Define Real Observable 1

Abstract DEFINITION OF REAL OBSERVABLE 1

postulate real observable 1

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list-define math (from 1, sect.4)

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z=zz algebraic definition of 1 is the small C limit of
z=zz+C, δC=0,C<0 (1) needed to define real observable 1

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Plug left side z of eq.1 into right side zz repeatedly and use δC=0 and get **Mandelbrot set** iterations from z_o=1 Cauchy seq subset generates real# 1 Fiegenbaum pt. subset from Clifford alg	Plug z=1+δz into eq.1 and get: **δ(δz+δzδz)=0** Im=Clifford Alg, Real=SR→ *operator* formalism so **Dirac eq.**(flat space)

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new pde psi $\gamma^{\mu}\sqrt{(\kappa_{\mu\mu})}\partial\psi/\partial x_{\mu}=(\omega/c)\psi$ (Curved space, Generally covariant, fractal) .

The ((dr+dt)/ds)ψ=1ψ=-iħdψdr+iħdψ/dct Hermitian *operator* on this ψ defines **observable**1

Note all we did here was to *define* real observable 1.

But by writing out this definition we also inadvertently derived *both* real# math and physics from the **postulate** of 1. (Backups at davidmaker.com)

1)Introduction

1 is the simplest idea imaginable. But 1 is not just a squiggle written on a piece of paper. For the **postulate** of 1 to be meaningful and tangible 1 must be real observable: an idea everyone can understand. So all I did then was to define **real observable 1**.

Note real (i.e., Cauchy seq.of rational #) and observable (i.e.,Hermitian operator on ψ) are rigorously defined and so the resulting new pde ψ is rigorously derived.

Summary: **Postulate** 1 (and get math and physics).

2) **Details of above derivation of the new pde that defines real observable**

So we just **postulate 1**, the simplest idea imaginable, and then use that list-define method , that uses this 1, to develop the algebra tools(sect.4) we need to define real observable. In that regard the simplest algebraic definition of 1,0 is z=zz which is the small C limit of

z=zz+C, δC=0, C<0 (1)

needed to define real **observable** 1.

(A) Substitute **z**=1+δz into eq.1 and get δ(δz+δzδz)=0 (2). (gets Dirac eq. "*observables*")

(B) Substitute the left side **z** of z =zz+C back into the right side zz of eq.1 repeatedly and use δC=0 and get the Mandelbrot set (fractal) iteration formula for some C_M.(containing subsets of Cauchy sequences for *real*#). Other substitutions into eq.1 than A&B do not lead to "real" to*'real*' '*observable'*. Other substitutions into eq.1 than A&B do not lead to *'real*' '*observable'*

2.1 Derivation of new pde

(A)So from eq.2 (δz-K)+$\delta z\delta z$=C (constant C and K) which is a quadratic eq. with in-general complex solution $\delta z=dr+idt$. Plug that back into eq.2 with $K=\delta z$ to initialize to flat space and get $\delta(dr^2+i(drdt+dtdr)-dt^2)=0$ since $dr^2-1^2dt^2=ds^2$ is special relativity (Minkowski metric given 1^2=natural unit constant speed$^2\equiv c^2$) invariance. The imaginary extremum is the Clifford algebra $dr'dt'+dt'dr'=\gamma^r dr\gamma^t dt+\gamma^t dt\gamma^r dr=0$ since $2drdt\neq 0$ here for NONvacuum. Factor the real component and get 5 equations (eg.,**e**; dr+dt=ds,dr-dt=ds (3),etc.,dr-dt in IV quadrant so ds>0. e=electron=only nonzero proper mass. (Complex *unknown* K for $K\neq\delta z+\delta z'$ ($\delta z'$)perturbation adds 2 degrees of freedom.). **We just derived special relativity here!**

Square eq.3 to get $+ds^2=(dr+dt)^2=(dr^2+dt^2)+drdt+dtdr$ implying $dr^2+dt^2=ds^2$ circle invariance at 45° since dr+dt and drdt+dtdr (cross term) are invariant. So $\delta z=dse^{i\theta}=dse^{i((\sin\theta dr+\cos\theta dt)/ds)}$. Take the r derivative, define $dr/ds\equiv k$, $\sin\theta\equiv r$, $\delta z\equiv\psi$ and multiply both sides by $i\hbar$ and define momentum $p\equiv\hbar k\equiv\xi v$ to get the operator formalism $p_r\psi=-i\hbar\partial\psi/\partial r$ (so *observables* p). All three invariances imply the Dirac equation for **e**,*v*. **We just derived quantum mechanics here**! Clifford algebra small drdt area extremum is then the real# line drdt Mandelbulb Fiegenbaum pt. C_M. on the *real* axis.were the Mandelbrot iteration sequence has that Cauchy seq.subset. giving the real numbers. Postulate 1 (eq.1) then requires a new (boost) frame of reference to give small fractal baseline $\delta z'\equiv C_M/\gamma\equiv C_M/\xi\equiv r_H$=C. So $K\neq\delta z+\delta z'$ perturbation of flat space eq.3: $(dr-\delta z')+(dt+\delta z')=ds\equiv dr'+dt'$ rotation (3) since ds invariant. Defining $\kappa_{rr}\equiv(dr/dr')^2=1/(1-r_H/r)+.$, $r\equiv dr$, in the Minkowski metric $ds^2=dr'^2+dt'^2+.$,and using invariance $drdt=dr'dt'=\sqrt{\kappa_{rr}}dr\sqrt{\kappa_{tt}}dt$, we obtain $\kappa_{rr}=1/\kappa_{tt}$ and thereby **get 4D GR** math. So the Fiegenbaum point neighborhood perturbation rotations θ and Dirac equation give that **new pde** $\gamma^\mu\sqrt{(\kappa_{\mu\mu})}\partial\psi/\partial x_\mu=(\omega/c)\psi$ with that fractal r_H (by10^{40}X scale change). Hermitian operators on these new pde ψs are the observables.

3) Applications Of The New pde

That *new pde* z=0 composite e,*v* implies the Z,$W^\pm$,γ , the 4 Bosons of the Standard electroweak Model SM (PartI) and so **Maxwell's equations** and **Proca** equation. *New pde z=0* $2P_{3/2}$ composite **3e** results in rapid e motion Fitzgerald contraction of E field lines giving the **strong force** and so (the much larger mass) **baryons**.(partII). The iteration of the new pde on the next higher fractal scale generates the Schwarzschild metric (i.e.**, gravity**) and so general covariance. So **we just derived general relativity (GR) from quantum mechanics in one line!** Recall the *new pde* zitterbewegung oscillation on the next higher fractal scale. With us being in the expansion stage of the oscillation for $r<r_c$ this then **explains the expansion of the universe**. Many *new pde* experimentally testable predictions (eg., differential cross-section peak for 21Tev p-p collisions, totem results,..etc..,) are contained in partI, partII, partIII.

3.1) Note The Square Root In New pde $\gamma^\mu\sqrt{(\kappa_{\mu\mu})}\partial\psi/\partial x_\mu=(\omega/c)\psi$

For z=1 the 3rd order term in the Taylor expansion of the two square roots $\sqrt{\kappa_{\mu\mu}}$ in the *new pde* gets the Lamb shift (2) and anomalous gyromagnetic ratio respectively thus eliminating the need for renormalization and the resulting infinite charge, infinite mass, infinite vacuum density, etc.. Thus these square roots **cause theoretical physics to give right answers again** (Infinite everything is 0% right

4) **Real Analysis From Only The Postulate 1**

Recall one of our two goals was to define the real numbers from one simple postulate1. To do that we had to define real observable 1. Here we mention the details of developing the algebra (eg.,required for eq.1) such as the list-define method (in the above flow chart).
Given this (postulate) 1 we can use *list-define* (*list* the many instances of a relation e.g., start with **1**∪1≡ 2 , then *define* them all as relation a+b=c) math(appendix C PartI) to *replace* those famous order axioms, mathematical induction axioms (giving **N**) and the field and ring axioms to generate the numbers N and the algebra of eq.1. Also the (postulate of 1) restatement: $z=zz+C, \delta C=0, C<0$. (eq.1) is the same as min(**z-zz**)>0. So the well known (axiom of) completeness ∃**min**sup is provided by the **min** and the (axiom of) "choice" function is f(z)=**z-zz**. We thereby demonstrate that we get the (also required) Completeness and Choice(1) as well from the postulate of 1. Also, as we saw, by plugging in the left side z into the zz of the right side of eq.1(which also comes from the **postulate** of 1 via the *list-define* method) repeatedly and use that $\delta C=0$ we generate the Mandelbrot set iteration from $z_o=1$ and also a Cauchy sequence of rational numbers that generates the real number 1.
Here we thereby have that simplest imaginable idea of postulate 1 generating *only* the real number mathematics and observable physics (e.g.,we got 4D) *without* any other postulates! Otherwise we would also have those many axioms of mathematics to account for as well. 1 is *THE* single Occam's razor postulate meaning we have 'figured it out', Jackpot! (i.e., as in sect.3)

Conclusion: Intuitive notion of the **Postulate** of ONE.

Given the fractalness astronomers are observing from the inside of what particle physicists are studying from the outside, the r_H of that ONE *new pde 'object'* we first postulated. So we look at big and small scales and all we see is that **ONE** nonzero proper mass e (even baryons are 3**e**).

References

(1) Royden, '**Real Analysis',** Pearson modern classics
(2) Bjorken and Drell, '**Relativistic Quantum Fields'**