call it) since to him($N=2$) the $N=1$ astronomy scale is an ‘observable’ scale since $N=2 > N=1$.

A2 Two perturbations of the $N=1$ scale as seen by $N=2$

We also have two perturbations of the $N=1$ scale here. The first perturbation is due to the Dirac equation object A zitterbewegung harmonic oscillation (which equivalently could be the source or the manifold). Recall in that regard Weinberg(eg., eq 10.1.9 “Gravitation & Cosmology”) calls it a “harmonic coordinate system”(here as eq.1.13 Bjorken and Drell) thereby also providing our manifold in that 2nd case. The second much smaller perturbation is due to the drop in inertial frame dragging due to nearby object B.(So 3 objects in this $N=1$ $2P_{3/2}$ $3e$ cosmological proton A,B,C.). Appendix C derives the effects of object C.

Ricci tensor source term for interior to object A

In that regard the Ricci tensor $= R_{ij} = -(1/2)\Delta(g_{ij})$ (where Δ is the Laplace-Beltrami second derivative operator) is not zero and the right side is the metric source. Recall limit R_{ij} as $r \rightarrow 0$ is the source, where alternatively gravity creates gravity feedback loop in the Einstein equations which becomes the modulation of the DeSitter ball implied by the zitterbewegung oscillation of object A. Geometrically, the Ricci curvature is the mathematical object that controls the (comoving *observer*) *growth rate of the volume* of metric balls in a manifold in this case given by the New pde source zitterbewegung. Thus the above Laplace Beltrami source eq. A2 $-\sin\omega t \equiv -\sin\mu \approx -\sin\epsilon$ here comes out of the Newpde zitterbewegung A2.

$N=2$ ‘observer’ sees what we see if $i \rightarrow 1$ in $\sin\mu \rightarrow \sinh\mu$ in $R_{22} = -\sinh\mu$: which makes our $N=1$ ‘observables’.

But $R_{22} = e^{-\lambda} [1 + \frac{1}{2} r(\mu' - \nu')] - 1$ with $\mu = \nu$ (spherical symmetry) and $\mu' = -\nu'$. So as $r \rightarrow 0$, $\text{Im}R_{22} = \text{Im}(e^\mu - 1) = \mu + \dots = \sin\mu = \mu + \dots$ for outside r_H imaginary μ for small r (at the source) so zitterbewegung $\sin\mu$ becomes a gravitational source (alternatively gravity itself can create gravity in a feedback mechanism). The $N=2$ observer then multiplies by i iR_{22} , $-i\sin\mu$ and μ to get $R_{22} = -\sinh\mu$ (A2A)

to see what the $N=2$ observer sees that we see inside r_H so:

$R_{22} = e^{-\nu} [1 + \frac{1}{2} r(\mu' - \nu')] - 1 = -\sinh\nu = -(e^\nu - e^{-\nu})/2$, $\nu' = -\mu'$ so $(e^\mu - 1) = -\sinh\mu$ for positive μ in $\sinh\mu$ then the $\mu = \epsilon$ in the e^μ on the left is negative (A2B).

Object B mostly contributes to μ' in $-r\mu\omega$, with object C providing a tiny perturbation of μ' , implying there is no such positive $\sinh\mu$ constraint for object C. Thus the object C *perturbation* μ_c in e^{μ_c} coefficient can be positive or negative

$e^{-\mu} [-r(\mu')] = -\sinh\mu - e^{-\mu} + 1 = (-(-e^{-\mu} + e^\mu)/2) - e^{-\mu} + 1 = -(e^{-\mu} + e^\mu)/2 + 1 = -\cosh\mu + 1$. So given $\nu' = -\mu'$ $e^{-\nu} [-r(\mu')] = 1 - \cosh\mu$. Thus $e^{-\mu} r(d\mu/dr) = 1 - \cosh\mu$

This can be rewritten as: $e^\mu d\mu / (1 - \cosh\mu) = dr/r$

We set the phase μ so that when $t=0$ then $r=0$ so use $r = \sin\omega t$ in eq.A1. Given the fractal universe a temporarily comoving proper frame at minimum radius lowest γ must imply a μ Mandelbulb chord 45° intersection that implies minimally the Newpde ground state (Which can't go away analogously as for a hydrogen atom orbital electron.) $\Delta\epsilon$ electron for comoving outside observer where then at time=0, in B1,B2 $\tau - \epsilon \approx \omega t = \Delta\epsilon \approx 1 - 1 = 0$ so that $\omega t = \Delta\epsilon$ when $\sin\omega t \approx 0$. So the

integration of B3 is from $\xi_1 = \mu = \varepsilon = 1$ to the present day mass of the $\mu = m_{\mu} = 0.5946$ (X tauon mass) giving us: $\ln(r_{M+1}/r_{bb}) + 2 = [1/(e^\mu - 1) - \ln[e^\mu - 1]]/2$ (A3C) implying $g_r = e/2me(1+\mu)$ gyromagnetic ratio ($\mu = m$) is changing with time as was discovered recently at Fermi lab 2023 (Ch.7) with CERN 1974 gr muon data for comparison.

A2 Writing The feedback mechanism two different ways

Introduction to $\Delta\varepsilon$ contribution to what N=2 sees

We have two perturbations, one due to the zitterbewegung and a smaller one due to the drop in inertial frame dragging due to nearby object B.

So inside object A we can include the zitterbewegung oscillation $\delta z = \sqrt{\kappa_{00}} dt = e^{-i\varepsilon r \frac{mc^2}{\hbar} t} dt \rightarrow e^{(-\varepsilon + \Delta\varepsilon)^2 dt}$ in the source as $-\sinh\mu = R_{22}$

Alternatively zitterbewegung oscillation $\delta z = \sqrt{\kappa_{00}} dt = e^{-i\varepsilon r \frac{mc^2}{\hbar} t} dt \rightarrow e^{(-\varepsilon + \Delta\varepsilon)^2 dt}$, with $r \rightarrow \infty$, $g_{\alpha\alpha} \rightarrow \text{constant} \neq 1$, can be the manifold itself, so relative to this manifold the motion is flat space so sourceless. Thereby we set $R_{22} = -\sinh\mu = 0$ with $R_{\alpha\alpha} = 0$.

So these 2 perturbations then give the N=1 contribution to what N=2 sees.

N=2 sees local interior contribution of object A

Object B N=1 ambient metric C=constant (nonrotating)

From eqs 17-19 but with ambient metric ansatz: $ds^2 = -e^\lambda (dr)^2 - r^2 d\theta^2 - r^2 \sin^2\theta d\phi^2 + e^\mu dt^2$ (A3)

so that $g_{00} = e^\mu$, $g_{rr} = e^\lambda$. From eq. $R_{ij} = 0$ for spherical symmetry in free space and N=0

$$R_{11} = \frac{1}{2}\mu'' - \frac{1}{4}\lambda'\mu' + \frac{1}{4}(\mu')^2 - \lambda'/r = 0 \quad (A4)$$

$$R_{22} = e^{-\lambda} [1 + \frac{1}{2} r(\mu' - \lambda')] - 1 = 0 \quad (A5)$$

$$R_{33} = \sin^2\theta \{e^{-\lambda} [1 + \frac{1}{2} r(\mu' - \lambda')] - 1\} = 0 \quad (A6)$$

$$R_{00} = e^{\mu-\lambda} [-\frac{1}{2}\mu'' + \frac{1}{4}\lambda'\mu' - \frac{1}{4}(\mu')^2 - \mu'/r] = 0 \quad (A7)$$

$$R_{ij} = 0 \text{ if } i \neq j$$

(eq. A4-A7 from pp.303 Sokolnikof(8)): Equation A4 is a mere repetition of equation A6. We thus have only three equations on λ and μ to consider. From equations A4, A7 we deduce that $\lambda' = -\mu'$ so that radial $\lambda = -\mu + \text{constant} = -\mu + C$ where C represents a possible \sim constant ambient metric contribution which (allowing us to set $\sinh\mu = 0$) could be imaginary in the case of the slowly oscillating ambient metric of nearby object B from B2. So $e^{-\mu+C} = e^\lambda$. Then A3-A7 can be written as:

$$e^{-C} e^\mu (1 + r\mu') = 1. \quad (A9)$$

Set $e^\mu = \gamma$. So $e^{-\lambda} = \gamma e^{-C}$ ε and $\Delta\varepsilon$ are time dependent. So integrating this first order equation

(equation A9) we get: $\gamma = -2m/r + e^C \equiv e^\mu = g_{00}$ and $e^{-\lambda} = (-2m/r + e^C) e^{-C} = 1/g_{rr}$

or $e^{-\lambda} = 1/\kappa_{rr} = 1/(1 - 2m'/r)$, $2m/r + e^C = \kappa_{00}$. With (reduced mass ground state rotater ($\Delta\varepsilon$) for charged if $-\varepsilon$) dr zitterbewegung from B1 $\kappa_{rr} dr^2 = e^C \kappa_{00} dr'^2 = e^{i(-\varepsilon + \Delta\varepsilon)^2} \kappa_{00} dr^2$ from A2. We found

$$\kappa_{00} = e^C - 2m/r = e^{i(-\varepsilon + \Delta\varepsilon)^2} - 2m/r \quad (A10)$$

$\Delta\varepsilon$ here is reduced ground state mass $\Delta\varepsilon$ as in Schrodinger eq $E = \Delta\varepsilon = 1/\sqrt{\kappa_{00}}$. (A10a)

does not add anything to r_H/r in κ_{rr} since e^C is not added to r_H/r there.

Appendix B Object B

Add Perturbative Kerr rotation $(a/r)^2$ to r_H/r in κ_{rr} Here nothing gets added to r_H/r in

κ_{00}

Our new pde has spin $S=1/2$ and so the self similar ambient metric on the $N=0$ th fractal scale is the Kerr metric which contains those ambient metric **perturbation rotations** ($d\theta dt$ T violation so (given CPT) then **CP violation**) due to object B caused drop in inertial frame dragging in object A

$$ds^2 = \rho^2 \left(\frac{dr^2}{\Delta} + d\theta^2 \right) + (r^2 + a^2) \sin^2 \theta d\phi^2 - c^2 dt^2 + \frac{2mr}{\rho^2} (a \sin^2 \theta d\theta - c dt)^2, \quad (B1)$$

where $\rho^2(r, \theta) \equiv r^2 + a^2 \cos^2 \theta$; $\Delta(r) \equiv r^2 - 2mr + a^2$, In our 2D $d\phi=0, d\theta=0$ Define:

$$\left(\frac{r^2 + a^2 \cos^2 \theta}{r^2 - 2mr + a^2} \right) dr^2 + \left(1 - \frac{2m}{r^2 + a^2 \cos^2 \theta} \right) dt^2 \quad \theta \neq 0$$

$\rho^2(r, \theta) \equiv r^2 + a^2 \cos^2 \theta$; $\Delta(r) \equiv r^2 - 2mr + a^2$, $r^{\wedge 2} \equiv r^2 + a^2 \cos^2 \theta$, $r'^2 \equiv r^2 + a^2$. Inside r_H $a \ll r, r \gg 2m$

$$\left(\frac{(r^{\wedge})^2}{(r^{\wedge})^2 - 2mr} \right) dr^2 + \left(1 - \frac{2mr}{(r^{\wedge})^2} \right) dt^2 + \dots = \left(\frac{1}{\frac{(r^{\wedge})^2}{(r^{\wedge})^2} - \frac{2mr}{(r^{\wedge})^2}} \right) dr^2 + \left(1 - \frac{2mr}{(r^{\wedge})^2} \right) dt^2.$$

The (r^{\wedge}/r') ² term is $\frac{(r')^2}{(r^{\wedge})^2} = \frac{r^2 + a^2}{r^2 + a^2 \cos^2 \theta} = \frac{1 + \frac{a^2}{r^2}}{1 + \frac{a^2}{r^2} \cos^2 \theta} \approx 1/g_{rr} (\approx g_{\theta\theta})$

$$= \left(1 + \frac{a^2}{r^2} \right) \left(1 - \frac{a^2}{r^2} \cos^2 \theta \right) + \dots = 1 - \frac{a^4}{r^4} \cos^2 \theta - \frac{a^2}{r^2} \cos^2 \theta + \frac{a^2}{r^2} + \dots = 1 + \frac{a^2}{r^2} (1 - \cos^2 \theta) + \dots = 1 + \frac{a^2}{r^2} \sin^2 \theta + \dots \equiv 1 + \left(\frac{a}{r} \right)^2 u^2 = \left(\text{from fig. 6 } \text{mass} = \frac{C_M}{\delta z \delta z} \right) = 1 + 2(\varepsilon + \Delta\varepsilon) + \dots \quad (B2)$$

since $\varepsilon + \Delta\varepsilon$ are time dependent, and add $2m/r$ to this $1 + \varepsilon + \Delta\varepsilon$ at the end. $\Delta\varepsilon$ is *total*

(Mandelbulb) mass as in $C_M/(\delta z \delta z) = (a/r)^2$ in fig6 contributing to inertial frame dragging drop

We can normalize out $1 + \varepsilon$ over a region we know it is (at least approximately) a constant. That in turn makes the metric coefficients at $r \gg 0$ flat which is what they should be. In contrast rotation adds to κ_{rr} (B2) and only oblates $2m/r$ in $\kappa_{\theta\theta}$.

Summary: Our Newpde metric including the effect of object B (with $\tau + \mu = 2m_p = \xi_1$) is for the $\tau + \mu + e$ Kiode

$$\tau + \mu \text{ in free space } r_H = e^2 10^{40(0)} / 2m_p c^2, \kappa_{00} = e^{i(2\Delta\varepsilon/(1-2\varepsilon))} - r_H/r, \kappa_{rr} = 1 + 2\Delta\varepsilon/(1+\varepsilon) - r_H/r \text{ Leptons} \quad (B3)$$

$$\tau + \mu \text{ on } 2P_{3/2} \text{ sphere at } r_H = r, r_H = e^2 10^{40(0)} / 2m_e c^2, \text{comoving with } \gamma = m_p/m_e. \text{ Baryons, part2} \quad (B4)$$

Imaginary $i\Delta\varepsilon$ in this cosmological background metric $\kappa_{00} = e^{i\Delta\varepsilon}$ B13 makes no contribution to the Lamb shift but is the core of partIII cosmological application $g_{\theta\theta} = \kappa_{\theta\theta}$ of eq B13 of this paper.

B1 N=0 eq.B3 Application example: anomalous gyromagnetic ratio Separation Of Variables On New Pde.

After separation of variables the “r” component of Newpde can be written as:

$$\left[\left(\frac{dt}{ds} \sqrt{\kappa_{00}} m_p \right) + m_p \right] F - \hbar c \left(\sqrt{\kappa_{rr}} \frac{d}{dr} + \frac{j+3/2}{r} \right) f = 0 \quad B5$$

$$\left[\left(\frac{dt}{ds} \sqrt{\kappa_{00}} m_p \right) - m_p \right] f + \hbar c \left(\sqrt{\kappa_{rr}} \frac{d}{dr} - \frac{j-1/2}{r} \right) F = 0. \quad B6$$

Using the above Dirac equation component we find the anomalous gyromagnetic ratio Δg for the spin polarized $F=0$ case. Recall the usual calculation of rate of the change of spin S gives $dS/dt \propto m \propto g J$ from the Heisenberg equations of motion. We note that $1/\sqrt{\kappa_{rr}}$ rescales dr in

$\left(\sqrt{\kappa_{rr}} \frac{d}{dr} + \frac{j+3/2}{r} \right) f$ in equation B5 with κ_{rr} from B3. Thus to have the same rescaling of r in the second term we must multiply the second term denominator (i.e., r) and numerator (i.e., $J+3/2$)

each by $1/\sqrt{\kappa_{rr}}$ and set the numerator ansatz equal to $(j+3/2)/\sqrt{\kappa_{rr}} \equiv 3/2 + J(\text{gy})$, where gy is now the gyromagnetic ratio. This makes our equation B5, B6 compatible with the standard Dirac equation allowing us to substitute the gy into the Heisenberg equations of motion for spin S: $dS/dt \propto m \propto \text{gy} J$ to find the correction to dS/dt . Thus again:

$$\begin{aligned} [1/\sqrt{\kappa_{rr}}](3/2 + J) &= 3/2 + J\text{gy}, \text{ Therefore for } J = 1/2 \text{ we have:} \\ [1/\sqrt{\kappa_{rr}}](3/2 + 1/2) &= 3/2 + 1/2\text{gy} = 3/2 + 1/2(1 + \Delta\text{gy}) \end{aligned} \quad \text{B7}$$

Then we solve for Δgy and substitute it into the above dS/dt equation.

Thus solve eq. B7 with Eq.A1 values in $\sqrt{\kappa_{rr}} = 1/\sqrt{(1+2\Delta\epsilon/(1+\epsilon))} = 1/\sqrt{(1+2\Delta\epsilon/(1+0))} = 1/\sqrt{(1+2X.0002826/1)}$. Thus from equation B1:

$[\sqrt{(1+2X.0002826)}](3/2 + 1/2) = 3/2 + 1/2(1 + \Delta\text{gy})$. Solving for Δgy gives anomalous **gyromagnetic ratio correction of the electron** $\Delta\text{gy} = .00116$.

If we set $\epsilon \neq 0$ (so $\Delta\epsilon/(1+\epsilon)$) instead of $\Delta\epsilon$) in the same κ_{00} in Newpde we get the anomalous **gyromagnetic ratio correction of the muon** in the same way.

Composite 3e: Meisner effect For B just outside r_H . (where the zero point energy particle eq. 9.22 is $.08 = \pi^\pm$) See A4

Composite 3e CASE 1: Plus $+r_H$, therefore is the proton + charge component. Eq.A4: $1/\kappa_{rr} = 1 + r_H/r_H + \epsilon'' = 2 + \epsilon''$. $\epsilon'' = .08$ (eq.9.22). Thus from eq.B17 $\sqrt{2 + \epsilon''}(1.5 + .5) = 1.5 + .5(\text{gy})$, $\text{gy} = 2.8$

The gyromagnetic ratio of the proton

Composite 3e CASE 2: negative r_H , thus charge cancels, zero charge:

$$\begin{aligned} 1/\kappa_{rr} = 1 - r_H/r_H + \epsilon'' = \epsilon'' \quad \text{Therefore from equation B7 and case 1 eq.A3 } 1/\kappa_{rr} &= 1 - r_H/r_H + \epsilon'' \\ \sqrt{\epsilon''}(1.5 + .5) &= 1.5 + .5(\text{gy}), \text{ gy} = -1.9. \end{aligned}$$

the **gyromagnetic ratio of the neutron** with the other charged and those ortho neutral hyperon magnetic moments scaled using their masses by these values respectively.

A4 eq.B3 κ_{00} application example: Lamb shift

After separation of variables the “r” component of Newpde can be written as

$$\left[\left(\frac{dt}{ds} \sqrt{\kappa_{00}} m_p \right) + m_p \right] F - \hbar c \left(\sqrt{\kappa_{rr}} \frac{d}{dr} + \frac{j+3/2}{r} \right) f = 0 \quad \text{B8}$$

$$\left[\left(\frac{dt}{ds} \sqrt{\kappa_{00}} m_p \right) - m_p \right] f + \hbar c \left(\sqrt{\kappa_{rr}} \frac{d}{dr} - \frac{j-1/2}{r} \right) F = 0. \quad \text{B9}$$

Comparing the flat space-time Dirac equation to the left side terms of equations B8 and B9:

$$(dt/ds)\sqrt{\kappa_{00}} = (1/\kappa_{00})\sqrt{\kappa_{00}} = (1/\sqrt{\kappa_{00}}) = \text{Energy} = E \quad \text{B10}$$

We have normalized out the e^c in equation B10 to get the pure measured r_H/r coupling relative to a laboratory flat background given thereby in that case by κ_{00} under the square root in equation B10.

Note for electron motion around hydrogen proton $mv^2/r = ke^2/r^2$ so $KE = 1/2mv^2 = (1/2)ke^2/r = PE$ potential energy in $PE + KE = E$. So for the electron (but not the tauon or muon that are not in this orbit) $PE_e = 1/2e^2/r$. Write the hydrogen energy and pull out the electron contribution B10a. So in eq.B2 and B8 $r_H = (1+1+.5)e^2/(m_\tau + m_\mu + m_e)/2 = 2.5e^2/(2m_p c^2)$. B11

Variation $\delta(\psi^* \psi) = 0$ At $r = n^2 a_0$

Next note for the variation in $\psi^* \psi$ is equal to zero at maximum $\psi^* \psi$ probability density where for the hydrogen atom is at $r = n^2 a_0 = 4a_0$ for $n=2$ and the $\psi_{2,0,0}$ eigenfunction. Also recall eq.A4 eq.11a $\xi_1 = m_L c^2 = (m_\tau + m_\mu + m_e)c^2 = 2m_p c^2$ normalizes $1/2ke^2$ (Thus divide $\tau + \mu$ by 2 and then multiply the whole line by 2 to normalize the $m_e/2$. result. $\epsilon = 0$ since no muon ϵ here.): Recall in eq.11a ξ_0 has to be pulled in a Taylor expansion as an operator since it a separate observable. So substituting eqs.B1 for κ_{00} , values in eq.B10:

$$E_e = \frac{(tauon+muon)(\frac{1}{2})}{\sqrt{1-\frac{r_H'}{r}}} - (tauon + muon + PE_\tau + PE_\mu - m_e c^2) \frac{1}{2} =$$

$$2(m_\tau c^2 + m_\mu c^2) \frac{1}{2} + 2 \frac{m_e c^2}{2} + 2 \frac{2.5e^2}{2r(m_L c^2)} m_L c^2 - 2 \frac{2e^2}{2r(m_L c^2)} m_L c^2 - 2 \frac{3}{8} \left(\frac{2.5e^2}{r m_L c^2} \right)^2 m_L c^2$$

$$- 2(m_\tau c^2 + m_\mu c^2) \frac{1}{2}$$

$$= \frac{2m_e c^2}{2} + 2 \frac{e^2}{4r} - 2 \frac{3}{8} \left(\frac{2.5}{r m_L c^2} \right)^2 m_L c^2 = m_e c^2 + \frac{e^2}{2r} - 2 \frac{3}{8} \left(\frac{2.5e^2}{r m_L c^2} \right)^2 m_L c^2$$

So: $\Delta E_e = 2 \frac{3}{8} \left(\frac{2.5}{r m_L c^2} \right)^2 m_L c^2 =$ (Third order $\sqrt{\kappa_{\mu\mu}}$ Taylor expansion term)=

$$\Delta E = 2 \frac{3}{8} \left[\frac{2.5(8.89 \times 10^9)(1.602 \times 10^{-19})^2}{(4(.53 \times 10^{-10}))^2 ((1.67 \times 10^{-27})(3 \times 10^8))^2} \right]^2 (2(1.67 \times 10^{-27})(3 \times 10^8)^2)$$

$$= hf = 6.626 \times 10^{-34} \times 27,360,000 \text{ so that } f = 27 \text{ MHz Lamb shift.}$$

The other 1050Mhz comes from the zitterbewegung cloud.

Note: Need infinities if **flat space Dirac 1928 equation**. For flat space $\partial g_{ik}/\partial x^j = 0$ as a limit. Then must take field $g^{km} = 1/0 = \infty$ to get finite Christoffel symbol $\Gamma^{m}_{ij} = (g^{km}/2)(\partial g_{ik}/\partial x^j + \partial g_{jk}/\partial x^i - \partial g_{ij}/\partial x^k) = (1/0)(0) = \text{undefined}$ but still implying *nonzero* acceleration on the left side of the

geodesic equation: $\frac{d^2 x^\mu}{ds^2} = -\Gamma^{\mu}_{\nu\lambda} \frac{dx^\nu}{ds} \frac{dx^\lambda}{ds}$ So we need infinite fields for flat space. Thus QED

requires (many such) infinities. But we have in general curved space $g_{ij} = \kappa_{ij}$ in the New pde so do not require that anything be infinite and yet we still obtain for the third order Taylor expansion term of $\sqrt{\kappa_{\mu\nu}}$ the Lamb shift and anomalous gyromagnetic ratio correction (see above sections B3,B4).

So renormalization is a perturbative way (given it's flat space Dirac equation and minimal interaction gauge origins) of calculating these (above) same, *NON*perturbative results, it's a perturbative GR theory. But renormalization gives lots of wrong answers too, eg., 10^{96} grams/cm³ vacuum density for starters. (So we drop it here since we don't need it any longer for the high precision QED results.) In contrast note near the end of reference 5 our $G_{00} = 0$ for a 2D MS. Thus a vacuum really is a vacuum. Also that large $\xi_1 = \tau(1 + \epsilon')$ in r_H in eq.B13,11a is the reason leptons appear point particles (in contrast to the small ξ_0 in the composite 3e baryons).

B5 eq.B3 κ_{00} application example: metric quantization from $g_{00} = \kappa_{00}$

Given the subatomic fractal scale is dominated by quantum mechanics phenomena in a fractal universe the next higher $N=1$ fractal scale should bring the QM back: In galaxy halos $g_{00} = \kappa_{00}$ (eq.4.13) with resulting Metric Quantization $N=1$ result $g_{00} = \kappa_{00}$, in galaxy halos (eg., replacing need for dark matter Note we have yet to use the $e^{i(2\Delta\epsilon/(1-2\epsilon))}$ in $\kappa_{00} = e^{i(\Delta\epsilon/(1-2\epsilon))} \cdot r_H/r$ of equation B13. $mv^2/r = GMm/r^2$ is always true (eg., globulars orbiting out of plane) but so is $g_{00} = \kappa_{00}$ in the plane of a flattened galaxy (rotating central black hole planar effect partIII). That $g_{00} = \kappa_{00}$ in the halo of the Milky Way galaxy is the fundamental equation of metric quantization. So again $mv^2/r = GMm/r^2$ so $GM/r = v^2$ COM in the galaxy halo (circular orbits) ($1/(1-2\epsilon)$ term from κ_{00} in B13) so

Pure state $\Delta\epsilon$ (ϵ excited $1S_{1/2}$ state of ground state $\Delta\epsilon$, so not same state as $\Delta\epsilon$)

Rel κ_{00} =cos μ from B13 κ_{00}

Case 1 $1-2GM/(c^2r)=1-2(v/c)^2=1-(2\Delta\varepsilon/(1-2\varepsilon))^2/2$ (B12)

So $1-2(v/c)^2=1-(2\Delta\varepsilon/(1-2\varepsilon))^2/2$ so $=(2\Delta\varepsilon/(1-2\varepsilon))c/2=2X.0002826/(1-(.05946)^2)(3X10^8)/2$
 $=99\text{km/sec} \approx 100\text{km/sec}$ (Mixed $\Delta\varepsilon, \varepsilon$, states classically here are grand canonical ensembles with nonzero chemical potential.). For ringed (not hub) galaxies the radial value becomes $100/2=50\text{km/sec}$.

Also $v=(2\Delta\varepsilon/(1-2\varepsilon))c/2$ so $v/c=\text{constant}$.

Mixed state $\varepsilon\Delta\varepsilon$ (Again $GM/r=v^2$ so $2GM/(c^2r)=2(v/c)^2$.)

Case 2 $g_{00}=1-2GM/(c^2r)=\text{Rel}\kappa_{00}=\cos[2\Delta\varepsilon+\varepsilon]=1-[\Delta\varepsilon+\varepsilon]^2/2=1-[(2\Delta\varepsilon+\varepsilon)^2/(\Delta\varepsilon+\varepsilon)]^2/2=$
 $1-[(2\Delta\varepsilon^2+\varepsilon^2+2\varepsilon\Delta\varepsilon)/(2\Delta\varepsilon+\varepsilon)]^2$

The $2\Delta\varepsilon^2$ is just the above first case (Case 1) so just take the mixed state cross term $[\varepsilon 2\Delta\varepsilon/(\varepsilon+2\Delta\varepsilon)]=c[2\Delta\varepsilon/(1+\Delta\varepsilon/\varepsilon)]/2=c[2\Delta\varepsilon+\Delta\varepsilon^2/\varepsilon+\dots 2\Delta\varepsilon^{N+1}/\varepsilon^{N+1}]/2=\Sigma v_N$. Note each term in this expansion is itself a (mixed state) operator. So there can't be a single v in the large gradient 2nd case so in the equation just above we can take $v_N=[2\Delta\varepsilon^{N+1}/(2\varepsilon^N)]c$. (B13)

From eq. B23 for example $v=m100^N\text{km/sec}$. $m=2, N=1$ here (Local arm). In part III we list hundreds of examples of B13: (sun1,2km/sec, galaxy halos m100km/sec). The linear mixed state subdivision by this ubiquitous ~ 100 scale change factor in r_{bb} (due to above object B zitterbewegung spherical Bessel function resonance boundary conditions resulting in nodes) created the voids. Same process for $N-1$ (so 100X smaller) antinodes get galaxies, 100Xsmaller: globular clusters, 100Xsmaller solar systems, etc., So these smaller objects were also created by mixed state metric quantization (eq.B13) resonance oscillation inside initial radius r_{bb} .

We include the effects of that object B drop in inertial frame dragging on the inertial term m in the Gamow factor and so lower Z nuclear synthesis at earlier epochs ($t > 18\text{by}$)BCE. (see partIII)

Appendix C. Object C with spinor ansatz for eq.12(gives ordinary field theory SM)

For the $N=1$ huge observer $\delta z \gg \delta z \delta z$ from eq.3. Thus the required $N=-1, N=0$ tiny observable ($\delta z' \ll \delta z$) is a perturbation of the eq.7 $\delta z \approx dr \approx dt$ at 45° $(dr-\delta z')+(dt+\delta z') \equiv dr'+dt'=ds$ (16)
 But for the high energy big $\delta \delta z$ (extreme "axis" perturbations) δz is small. So finding big $\delta \delta z$ 'observables' requires we artificially stay on the circle (appendix C) implying this additional $\delta z'$ eq7 perturbation. These large rotations can then be done as

spinor rotations \rightarrow Pauli matrices \rightarrow isomorphic to quaternions

So we finally include the orthogonal axis' to orthogonal axis extreme ds rotations in eq. 16. So on the circle. Recall from sect.1 eq.3 that $\delta C = \delta(\delta z + \delta z \delta z) = \delta \delta z(1) + \delta \delta z(\delta z) + (\delta z)\delta \delta z = \delta C = 0$ so C is split between $\delta \delta z$ noise and $\delta z \delta z$ and classical ds^2 proper time. Note for $N=1$ $|\delta z| \gg 1$ and $C_M \gg 1$. So eq.5 holds then. But for high energies (like those provided by an accelerator) as γ is boosted observer $\delta z/\gamma$, C/γ gets smaller than the huge $N=1$ scale (so higher energy, smaller wavelength beam probes) $\delta \delta z(1)/ds$ noise angle gets relatively larger (relative to $\delta(\delta z \delta z)/ds$, sect.1) until finally the next smaller (and next smaller one after that at $N=-1$) is the $N=0$ fractal scale becomes relatively large.

Large rotation angle $\delta \delta z/ds$ can then be those large axis' ds extreme $\pm 45^\circ$ min ds and so two possible 45° rotations so through a total of two quadrants for $\pm \delta z'$ in eq.16.(a single δz just gives e, v back) One such rotation around a axis (SM) and the other around a diagonal (SC).

These rotations are

I→II, II→III, III→IV, IV→I required extremum to eq.16 extremum rotations in eq.7-9 plane Give SM Bosons at high interaction COM energies(when $\delta\delta z$ gets big). $N=0$

Note in fig.3 dr, dt is also a rotation. and so has an eq.11 rotation operator observable θ . Thus from equation 11 for (θ) angle rotations $\theta\delta z = (dr/ds)\delta z = -i\partial(\delta z)/\partial r$ for the first 45° rotation. So we got through one Newpde derivative for each 45° rotation. For the next 45° rotation in fig.4 it is then a second derivative $\theta\theta\delta z' = e^{i\theta p} e^{i\theta'} \delta z = e^{i(\theta p + \theta')} \delta z = (dr/ds)((dr/ds)dr') = -i\partial(-i\partial(dr'))/\partial r = -\partial^2(dr')/\partial r^2$ large angle rotation in figure 3. In contrast for $z=1$, $\delta z'$ small so $45^\circ-45^\circ$ small angle rotation in figure 3 (so then $N=-1$). Do the same with the time t and get for $z=0$ rotation of $45^\circ+45^\circ$ (fig.4) then $\theta\theta\delta z' = (d^2/dr^2)z' + (d^2/dt^2)\delta z'$ (C1)

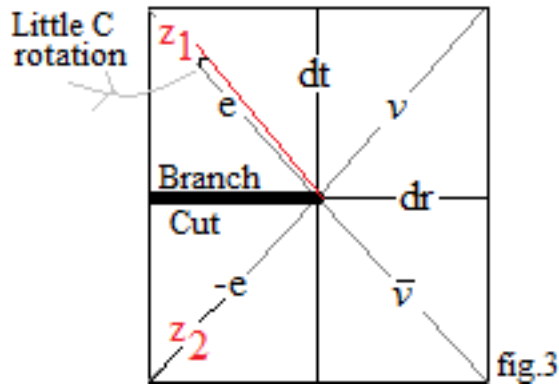


fig.3. for $45^\circ-45^\circ$ So two body (e, v) singlet $\Delta S = 1/2 - 1/2 = 0$ component so pairing interaction (sect.4.5). Also ortho $\Delta S = 1/2 + 1/2 = 1$ making 2 body (at $r=r_H$) $S=1$ Bosons and so a field theory. Note we also get these Laplacians characteristic of the Boson field equations by those $45^\circ+45^\circ$ rotations so eq.16 implies Bosons accompany our leptons (given the $\delta z'$), **so these leptons exhibit "force"**.

Newpde $r=r_H, z=0, 45^\circ+45^\circ$ rotation of composites e, v implied by Equation 12

So $z=0$ allows a large C z rotation application from the 4 different axis' max extremum (of eq.16) branch cuts gives the 4 results: $Z, +, -W$, photon bosons of the Standard Model. So we have derived the Standard Model of particle physics in this very elegant way (from the four axis'). You are physically at $r=r_H$ if you rotate through the electron quadrants (I, IV). of eq.7-9. So we have large C_M dichotomic 90° rotation to the next Reimann surface of eq.12, eq.A1 $(dr^2+dt^2)z''$ from some initial extremum angle(s) θ . Eq.16 solutions imply complex 2D plane Stern Gerlach dichotomic rotations using eq.A1 thereby using Pauli matrices σ_i algebra, which maps one-to-one to the quaternion algebra. Using eq.12 we start at some initial angle θ and rotate by 90° the noise rotations are: $C = \delta z'' = [e_L, v_L]^T \equiv \delta z'(\uparrow) + \delta z'(\downarrow) \equiv \psi(\uparrow) + \psi(\downarrow)$ has a eq.12 infinitesimal unitary generator $\delta z'' \equiv U = 1 - (i/2)\epsilon n \cdot \sigma$, $n \equiv \theta/\epsilon$ in $ds^2 = U^t U$. But in the limit $n \rightarrow \infty$ we find, using elementary calculus, the result $\exp(-(i/2)\theta \cdot \sigma) = \delta z''$. We can use any axis as a branch cut since all 4 are eq.20 large extremum so for the 2nd rotation we move the branch cut 90° and measure the angle off the next diagonal since Pauli matrix dichotomic rotations are actually axis rotations, leaving our e and v directions the same. In any case $(dr+dt)z''$ in eq.16 can then be replaced by eq.A1 $(dr^2+dt^2+..) \delta z'' = (dr^2+dt^2+..) e^{\text{quaternion A}}$ Bosons because of eq.C1.

C2 Then use eq. 12 and quaternions to rotate $\delta z''$ since the quaternion formulation is isomorphic to the Pauli matrices. $dr' = \delta z_i = \kappa_{ri} dr$ for **Quaternion A** $\kappa_{ii} = e^{iA_i}$.

Possibly large $\delta\delta z$ in eq.3 $\delta(\delta z+\delta z\delta z)=0$ so large rotations in eq12 i.e., high energy, tiny $\sqrt{\kappa_{00}}$ since τ normalized to 1 allows formalism for object C

C1 for the eq.12:large $\theta=45^\circ+45^\circ$ rotation (for $N=0$ so large $\delta z'=\theta r_H$). Instead of the equation 13,15 formulation of κ_{ij} for small $\delta z'$ ($z=1$) and large $\theta=45^\circ+45^\circ$ we use A_r in dr direction with $dr^2=x^2+dy^2+dz^2$. So we can again use 2D (dr,dt) $E=1/\sqrt{\kappa_{00}}=1/\sqrt{e^{iA_i}}=e^{-iA/2}$. The 1 is mass energy and the first real component after that in the Taylor expansion is field energy A^2 . For 2 particles together the other particle ε negative means r_H is also negative. Since it is $e_1^*e_2=r_H$. So $1/\kappa_r=1+(-\varepsilon+r_H/r)$ is \pm and $1-(-\varepsilon+r_H/r)$ 0 charge. (C0)

For baryons with a 3 particle r_H/r may change sign without third particle ε changing sign so that at $r=r_H$. Can normalize out the background ε in the denominator of $E=(\tau+\varepsilon)/\sqrt{(1+\varepsilon+\Delta\varepsilon-r_H/r)}$ for Can normalize out the background ε in the denominator of $E=(\tau+\varepsilon)/\sqrt{(1+\varepsilon+\Delta\varepsilon-r_H/r)}$ for small conserved (constant) energies $1/\sqrt{(1+\varepsilon)}$ and (so $E=(1/\sqrt{(1+x)})=1-x/2+$) large r (so large λ so not on r_H)implies the normalization is:

$E=(\varepsilon+\tau)/\sqrt{((1-\varepsilon/2-\varepsilon/2)/(1\pm\varepsilon/2))}$, $J=0$ para e,ν eq.9.23 π^\pm,π^0 . For large $1/\sqrt{\Delta\varepsilon}$ energies given small $r=r_H$, Here $1+\varepsilon$ is locally constant so can be normalized out as in

$$E=(\varepsilon+\tau)/\sqrt{(1-(\Delta\varepsilon/(1\pm\varepsilon))-r_H/r)}, \text{ for charged if -, ortho } e,\nu J=1,W^\pm,Z_0 \quad (11d)$$

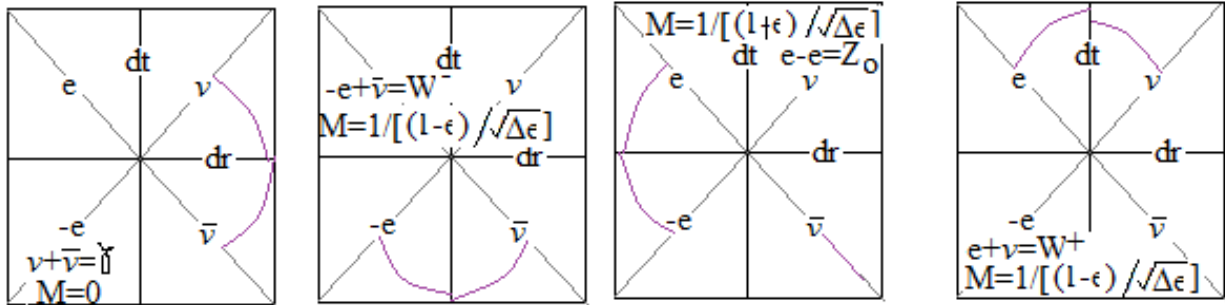


fig4

Fig.4 applies to eq.9 $45^\circ+45^\circ=90^\circ$ case: **Bosons**.

C2 These quadrants were defined in eq.7-9 and used in eq.12. The Appendix C4 derivation applies to the far right side figure. Recall from eq.16 $z=0$ result $C_M=45^\circ+45^\circ=90^\circ$, gets Bosons. $45^\circ-45^\circ=$ leptons. The ν in quadrants II(eq.5) and III (eq.9). e in quadrants I (eq.7) and IV (eq.7). Locally normalize out $1+\varepsilon$ (appendix D). For the **composite** e,ν on those required large $z=0$ eq.9 rotations for $C\rightarrow 0$, and for stability $r=r_H$ (eg., for $2P_{1/2}$, $I\rightarrow II$, $III\rightarrow IV$, $IV\rightarrow I$) unless $r_H=0$ ($II\rightarrow III$)

Example:

C4 Quadrants IV \rightarrow I rotation eq.C2 $(dr^2+dt^2+..)^{e\text{quaternion } A}$ =rotated through C_M in eq.16.

example C_M in eq.C1 is a 90° CCW rotation from 45° through ν and anti ν

A is the 4 potential. From eq.17 we find after taking logs of both sides that $A_0=1/A_r$ (A2)

Pretending we have a only two i,j quaternions but still use the quaternion rules we first do the r

$$\begin{aligned} \text{derivative: From eq. C1 } dr^2\delta z &= (\partial^2/\partial r^2)(\exp(iA_r+jA_0)) = (\partial/\partial r)[(i\partial A_r/\partial r + \partial A_0/\partial r)(\exp(iA_r+jA_0))] \\ &= \partial/\partial r[(\partial/\partial r)iA_r + (\partial/\partial r)jA_0](\exp(iA_r+jA_0)) + [i\partial A_r/\partial r + j\partial A_0/\partial r]\partial/\partial r(\exp(iA_r+jA_0)) \\ &+ (i\partial^2 A_r/\partial r^2 + j\partial^2 A_0/\partial r^2)(\exp(iA_r+jA_0)) + [i\partial A_r/\partial r + j\partial A_0/\partial r][i\partial A_r/\partial r + j\partial/\partial r(A_0)] \exp(iA_r+jA_0) \quad (A3) \end{aligned}$$

Then do the time derivative second derivative $\partial^2/\partial t^2(\exp(iA_r+jA_0)) = (\partial/\partial t)[(i\partial A_r/\partial t + \partial A_0/\partial t)$

$$\begin{aligned} (\exp(iA_r+jA_0)) &= \partial/\partial t[(\partial/\partial t)iA_r + (\partial/\partial t)jA_0](\exp(iA_r+jA_0)) + \\ &[i\partial A_r/\partial r + j\partial A_0/\partial t]\partial/\partial r(\exp(iA_r+jA_0)) + (i\partial^2 A_r/\partial t^2 + j\partial^2 A_0/\partial t^2)(\exp(iA_r+jA_0)) \\ &+ [i\partial A_r/\partial t + j\partial A_0/\partial t][i\partial A_r/\partial t + j\partial/\partial t(A_0)]\exp(iA_r+jA_0) \quad (C4) \end{aligned}$$

Adding eq. C2 to eq. C4 to obtain the total D'Alambertian C3+C4=

$$[i\partial^2 A_r/\partial r^2 + i\partial^2 A_r/\partial t^2] + [j\partial^2 A_o/\partial r^2 + j\partial^2 A_o/\partial t^2] + ii(\partial A_r/\partial r)^2 + ij(\partial A_r/\partial r)(\partial A_o/\partial r) + ji(\partial A_o/\partial r)(\partial A_r/\partial r) + jj(\partial A_o/\partial r)^2 + ii(\partial A_r/\partial t)^2 + ij(\partial A_r/\partial t)(\partial A_o/\partial t) + ji(\partial A_o/\partial t)(\partial A_r/\partial t) + jj(\partial A_o/\partial t)^2 .$$

Since $ii=-1$, $jj=-1$, $ij=-ji$ the middle terms cancel leaving $[i\partial^2 A_r/\partial r^2 + i\partial^2 A_r/\partial t^2] +$

$$[j\partial^2 A_o/\partial r^2 + j\partial^2 A_o/\partial t^2] + ii(\partial A_r/\partial r)^2 + jj(\partial A_o/\partial r)^2 + ii(\partial A_r/\partial t)^2 + jj(\partial A_o/\partial t)^2$$

Plugging in C2 and C4 gives us cross terms $jj(\partial A_o/\partial r)^2 + ii(\partial A_r/\partial t)^2 = jj(\partial(-A_r)/\partial r)^2 + ii(\partial A_r/\partial t)^2$

$$= 0. \text{ So } jj(\partial A_r/\partial r)^2 = -jj(\partial A_o/\partial t)^2 \text{ or taking the square root: } \partial A_r/\partial r + \partial A_o/\partial t = 0 \quad (C5)$$

$$i[\partial^2 A_r/\partial r^2 + i\partial^2 A_r/\partial t^2] = 0, \quad j[\partial^2 A_o/\partial r^2 + i\partial^2 A_o/\partial t^2] = 0 \text{ or } \partial^2 A_\mu/\partial r^2 + \partial^2 A_\mu/\partial t^2 + .. = 1 \quad (C6)$$

A4 and A5 are **Maxwell's equations** (Lorentz gauge formulation) in free space, if $\mu=1,2,3,4$.

$$\square^2 A_\mu = 1, \quad \square \bullet A_\mu = 0 \quad (C7)$$

This looks like the Lorentz gauge formalism but it is actually a fundamental field equation (not interchangeable with some other as in gauge theories) hence it is *no gauge at all* and we have also avoided the Maxwell overdeterminism problem (8eq, 6 unknowns E_i, B_i). Must use Newpde 4D orthogonalization here. Amplitudes of physical processes in QED in the noncovariant Coulomb gauge coincide with those in the covariant Lorenz gauge. The Aharonov–Bohm effect depends on a line integral of \mathbf{A} around a closed loop, and this integral is not changed by $\mathbf{A} \rightarrow \mathbf{A} + \nabla\psi$ which doesn't change $\mathbf{B} = \nabla \times \mathbf{A}$ either. So formulation in the Lorentz gauge mathematics works (but again C7 is no longer a gauge).

Geodesics

Recall equation 17. $g_{oo} = 1 - 2e^2/rm_c c^2 \equiv 1 - eA_o/mc^2 v^o$. We determined A_o , (and A_1, A_2, A_3) in appendix A4, eq.A2. We plug this A_i into the geodesics

$$\frac{d^2 x^\mu}{ds^2} = -\Gamma_{\nu\lambda}^\mu \frac{dx^\nu}{ds} \frac{dx^\lambda}{ds} \quad (5.9)$$

where $\Gamma^{m}_{ij} \equiv (g^{km}/2)(\partial g_{ik}/\partial x^j + \partial g_{jk}/\partial x^i - \partial g_{ij}/\partial x^k)$

So in general
$$g_{ii} \equiv \eta_{ii} + h_{ii} = 1 - \frac{eA_i(x,t)}{m_\tau c^2 v^i}, i \neq 0, \quad (5.10)$$

$$A'_0 \equiv e\phi / m_\tau c^2, \quad g_{00} \equiv 1 - \frac{e\phi(x,t)}{m_\tau c^2} = 1 - A'_0, \text{ and define } g'_{\alpha\alpha} \equiv 1 - A'_\alpha / v_\alpha, (\alpha \neq 0) \text{ and}$$

$g''_{\alpha\alpha} \equiv g'_{\alpha\alpha} / 2$ for large and near constant v , see eq. 14 also. In the weak field $g^{ii} \approx 1$. Note $e=0$ for the photon so it is not deflected by these geodesics whereas a gravity field does deflect them. The photon moves in a straight line through a electric or magnetic field. Also use the total

differential $\frac{\partial g_{11}}{\partial x^\alpha} dx^\alpha = dg_{11}$ so that using the chain rule gives us:

$$\frac{\partial g_{11}}{\partial x^\alpha} \frac{dx^\alpha}{dx^0} = \frac{\partial g_{11}}{\partial x^\alpha} v^\alpha = \frac{dg_{11}}{dx^0} \approx \frac{\partial g_{11}}{\partial x^0}.$$

gives a new $A(1/v^2)dv/dt$ force term added to the first order Lorentz force result in these geodesic equations (Sokolnikoff, pp.304). So plugging equation 4.24 into equation 4.23, the geodesic equations gives:

$$\begin{aligned}
-\frac{d^2x^1}{ds^2} &= \Gamma_{11}^1 v_1 v_1 + \Gamma_{12}^1 v_1 v_2 + \Gamma_{13}^1 v_1 v_3 + \Gamma_{10}^1 v_0 v_1 + \Gamma_{21}^1 v_2 v_1 + \Gamma_{22}^1 v_2 v_2 + \Gamma_{23}^1 v_2 v_3 + \Gamma_{20}^1 v_2 v_0 + \\
&\Gamma_{31}^1 v_3 v_1 + \Gamma_{32}^1 v_3 v_2 + \Gamma_{33}^1 v_3 v_3 + \Gamma_{30}^1 v_3 v_0 + \Gamma_{01}^1 v_0 v_1 + \Gamma_{02}^1 v_0 v_2 + \Gamma_{03}^1 v_0 v_3 + \Gamma_{00}^1 v_0 v_0 = \\
&\frac{g^{11}}{2} \left(\frac{\partial g'_{11}}{\partial x^1} \right) v_1 + \frac{g^{11}}{2} \left(\frac{\partial g'_{11}}{\partial x^2} \right) v_2 + \frac{g^{11}}{2} \left(\frac{\partial g'_{11}}{\partial x^3} \right) v_3 + \frac{g^{11}}{2} \left(\frac{\partial g'_{11}}{\partial x^0} \right) v_0 + \\
&\frac{g^{11}}{2} \left(\frac{\partial g'_{11}}{\partial x^2} \right) v_2 - \frac{g^{11}}{2} \left(\frac{\partial g'_{22}}{\partial x^1} \right) v_2 + 0 + 0 + \frac{g^{11}}{2} \left(\frac{\partial g'_{11}}{\partial x^3} \right) v_3 + 0 - \frac{g^{11}}{2} \left(\frac{\partial g'_{33}}{\partial x^1} \right) v_3 + 0 + \\
&\frac{g^{11}}{2} \left(\frac{\partial g'_{11}}{\partial x^0} \right) v_0 + 0 + 0 - \frac{g^{11}}{2} \left(\frac{\partial g'_{00}}{\partial x^1} \right) v_0 + O\left(\frac{A_i dv}{v^2 dt}\right) = v_2 \left(\frac{\partial g''_{11}}{\partial x^2} - \frac{\partial g''_{22}}{\partial x^1} \right) + v_3 \left(\frac{\partial g''_{11}}{\partial x^3} - \frac{\partial g''_{33}}{\partial x^1} \right) + \\
&\left(\frac{\partial g''_{11}}{\partial x^\alpha} v_\alpha + \frac{\partial g''_{11}}{\partial x^0} v_0 \right) - \left(\frac{\partial g''_{00}}{\partial x^1} \right) v_0 + O\left(\frac{A_i dv}{v^2 dx}\right) \approx - \left(\frac{\partial g''_{00}}{\partial x^1} \right) v_0 + v_2 \left(\frac{\partial g''_{11}}{\partial x^2} - \frac{\partial g''_{22}}{\partial x^1} \right) + \\
&v_3 \left(\frac{\partial g''_{11}}{\partial x^3} - \frac{\partial g''_{33}}{\partial x^1} \right) + O\left(\frac{A_i dv}{v^2 dt}\right) \approx \frac{e}{m_\tau c^2} \left(-\vec{\nabla} \phi + \vec{v} X (\vec{\nabla} X \vec{A}) \right)_x + O\left(\frac{A_i dv}{v^2 dr}\right). \text{ Thus we have the}
\end{aligned}$$

Lorentz force equation form $\left(-\left(\frac{e}{m_\tau c^2} \right) (\vec{\nabla} \phi + \vec{v} X (\vec{\nabla} X \vec{A})) \right)_x$ plus the derivatives of $1/v$ which are of the form: $\mathbf{A}_i(d\mathbf{v}/dr)_{av}/v^2$. **This new term $A(1/v^2)dv/dr$ is the pairing interaction (5.11).**

C5 Other 45°+45° Rotations (Besides above quadrants IV→I)

Proca eq

In the 1st to 2nd, 3rd to 4th quadrants the A_u is already there as a single v in the rotation the mass is in both quadrants and in the end we multiply by the A_u so get the $m^2 A_u^2$ term in the Proca eq. for the W^+, W^- . The mass still gets squared for the 2nd to 3rd quadrant rotation Z_0 ..

For the **composite e, v** on those required large $z=0$ eq.16 rotations for $C \approx 0$, and for stability $r=r_H$ for $2P_{1/2}$ (I→II, III→IV, II→III) unless $r_H=0$ (IV→I) are:

Ist→IInd quadrant rotation is the W^+ at $r=r_H$. Do similar math to C2-C7 math and get instead a Proca equation The limit $\varepsilon \rightarrow 1 = \tau$ (D13) in ξ_1 at $r=r_H$. since Hund's rule implies $\mu = \varepsilon = 1S_{1/2} \leq 2S_{1/2} = \tau = 1$. So the ε is negative in $\Delta\varepsilon/(1-\varepsilon)$ as in case 1 charged as in appendix A1 case 2.

$$E = 1/\sqrt{(\kappa_{00})} - 1 = [1/\sqrt{(1-\Delta\varepsilon/(1-\varepsilon)-r_H/r)}] - 1 = [1/\sqrt{(\Delta\varepsilon/(1-\varepsilon))}] - 1. E_t = E + E = 2/\sqrt{(\Delta\varepsilon/(1-\varepsilon))} = W^+ \text{ mass.}$$

$E_t = E - E$ gives E&M that also interacts weakly with weak force.

IIIrd →IV quadrant rotation is the W^- . Do the math and get a Proca equation again.

$$E = 1/\sqrt{(\kappa_{00})} - 1 = [1/\sqrt{(1-\Delta\varepsilon/(1-\varepsilon)-r_H/r)}] - 1 = [1/\sqrt{(\Delta\varepsilon/(1-\varepsilon))}] - 1. E_t = E + E = 2/\sqrt{(\Delta\varepsilon/(1-\varepsilon))} = W^- \text{ mass.}$$

$E_t = E - E$ gives E&M that also interacts weakly with weak force.

II → III quadrant rotation is the Z_0 . Do the math and get a Proca equation. C_M charge cancelation. B14 gives $1/(1+\varepsilon)$ gives 0 charge since $\varepsilon \rightarrow 1$ to case 1 in appendix C2.

$$E = 1/\sqrt{(\kappa_{00})} - 1 = [1/\sqrt{(1-\Delta\varepsilon/(1+\varepsilon)-r_H/r)}] - 1 = [1/\sqrt{(\Delta\varepsilon/(1+\varepsilon))}] - 1. E_t = E + E = 2/\sqrt{(\Delta\varepsilon/(1+\varepsilon))} - 1 = Z_0 \text{ mass.}$$

$E_t = E - E$ gives E&M that also interacts weakly with weak force. Seen in small left handed polarization rotation of light.

IV→I quadrant rotation through those 2 neutrinos gives 2 objects. $r_H=0$

$E=1/\sqrt{\kappa_{00}}-1=[1/\sqrt{(1-\Delta\varepsilon/(1+\varepsilon))}-1]=\Delta\varepsilon/(1+\varepsilon)$. Because of the +- square root $E=E+-E$ so E rest mass is 0 or $\Delta\varepsilon=(2\Delta\varepsilon)/2$ reduced mass.

$E_t=E+E=2E=2\Delta\varepsilon$ is the pairing interaction of SC. The $E_t=E-E=0$ is the 0 rest mass photon Boson. Do the math (eq.C2-C7) and get Maxwell's equations. Note there was no charge C_M on the two ν s. Note we get SM particles out of composite e,ν using required eq.9 rotations for

C6 Object B Effect On Inertial Frame Dragging (from appendix B)

The fractal implications are that we are inside a cosmological positron inside a proton $2P_{3/2}$ at $r=r_H$ state. The cosmological object (electron) we are inside of is a positron and call it object A which orbits electron object B with a given distant 3rd object C. Object B is responsible for the mass of the electron since it's frame dragging creates that Kerr metric $(a/r)^2=m_e c^2$ (B9) result used in eq.D9. So Newpde ground state $m_e c^2 \equiv \langle H_e \rangle$ is the fundamental Hamiltonian eigenvalue defining idea for composite e,ν , $r=r_H$ implying Fermi 4 point $E = \int \psi^\dagger H \psi dV = \int \psi^\dagger \psi H dV = \int \psi^\dagger \psi G$

$$\text{Recall for composite } e,\nu \text{ all interactions occur inside } r_H \text{ (4}\pi/3)\lambda^3 = V_{rH}. \frac{1}{v^{1/2}} = \psi_e = \psi_3 \frac{1}{v^{1/2}} = \psi_\nu = \psi_4 \text{ so 4pt } \iiint_0^{r_H} \psi_1 \psi_2 \psi_3 \psi_4 dV = 2G \iiint_0^{r_H} \psi_1 \psi_2 \frac{1}{v^{1/2}} \frac{1}{v^{1/2}} V$$

$$\equiv \iiint_0^{r_H} \psi_1 \psi_2 G \equiv \iiint_0^{r_H} \psi_1 \psi_2 (2m_e c^2) dV_{rH} = \iiint_0^{V_{rH}} \psi_1 (2m_e c^2) \psi_2 dV_{rH} \quad (A8)$$

Object C adds its own spin (eg., as in 2nd derivative eq.A1) to the electron spin (1,IV quadrants) and the W associated with the $2P_{3/2}$ state at $r=r_H$ thereby adds a derivative in a neutrino quadrant (fig.4) thereby including neutrinos in the Fermi 4pt. So 2nd derivative

$$\Sigma((\gamma^\mu \sqrt{\kappa_{\mu\mu}} dx_\mu) - i\kappa)(\gamma^\nu \sqrt{\kappa_{\nu\nu}} dx_\nu + i\kappa)\chi = \Sigma((\gamma^\mu \sqrt{\kappa_{\mu\mu}} dx_\mu) - i\kappa)\psi \text{ so } \frac{1}{2}(1 \pm \gamma^5)\psi = \chi. \quad (A9)$$

In that regard the expectation value of γ^5 is speed and varies with $e^{i3\phi/2}$ in the trifolium. The spin $^{1/2}$ decay proton $S_{1/2} \propto e^{i\phi/2} \equiv \psi_1$, the original ortho $2P_{1/2}$ particle is chiral $\chi = \psi_2 \equiv \frac{1}{2}(1 - \gamma^5)\psi = \frac{1}{2}(1 - \gamma^5 e^{i3\phi/2})\psi$. Initial $2P_{1/2}$ electron ψ is constant. Start with initial ortho state χ . These γ^5 terms then

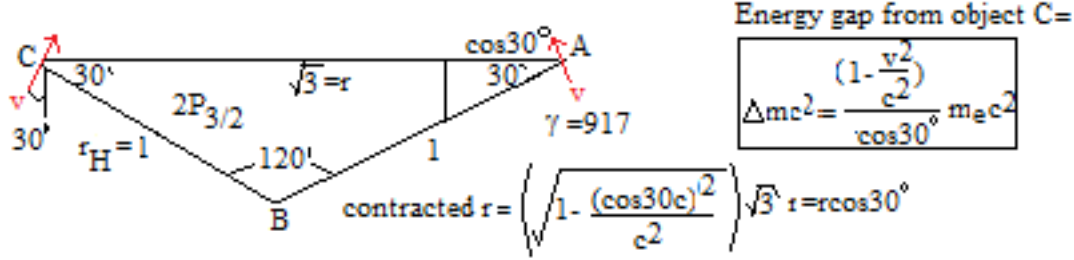
$$\text{modify equation A8 to read } = \iiint_0^{V_{rH}} \psi_1 \psi_2 (2m_e c^2) dV_{rH} = \iint \psi_{S1/2}^* (2m_e c^2 V_{rH}) \chi dV_\phi =$$

$$K \int \langle e^{i\frac{\phi}{2}} [\Delta\varepsilon V_{rH}] (1 - \gamma^5 e^{i\frac{3\phi}{2}}) \psi \rangle d\phi = K G_F \int \langle e^{i\phi/2} - \gamma^5 e^{i(4/2)\phi} \rangle d\phi = K G_F \left(\frac{2e^{i\phi}}{i} \Big|_0^{2\pi+C} - \frac{2\gamma^5 e^{i4\phi}}{i4} \Big|_0^{2\pi+C} \right) = k(1/4 + i\gamma^5) = k(.225 + i\gamma^5 0.974) = k(\cos 13^\circ + i\gamma^5 \sin 13^\circ) \text{ deriving the } 13^\circ \text{ Cabbibo angle.}$$

With previously mentioned CP result (direct evidence of fractal universe) get CKM matrix

C7 Object C Effect on Inertial Frame Dragging and G_F found by using eq.C8 again (N=1 ambient cosmological metric)

Review of $2P_{3/2}$ Next higher fractal scale ($X10^{40}$), cosmological scale. Recall from B9 $m_e c^2 = \Delta\varepsilon$ is the energy gap for object B vibrational stable eigenstates of composite $3e$ (vibrational perturbation r is the only variable in Frobenius solution, part II Ch.8,9,10) proton. Observer in object A. $\Delta m_e c^2$ gap = object C scissors eigenstates. is what we see at object A but $\Delta m_e c^2$ gets boosted by γ by rotation into the object B direction. (to compare with the object B $m_e c^2$ gap).



From fig 7 $r^2=1^2+1^2+2(1)(1)\cos 120^\circ=3$, so $r=\sqrt{3}$. Recall for the positron motion $\gamma = \frac{1}{\sqrt{1-\frac{v^2}{c^2}}}=917$.

So start with the distances we observe which are the Fitzgerald contracted $AC=$

$r_{CA}=1\sqrt{1-\frac{\cos^2 30^\circ c^2}{c^2}}\sqrt{3}=.866=\cos 30^\circ=CA$ and Fitzgerald contracted $AB=r_{BA}=x/\gamma=1/\gamma$ so for Fitzgerald contracted $x=1$ for AB (fig7). We can start at $t=0$ with the usual Lorentz transformation for the time component.

$$t'=\gamma(ct-\beta x)=kmc^2.$$

since time components are Lorentz contracted proportionally also to mc^2 , both with the γ multiplication.

In the object A frame of reference we see $\Delta m_e c^2$ which is the average of left and right object C motion effect. We go into the AB frame of reference to compare the object B $m_e c^2$ with this $\Delta m_e c^2$. Going into the AB frame automatically boosts $\Delta m_e c^2$ to $\gamma\Delta m_e c^2$. So start from a already Fitzgerald contracted x/γ . Next do the time contraction γ to that frame:

$$t'' = k\gamma\Delta m_e c^2 = \gamma\beta r_{AB} = \gamma\beta\left(\frac{x}{\gamma}\right) = \frac{1}{\sqrt{1-\frac{v^2}{c^2}}}\beta\left(\sqrt{1-\frac{v^2}{c^2}}\sqrt{1}\right) = \beta$$

with k defining the projection of tiny $\Delta m_e c^2$ "time" CA onto BA = $\cos\theta$ = projection of BA onto CA. But $m_e c^2$ is the result of object B of both of the motion and inertial frame dragging reduction (D9) so its γ is large. To make a comparison of ΔE to AB mass $m_e c^2$ CA is rotated and translated to the high speed AB direction and distance with its large γ so thereby *object C becomes mathematically object B* with the same k because of these projection properties of: CA onto BA. So we define projection k from projection of $m_e c^2$: So again

$$t'=\gamma(ct-\beta x)=kmc^2=t'=km_e c^2 = \gamma\beta r_{CA} = \left(\frac{1}{\sqrt{1-\frac{v^2}{c^2}}}\right)\beta\left(\sqrt{1-\frac{\cos^2 30^\circ c^2}{c^2}}\sqrt{3}\right) = \gamma\beta\cos 30^\circ$$

Take the ratio of $\frac{k\gamma\Delta m_e c^2}{km_e c^2}$ to eliminate k : thus

$$\frac{k\gamma\Delta m_e c^2}{km_e c^2} = \frac{\gamma\beta\left(\frac{x}{\gamma}\right)}{\gamma\beta r_{CA}} = \frac{1\beta 1}{\gamma\beta\cos 30^\circ} = \frac{1}{\gamma\cos 30^\circ} \quad \text{so}$$

$$\Delta m_e c^2 = \frac{\beta m_e c^2}{\beta\cos 30^\circ\gamma^2} = \frac{\left(1-\frac{v^2}{c^2}\right)m_e c^2}{\cos 30^\circ} \quad \text{(A10)}$$

allowing us to finally compare the energy gap caused by object C ($\Delta m_e c^2$) to the energy gap caused by object B ($m_e c^2$, C8). So to summarize $\Delta E=(m_e c^2/((\cos 30^\circ)917^2))=m_e c^2/728000$. So the energy gap caused by object C is $\Delta E=(m_e c^2/((\cos 30^\circ)917^2))=m_e c^2/728000$. The weak interaction thereby provides the ΔE perturbation ($\int \psi^* \Delta E \psi dV$) inside of r_H creating those Frobenius series (partII) $r \neq 0$ states, for example in the unstable equilibrium $2P_{1/2}$ electrons m_e . so in the context of those e, ν rotations giving W and Z_0 . The G can be written for E&M decay as

$(2mc^2)XV_{rH} = 2mc^2 [(4/3)\pi r_H^3]$. But because this added object C rotational motion is eq.A9 Fermi 4 point it is entirely different than a mere 'weak' E&M. So for weak decay from equation A8 it is $G_F = (2m_e c^2 / 728,000) V_{rH} = G_F = 1.4 \times 10^{-62} \text{ J}\cdot\text{m}^3 = .9 \times 10^{-4} \text{ MeV}\cdot\text{F}^3$ **the strength of the Fermi 4pt weak interaction constant** which is the coupling constant for the Fermi 4 point weak interaction integral. Note $2m_e c^2 / 729,000 = 1.19 \times 10^{-19} \text{ J}$. So $\Delta E = 1.19 \times 10^{-19} / 1.6 \times 10^{-19} = .7 \text{ eV}$ which \pm that r perturbation (instability) states in the Frobenius solution (partII) and so weak decay. interaction integral. Note $2m_e c^2 / 729,000 = 1.19 \times 10^{-19} \text{ J}$. So $\Delta E = 1.19 \times 10^{-19} / 1.6 \times 10^{-19} = .7 \text{ eV}$ which is our ΔE gap for the weak interaction (from operator H) inside the Fermi 4pt. integral for G_F .

The perturbation r in the Frobenius solution is caused by this ΔH in $(\int \psi^* \Delta H \psi dV)$ with available phase space $\psi^* = \psi_p \psi_e \psi_\nu$ for $\psi = \psi_N$ decay where ψ_e and ψ_ν are from the factorization. The neutrino adds a $e^2(0)$ to the set of $e^2 10^{40N}$ electron solutions to Newpde r_H with electron charge $\pm e$ and intrinsic angular momentum conservation laws $S=1/2$ holding for both e and ν .

The neutrino mass increases with nonisotropic homogenous space-time (sect.3.1 and our direction of motion here) whereas that Kerr metric $(a/r)^2$ term (B9) in general is isotropic and homogenous and so only effects the electron mass.

C8 NONhomogeneous and NONisotropic Space-Time

Recall 2D N=1 and that 2D N=0 (perturbation) orientations are not correlatable so we have $2D+2D=4D$ degrees of freedom. But this is all still embedded in the same complex (2D) plane. So this theory is still geometrically complex 2D Z then. Recall the $\kappa_{\mu\nu} = g_{\mu\nu}$ metrics (and so R_{ij} and R) were generated in section 1.

In that regard for 2D for a homogenous and isotropic g_{ij} we have identically $R_{\mu\mu} - 1/2 g_{\mu\mu} R = 0$ (3.1.1) \equiv source $= G_{00}$ since in 2D $R_{\mu\mu} = 1/2 g_{\mu\mu} R$ identically (Weinberg, pp.394) with $\mu=0, 1, \dots$ Note the 0 ($=E_{\text{total}}$ the energy density source) and we have thereby proven the existence of a net zero energy density vacuum. Thus our 2D theory implies the vacuum is really a vacuum! It is then the result of the fractal and 2D nature of space time!

A ultrarelativistic electron is essentially a transverse wave 2D object (eg., the $2P_{1/2}$ electron in the neutron). In a isotropic homogenous space time $G_{00}=0$. Also from sect.2 eqs. 7 and 8 (9) occupy the same complex 2D plane. So eqs. 7+8 is $G_{00} = E_e + \sigma \cdot p_r = 0$ so $E_e = -\sigma \cdot p_r$

So given the negative sign in the above relation the **neutrino chirality is left handed**.

But if the space time is not isotropic and homogenous then G_{00} is not zero and the **neutrino gains mass**.

C9 Derivation of the Standard Electroweak Model from Newpde but with No Free parameters

Since we have now derived M_W, M_Z and their associated Proca equations, and Dirac equations for m_τ, m_μ, m_e etc., and G, G_F, ke^2 Maxwell's equations, etc. we can now write down the usual Lagrangian densities that implies these results. In the formulation $M_Z = M_W / \cos\theta_W$ you can find the Weinberg angle θ_W , $g \sin\theta_W = e$, $g' \cos\theta_W = e$; solve for g and g', etc., We will have thereby derived the standard model from first principles (i.e. postulate 0). **It no longer contains free parameters.**

Note $C_M = \text{Figenbaum pt}$ really is the U(1) charge and equation 16 rotation is on the complex plane so it really implies SU(2) (C1) with the sect.1.2 2D eqs. 7+8 $= G_{00} = E_e + \sigma \cdot p_r = 0$ gets the left handedness. Recall the genius of the SM is getting all those properties (of χ, Z_0, W^+, W^-) from SU(2)XU(1)_L so we really have completely derived the electroweak standard model from eq.16

which comes out of the Newpde given we even found the magnitude of its input parameters (eg., G_F (appendix C7), Cabbibo angle C6).

Appendix D Counting actual quanta numbers N (instead of just n energy level 2nd quantization states |n>)

D1 Recall from equation 11 $\left[\left(\frac{dr+dt}{ds}\right)\right] \delta Z = \frac{ds}{ds} \delta Z = (1)\delta Z$ In that “implied iteration of the first application $\left[\left(\frac{dr+dt}{ds}\right) + \left(\frac{dr+dt}{ds}\right)\right] \delta Z = 2 \frac{ds}{ds} \delta Z = 2(1)\delta Z$ For all the rotations in fig.4 (except the eq.11 IVth to Ist quadrants: in eq.6.1 each quadrant rotation provides one derivative for each ν) $\left[\left(\frac{dr+dt}{ds}\right) + \left(\frac{dr+dt}{ds}\right)\right] \delta Z = 2 \frac{ds}{ds} \delta Z = 2(1)\delta Z$. Equation 11 (sect.1) then counts units N of each 2 half integer $S=1/2$ angular momentums=1 unit oelectrons (spin1 for W and Z) off the light cone. For the rotation in the eq.11 IVth to Ist quadrants (each quadrant rotation provides one derivative for each ν) at 45° $dr=dt$ (on the light cone in fig.4) so for Hamiltonian H: $2H\delta z=2(dt/ds)\delta z = 2(1/2)\delta z = (1)\hbar\omega\delta z = \hbar k\delta z$ on the diagonal so that $E=p_i\hbar\omega$ for the two ν energy components, universally. Thus we can state the most beautiful result in physics that $E=Nhf$ for the energy of light with N equal N monochromatic photons. Thus this eq.11c counting N does not require the (well known) quantization of the E&M field with SHM (sect.6.10 below). Which seemed to me at least a adhoc process on the face of it since the Maxwell equations have nothing to do with SHM.

Given this comes from equation 11, these numbers are thereby “observables”. We have come full circle, getting eq.11 ‘observables’ and using equation 11 to define our inputs into the ‘1’ in $1=1+0, 1=1X1, 0=0X0$ as an observable (Newpde electrons), thereby starting our entire derivation all over again..

All defined numbers, and resulting symbols and rules, that are larger than 1 ($N>1$) we define as “applications” given our ultimate Occam’s Razor attribute of the postulate of 0. Note applications can be arbitrarily complicated.

D2 Postulate 0 also implies the underlying 1,0 relationship and $n>1$ “applications”

Review Postulate 0: No need for a complicated definition because there is nothing there to define! The null set would be simpler and ultimate occam's razor but you don't postulate it, since it is subset of every set anyway.

So by the process of elimination we arrive at the ultimate Occam's razor *postulate* real#0, the very next level up.

But we need to define the algebra first and use it to write the postulate0. So define

1) *numbers* $1 \equiv 1+0$ and $0 \equiv 0X0, 1 \equiv 1X1$ as *symbol* $z=zz$: the *simplest* algebraic definition of 0. So
 2) **Postulate** real number 0 if $\underline{z}'=0$ and $\underline{z}'=1$ plugged into $z'=z'z'+C$ (**eq.1**) results in *some* $C=0$ constant (ie $\delta C=0$).

This is our *entire* (Ultimate Occam’s Razor **postulate(0)**) *theory*

Application: (i.e., *plug* $z=1,0$ into eq.1 as required by above theory.)

Plug in $z=0=z_0=z'$ in eq1. The equality sign in eq.1 demands we substitute z' on left (**eq1**) into right z'/z' repeatedly and get iteration $z_{N+1}=z_N z_N + C$. If $C=1$ and $z_N=1$ then $z_{N+1}=2$. If $C=2$ and $z_N=1$ then $z_{N+1}=3$, etc., . So the *numbers* z_N possibly are larger than 1 so the larger $1+1 \equiv 2, 1+2 \equiv 3$, etc (*defined* to be $a+b=c$) and define rules of algebra on these *numbers* like $a+b=b+a$ (eg., ring-field) with no new axioms. So postulate 0 also *generates* the big *numbers* and thereby the algebra we can now use:

If we state different rules than the standard ring-field algebra rules we still get the same physics but using these different math rules in the physics laws.

Postulate 1 also gets us set theory. For example $1 \cup C \equiv 1 + C$ (If $A \cap B = \emptyset$). with algebraic definition of $1 = z = zz$ having both 1,0 as solutions so defining negation \sim with $0 = 1 - 1$. Thus we can define intersection \cap with $\sim((A \cup B) \sim B \sim A) \equiv A \cap B$. So we have defined both union \cup and intersection \cap so we have derived set theory.

So in postulate 1 $z = zz$ why did 0 come along for the ride? The deeper reason in set theory is that \emptyset is an element of every set. Note \emptyset and 0 aren't really new postulates since they postulate literally "nothing". So we just derived set theory from the postulate of 1.

Relationship between 0 and \emptyset

The null set \emptyset is the subset of every set. In the more fundamental set theory formulation, \emptyset is not a real number so \emptyset and 0 are not the same. But {some of the properties overlap such as $\emptyset \subset \{\text{all sets}\} \Leftrightarrow \{0\} \subset \{1\}$ since $\emptyset = \emptyset \cup \emptyset \Leftrightarrow 0 = 0 + 0 = 0$, $\{\{1\} \cup \emptyset\} = \{1\} \Leftrightarrow 1 + 0 = 1$.

So list $1 \cup 1 \equiv 1 + 1 \equiv 2$, $2 \cup 1 \equiv 1 + 2 \equiv 3$, ... all the way up to 10^{82} (as an "application" so we haven't violated Ocam's razor. See Fiengenbaum point) and define all this list as $a + b = c$, etc., to create our algebra and numbers (rings^fields) which we use to write equation 1 $z = zz + C$, $\delta C = 0$ for example.

D2 Alternative ways of adding 2D+2D→4D

Recall from section 1 that adding the N=0 fractal scale 2D δz perturbation to N=1 eq.7 2D gives curved space 4D. So $(dx_1 + idx_2) + (dx_3 + idx_4) \equiv dr + idt$ given (eqs5,7a) $dr^2 - dt^2 = (\gamma^r dr + i\gamma^t dt)^2$ if $dr^2 \equiv dx^2 + dy^2 + dz^2$ (3D orthogonality) so that $\gamma^r dr \equiv \gamma^x dx + \gamma^y dy + \gamma^z dz$, $\gamma^i \gamma^i + \gamma^j \gamma^j = 0$, $i \neq j$, $(\gamma^i)^2 = 1$, rewritten (with curved space $\kappa_{\mu\nu}$ eq.14-17)

$$(\gamma^x \sqrt{\kappa_{xx}} dx + \gamma^y \sqrt{\kappa_{yy}} dy + \gamma^z \sqrt{\kappa_{zz}} dz + \gamma^t \sqrt{\kappa_{tt}} idt)^2 = \kappa_{xx} dx^2 + \kappa_{yy} dy^2 + \kappa_{zz} dz^2 - \kappa_{tt} dt^2 = ds^2.$$

But there are alternatives to this 3D orthogonalization method. For example satisfying this 4D Clifford algebra and complex orthogonalization requirement is a special case of any 2 $x_i x_j$ in eq.3 (directly from postulate1): Imposing orthogonality thereby creates 6 pairs of eqs.3&5. So each particle carries around it's own $dr + idt$ complex coordinates with them on their world lines.

Alternatively this 2D $dr + idt$ is a 'hologram' 'illuminated' by a modulated $dr^2 + dt^2 = ds^2$ 'circle' wave (as 2nd derivative wave equation operators from eq.11 circle) since 4Degrees of freedom are imbedded on a 2D (dr, dt) surface here, with observed coherent superposition output as eq.16 solutions. A more direct way is to simply write the 4Degrees of freedom on the 2D surface as $dr + idt = (dr_1 + idt_1) + (dr_2 + idt_2) = (dr_1, \omega dt_2), (dr_2, idt_2) = (x, z, y, idt) = (x, y, z, idt)$, where $\omega dt \equiv dz$ is the z direction spin $^{1/2}$ component ω (angular velocity) axial vector of the Newpde lepton (eqs.7-9); which we get anyway from lepton equation Newpde.

N=-1 and dimensionality

Note the N=-1 (GR) is yet another δz perturbation of N=0 $\delta z'$ perturbation of N=1 observer thereby adding at least 1 independent parameter dimension to our $dx_1 + (dx_2 + idx_3) + (dx_4 + idx_5)$ (4+1) explaining why Kaluza Klein 5D $R_{ij} = 0$ works so well: so GR is really 5D if E&M (N=0) included. Note these N=-1 fractal scale wound up balls at $r_H = 10^{-58}m$ are a lot smaller than the Planck length. But if only N=1 observer and N=-1 are used (no N=0) we still have the usual 4D GR Einstein equations. Recall the dx_1 (N=-1) is gravity.

D3 We can isolate lemniscate Mandelbrot Set implied by the perfect circle (eq.11) observability if also 4X circles included.

In section 1 we got the Circle $dr^2+dt^2=ds^2$ and so *observability* of eq.11. So including observability *only* we could have instead postulated $1^2=1^21^2$ or $C_{N+1}=C_N C_N+C$. $C=C_1=dr^2+dt^2$, $C_0=0$ instead of the more general $z=zz$ ($1=1X1$) implying $z_{N+1}=z_N z_N+C$. This gets the lemniscate sequence and so just the bare bones Mandelbrot set without all the flourishes of the smaller scale versions of $z_{N+1}=z_N z_N+C$

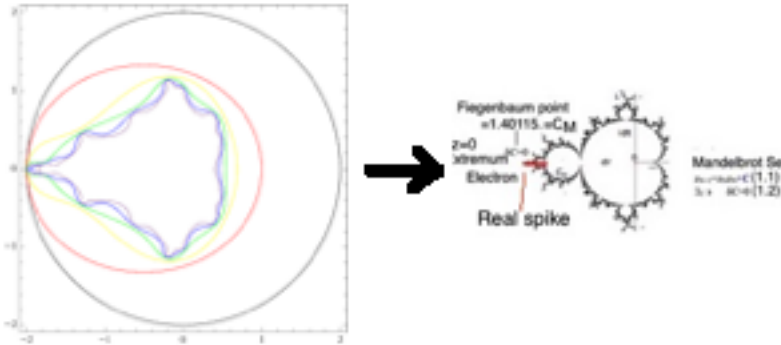


fig7 Lemniscate sequence (Wolfram, Weisstein, Eric) $C_{N+1}=C_N C_N+C$. $C=C_1=dr^2+dt^2$, $C_0=0$. After an infinite number of successive approximations $C''=C'C'+C=C_M^2$

Mandelbrot calls C_M the ER, Escape Radius (see Muency).

Note then *observability* thereby implies *only* the basic Mandelbrot set structure and so not all the other parts, the flourishes, of that zoom.

But the $\delta C=0$ extreme additionally imply states whose life times are long enough to be observable and those are at the $\delta C=0$ extreme of the (observably) 4X circles Feigenbaum point,

Δ Modification of Usual Elementary Calculus ϵ, δ ‘tiny’ definition of the limit.

Recall that: given a number $\epsilon > 0$ there exists a number $\delta > 0$ such that for all x in S satisfying

$$|x-x_0| < \delta$$

we have

$$|f(x)-L| < \epsilon$$

Then write $\lim_{x \rightarrow x_0} f(x) = L$

Thus you can take a smaller and smaller ϵ here, so then $f(x)$ gets closer and closer to L even if x never really reaches x_0 . ‘Tiny’ for $h \rightarrow L_1$ and $f(x+h)-f(x) \rightarrow L_2$ then means that $L=0=L_1$ and L_2 . ‘Tiny’ is this difference limit.

Hausdorff (Fractal) s dimensional measure using ϵ, δ

Diameter of U is defined as $|U| = \sup\{|x-y|: x, y \in U\}$. $E \subset \cup_i U_i$ and $0 < |U_i| \leq \delta$

$$H_\delta^s(E) = \inf \sum_{i=1}^{\infty} |U_i|^s$$

analogous to the elementary $V=U^s$ where of $s=3$, $U=L$ then V is the volume of a cube $\text{Volume}=L^3$. Here however ‘s’ may be noninteger (eg., fractional). The volume here would be the respective Hausdorff outer measure.

The infimum is over all countable δ covers $\{U_i\}$ of E .

To get the Hausdorff outer measure of E we let $\delta \rightarrow 0$ $H^s(E) = \lim_{\delta \rightarrow 0} H_\delta^s(E)$

The restriction of H^s to the σ field of H^s measurable sets is called a Hausdorff s -dimensional measure. $\dim E$ is called the Hausdorff dimension such that

$$H^s(E) = \infty \text{ if } 0 \leq s < \dim E, \quad H^s(E) = 0 \text{ if } \dim E < s < \infty$$

So if s implies a zero H or infinite H it is not the correct dimension. This rule is analogous to the definition of the (fractal) Mandelbrot set itself in which a C that gave infinity is rejected by the definition $\delta C = 0$ we can model as a binary pulse ($z = zz$ solution is binary $z = 1, 0$) with

$zz = z(1)$ is the algebraic definition of 1 and can add real constant C (so $z' = z'z' - C$, $\delta C = 0$ (2)), $z \in \{z'\}$

Plug $z' = 1 + \delta z$ into eq.2 and get
$$\delta z + \delta z \delta z = C \tag{3}$$

so
$$\delta z = (-1 \pm \sqrt{1 + 4C}) / 2 = dr + idt \tag{4}$$

for $C < -1/4$ so real line $r = C$ is immersed in the complex plane.

$z = z_0 = 0$ To find C itself substitute z' on left (eq.2) into right $z'z'$ repeatedly & get $z_{N+1} = z_N z_N - C$. $\delta C = 0$ requires us to reject the C s for which

$-\delta C = \delta(z_{N+1} - z_N z_N) = \delta(\infty - \infty) \neq 0$. **$z = zz$ solution is 1, 0** so initial

gets the **Mandelbrot set** C_M (fig2) out to some $\|\Delta\|$ distance from $C = 0$. Δ found from $\partial C / \partial t = 0$, $\delta C \equiv \delta C_r = (\partial C_M / \partial (dr dt)) dr = 0$ extreme giving the Feigenbaum point $\|C_M\| = \|-1.400115..\|$ global max given this $\|C_M\|$ is biggest of all.

If s is not an integer then the dimensionality it is has a fractal dimension.

But because the Feigenbaum point Δ uncertainty limit is the r_H horizon, which is impenetrable (sect.2.5, part I), ϵ, δ are not dr/ds eq.11a observables for $0 < \epsilon, \delta < r_H$. Instead $\epsilon, \delta > \Delta = r_H =$ the next $10^{40} \times$ smaller fractal scale Mandelbrot set at the Feigenbaum point.

Review Recall from eq.7 that $dr + dt = ds$. So combining in quadrature eqs 7&11

$SNR \delta z = (dr/ds + dt/ds) \delta z = ((dr + dt)/ds) \delta z = (1) \delta z$ (11c, append) and so having come *full circle* back to postulate 1 as a real eigenvalue ($1 \equiv$ Newpde electron). For all the rotations in fig.4 (except the eq.11 IVth to Ist quadrants: in eq.B1 each quadrant rotation provides one derivative for each ν

$\nu \left[\left(\frac{dr + dt}{ds} \right) + \left(\frac{dr + dt}{ds} \right) \right] \delta z = 2 \frac{ds}{ds} \delta z = 2(1) \delta z$ Equation 11 (sect.1) then counts units N of each 2 half integer $S = 1/2$ angular momentums $= 1 = 2$ units of electrons (spin 1 for W and Z) off the light

cone. Alternatively diagonal $ds = \sqrt{2} dr$ in $\int \left(\frac{dr}{\sqrt{2} dr} + \frac{dr}{\sqrt{2} dr} \right)^2 dV = 1$ For the rotation in the eq.11

IVth to Ist quadrants (each quadrant rotation provides one derivative for each ν) at 45° $dr = dt$ (on the light cone in fig.4) so for Hamiltonian $H: 2H \delta z = 2(dt/ds) \delta z = 2(1/2) \delta z = (1) \hbar \omega \delta z = \hbar c k \delta z$ on the

diagonal so that $E = p_r = \hbar \omega$ for the two ν energy components, universally. Thus we can state the most beautiful result in physics that $E = N \hbar f$ for the energy of light with N equal N

monochromatic photons. Replaces 2nd quantization of 2 given allowed Newpde 10^{82}

electrons (appendix A2) So we really do have a binary physics signal. So, having come *full circle* then: **(postulate 0 \leftrightarrow Newpde)**

Digital communication analogy: Binary ($z = zz$) 1, 0 signal with white noise $\delta C = 0$ in $z' + C = z'z'$.

Recall the algebraic definition of 1 is $z = zz$ which has solutions 1, 0. (11c). Boolean algebra. Also you could say white noise C has a variation of zero ($\delta C = 0$) making it easy to filter out (eg., with a Fourier cutoff filter).

So you could easily make the simple digital communication analogy of this being a binary ($z = zz$) 1, 0 signal with white noise $\delta C = 0$ in $z' + C = z'z'$. (However the noise is added a little differently here ($z + C = zz$) than in statistical mechanics signal theory (eg., There you might use deconvolved signal = convolution integral [(transfer function) signal] dA)). where the'

signal' actually would equal $z+C$, not the usual $(2J_1(r)/r)^2$ psf So this is not quite the same math as in signal theory statistics statistical mechanics.)

The Whole Shebang:

This theory is 0

Postulate real number **0** if $z'=0$ and $z'=1$ plugged into $z'=z'z'+C$ (**eq.1**) results in some $C=0$ constant (ie $\delta C=0$)

Plug 0 into **eq.1** and get the Mandelbrot set

Plug 1 into **eq.1** and get the Dirac eq.

Dirac plus Mandelbrot gets the Newpde

So Ultimate Occam's razor postulate(**0**) implies ultimate math-physics

So this theory is **0**. Hold that thought.