PartIII

Fractal Quantum Mechanics $\kappa_{oo}=g_{oo}$

Review

Where does this 'Newpde' come from? Answer: from the Occam's razor*
postulate 1 (as an observable, so noised C)

z=zz (eq2) algebraically defines **1**,**0** with added constant C (δC=0) is z'=z'z'+C (**eq1**) with some C=0 (thus postulate of 1).The rest of the Cs are unknown so starting with the C=0 case z'=z=**1**,**0:**

z=0=z_o=z' in the iteration of **eq.1** with δC=0 gives the Mandelbrot set C so a δz (sect.1)).

z=1 thereby implies z'=**1**+δz in **eq.1** with δC=0 gets 2D Dirac eq for e,*ν* (N>0 observer, eq11)

These **z=0**, **z=1** steps together imply the 4D **Newpde** with δz=r_H=(e^2/m)10^{40N} in $\kappa_{oo}=1-r_H/r=1/\kappa_{rr}$ (Ref3-5) 1/m boosted to small C', so got **postulate 1** (11a,implicit observable in 1st step). Repeat

Details of these z=0, z=1 steps

Solve equation 1 by itself (to at least see that z' can be complex)

But first plug z'=**1**+δz into eq.1 and get δz+δzδz=C (3)

For real C<-¼ $\delta z=\frac{-1\pm\sqrt{1+4C}}{2}=dr+idt$ (4)

is complex. Knowing z' is complex we then can then get the *complete* solution:

Solve eq.1 starting with postulated z= 1,0

1st step:

z=0=z_o=z' Also to find C itself substitute z' on left (eq.1) into right z'z' repeatedly & get iteration $z_{N+1}=z_Nz_N$-C. Constraint δC=0 requires us to reject the Cs for which -δC=δ(z_{N+1}-z_Nz_N)= δ(∞-∞)≠0 which gets the **Mandelbrot set** C_M (fig1) out to some ||Δ|| distance from C=0. That bare fig1Mandelbrot set structure is picked out of the zoom because it is built of lemniscate circles(sect.2.2,fig.7) and so implies eq.11 observables. Also Δ is found from δC≡$\left(\frac{\partial C}{\partial A}\right)_{dt}dr=0$ (sect.2.1). The smallest bilbous lobe of area 'A=drdt' as a function of d||z|| or dr is at at the Fiegenaum point -1.400115.. Note C_M ends up being real here so we really can use the above *real* C<-¼ approximation and so require complex z. That –¼ iteration also makes dr,dt real so dr^2+dt^2 C^2 .

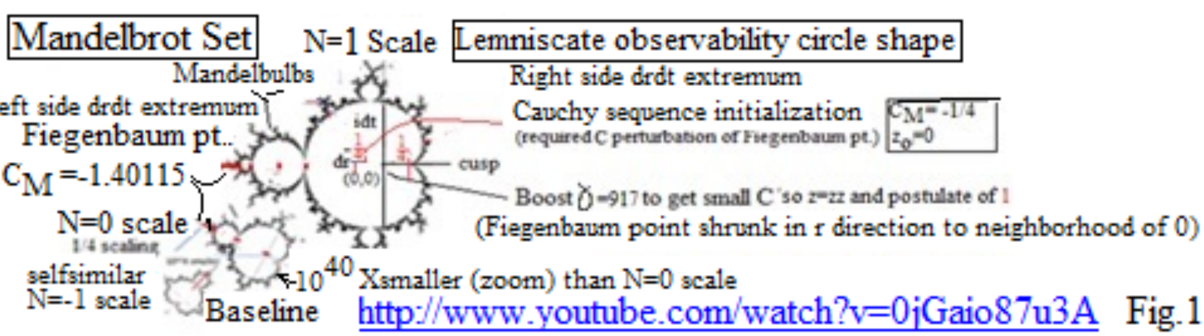


Fig.1

Note in distance units of 1 unit on the N=0 fractal scale, for observer N=1 scale lengths δz>>1

2nd step:

z=1 in z'=**1**+δz in eq.1 get eq.3 (For eq.11:$N_{observer}$>0, δz>>1 in N=0): δ(δz+δzδz)≈δδz(1) +2δδz(δz)≈2δ(δzδz)=0=(plug in eq.4)= 2δ[(dr+idt)(dr+idt)]. So

(Minkowski metric)+i(Clifford algebra) = δ[(dr^2-dt^2) +i(drdt+dtdr)]=0 (5)

Factor eq.5 real δ(dr^2-dt^2)=δ[(dr+dt)(dr-dt)] =0=[[δ(dr+dt)](dr-dt)]+[(dr+dt)[δ(dr-dt)]] =0 (6)

so (→±**e**) dr+dt=ds, dr-dt=ds ≡ds_1 , for $(-dr-dt)^2=ds^2$→ Ist and IVth quadrant (7)

Also note the positive scalar drdt of eq.7 implies the eq.5 *non* infinite extremum imaginary drdt+dtdr=0=$\gamma^i dr\gamma^j dt+\gamma^j dt\gamma^i dr=(\gamma^i\gamma^j+\gamma^j\gamma^i)$drdt so Clifford algebra $(\gamma^i\gamma^j+\gamma^j\gamma^i)=0$, $i\neq j$. (7a)

(→light cone ν) dr+dt=ds, dr=-dt, for $(-dr-dt)^2=ds^2\rightarrow$ III quadrant (8)

" " dr-dt=ds, dr=dt, for $(-dr-dt)^2=ds^2\rightarrow$ II quadrant (9)

(→vacuum,z=1) dr=dt, dr=-dt so dt=0=dr (So eigenvalues of dt, dr=0 in eq.11) (10)

We square eqs.7,8,9 $ds_1^2=(dr+dt)(dr+dt)=(-dr-dt)(-dr-dt)=[dr^2+dt^2]+(drdt+dtdr)$ $\equiv ds^2+ds_3=ds_1^2$. Since ds_3 (is max or min) and ds_1^2 (from eq.7,8,9) are invariant then so is **Circle** $ds^2=dr^2+dt^2=ds_1^2-ds_3$ also implying the rest of the Cifford algebra $\gamma^i\gamma^i=1$ in eq.7a, no sum on 'i' and also the lemniscate formulation(fig.7). Note this separate ds is a minimum at 45° (that Mandebrot set rotation) given the eq.7 constraints and so Circle≡$\delta z=dse^{i\theta}=dse^{i(\Delta\theta+\theta_o)}=dse^{i((\cos\theta dr+\sin\theta dt)/(ds)+\theta_o)}$, $\theta_o=45°$.We define $k\equiv dr/ds$, $\omega\equiv dt/ds$, $\sin\theta\equiv r$, $\cos\theta\equiv t$. $dse^{i45°}\equiv ds'$. Take ordinary derivative dr (since flat space) of 'Circle$\frac{\partial\left(dse^{i\left(\frac{rdr}{ds}+\frac{tdt}{ds}\right)}\right)}{\partial r}=i\frac{dr}{ds}\delta z'$. so

$\frac{\partial(dse^{i(rk+\omega t)})}{\partial r}=ik\delta z.$ so $k\delta z=-i\frac{\partial\delta z}{\partial r}$ (11)

(<F>*= ∫(Fψ)*ψdτ=∫ψ*Fψdτ =<F> Hermitian). The observables dr→k→p_r condition gotten from eq.11 **operator formalism** thereby converting eq.7-9 into Dirac eq. pdes (Circle solution also implies lemniscates, fig.7). Cancel that $e^{i45°}$coefficient (45°=π/4) then multiply both sides of eq.11 by ħ and define δz≡ψ, p≡ħk. Eq.11 then becomes the familiar: $p_r\psi=-i\hbar\frac{\partial\psi}{\partial r}$ (11)

z=1,z=0 steps together (on Circle with small C boost)

Postulate 1 also implies a small C in eq.1 which thereby implies a (Minkowski metric) Lorentz contraction 1/γ boosted frame of reference* in eq.3 $C=C_M/\gamma\equiv\delta z'=\Delta$ for next small smaller fractal scale $N_{ob}<0$. Also recall $\delta ds^2=0$ in eq.5. Thus we have a angle perturbation of dr,dt for $\theta_o=45°$ on that above **ds Circle** and so have a slightly modified eq.7:

$$(dr-\delta z')+(dt+\delta z')\equiv dr'+dt'=ds \qquad (12)$$

Since (eq.12) dr,dt is the (eq.11) observer $N_{observer}>0$ then δz' defines the N_{ob} object. Also the r,t axis' are the max extremum for ds^2, and the ds^2 at 45° is the min extremum ds^2 so Δθ=θmodulo45° pinned to an axis' so extreme Δθ≈±45°=δz'. So in eq.12 the 4 rotations 45°+45°=90° define Bosons (appendix A), and 45°-45°=0 eq.7-9 defines leptons. Again, for $N_{ob}<0$, you also have other (smaller) fractal scale extreme δz'(eg.,tiny Fiegenbaum pts) so metric coefficients $\kappa_{rr}\equiv(dr/dr')^2=(dr/(dr-(C_M/\xi_1)))^2=1/(1-r_H/r)^2=A_1/(1-r_H/r)+A_2/(1-r_H/r)^2$, r≡dr. The partial fractions A_I term can be split off from RN and so $\kappa_{rr}\approx1/[1-((C_M/\xi_1)r))]$ (13)

(C_M defined to be charge, $\gamma\equiv\xi_1$ mass). So: $ds^2=\kappa_{rr}dr'^2+\kappa_{oo}dt'^2$ (14)

From eq.7a $dr'dt'=\sqrt{\kappa_{rr}}dr'\sqrt{\kappa_{oo}}dt'=drdt$ so $\kappa_{rr}=1/\kappa_{oo}$ (15)

We do a rotational dyadic coordinate transformation of $\kappa_{\mu\nu}$ to get the Kerr metric which is all we need for our GR applications. So from eqs.4,5,14,15 we found the relation between x_i,x_j pairs: $\left(\sum_{i=1}^2\gamma^i\sqrt{\kappa_{ii}}dx_i\right)^2=\sum_{i=1}^2\kappa_{ii}d^2x_i$ (14a). So given this added 2D Δ perturbation we get curved space 2D⊗2D=4D *independent* $x_1,x_2\rightarrow x_1,x_2,x_3,x_4$. Also assuming orthogonality $dr^2\equiv dx_1^2+dx_2^2+dx_3^2$ (as r→∞ in eq.13,15) the right side of eq.14a therefore has the 2 in the sum replaced by a 4 implying the left side then has to be in eq.14a for the 2D form to be a special case (of any 2 x_ix_j): Imposing orthogonality thereby creates 6 pairs of eqs.4&5. So eq.14a becomes: $(\gamma^x\sqrt{\kappa_{xx}}dx+\gamma^y\sqrt{\kappa_{yy}}dy+\gamma^z\sqrt{\kappa_{zz}}dz+\gamma^t\sqrt{\kappa_{tt}}idt)^2=\kappa_{xx}dx^2+\kappa_{yy}dy^2+\kappa_{zz}dz^2-\kappa_{tt}dt^2=ds^2$.

Multiplying the bracketed term by 1/ds & **δz≡ψ** so eq 11 implies 4D **Newpde** (lemniscates 2.1)**:**

$\gamma^{\mu}(\sqrt{\kappa_{\mu\mu}})\partial\psi/\partial x_{\mu}=(\omega/c)\psi$ for e,ν, $\kappa_{oo}=1-r_H/r=1/\kappa_{rr}$ $r_H=e^2X10^{40N}/m$ **N**(=. -1,0,1., (16)
$=C_M/\gamma$ (from sect.2) C_M=Fiegenbaum point. So: **postulate1→Newpde.** syllogism
*That small C boost is thereby created by Newpde $r=r_H$ $2P_{3/2}$ stable state P (so $2S_{1/2}=\tau$,$1S_{1/2}=\mu$, appC). The 4 eq.12 Newpde e,ν rotations at $r=r_H$ are the 4 W^+,γ,W^-,Z_o SM Bosons (appendixA
So Penrose's intuition(1) was right on! There *is* physics in the Mandelbrot set, all of it.

Note the Fiegenbaum point 10^{40N}X N=..-1,0,1,..fractal scales in the Newpde $\kappa_{\mu\nu}$..
Note above we derived quantum mechanics of eq.11 and the Newpde We found the quantum mechanical implications of the Newpde in Chapter 3. For example $2P_{3/2}$ at $r=r_H$ composite 3e implied $2S_{1/2}$, τ, $1S_{1/2}$ μ

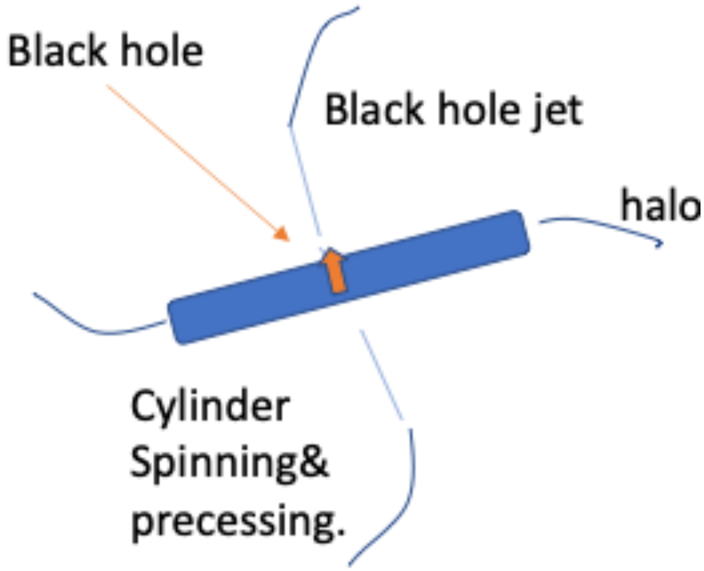
PartIII is a mere continuation of Chapter 3 on $g_{oo}=\kappa_{oo}$ metric quantization Quantum Mechanics.

Again, from Chapter 3, quantum mechanics is also fractal. In that regard recall that (from sect.1) in the small C frame of reference γ=2X917. Note also that:
$Gm_e^2/ke^2=6.67X10^{-11}(911X10^{-31})2/9X10^9X1.6X10^{-19}=2.4X10^{-43}$. $2.4X10^{-43}X2m_p/me=$ $2.4X10^{-43}X(2(1836))=2.2X10^{-40}$. We rounded this off to 10^{-40} . which was read off the Mandelbrot set zoom as the ratio of the two successive Mandelbrot set lengths. The $\sim10^{40}$ comes out of the Mandelbrot set with additional expansion contributions in Ch.7.

Metric Quantization

We start our discussion of metric quantization at fractal scale N=-1
Case B $r_H=CM/\xi=ke^2/m_ec^2$ *outside* r_H. CM is the Fiegenbaum point= $-1.40115(10^{40N})$, **N**=..,-1,0,1,.. =fractal scale m_e=electron mass. Solve for m_e.
$m_ec^2=ke^2/r_H$
$hf=2m_ec^2$. From the Dirac equation (Newpde) double Einstein relation we then solve for h (using m_e $f'=10^{-40}f$ and $m_e'=10^{-80}m_e$) *outside* r_H.
$h=(m_e/f)2c^2$ Solve for h, Planck's constant *outside* $h_{N=-1}=h_N10^{-80}/10^{-40}=h_N10^{-40}$
Note here then that h is directly proportional to CM and CM is fractal $\alpha10^{40N}$
so Planck's constant is fractal h_N. Note for N=-1 m is small so v is large (≈c). Next plug this result into the uncertainty principle $\Delta x\Delta(mc)\geq\hbar$. So
A) m_{N-1} *inside* r_{HN-1} uses h_{N-1} (eg.,$[\Delta x\Delta(m_{N-1})]c=h_{N-1}$). $h_{N-1}f=m_{N-1}c^2$). (Usual fractal result. Fractal universe implies $h_{N=-1}=10^{-120}h$ inside so $(10^{-40}\Delta x)(10^{-80}m_ec)=h10^{-120}$. accounting for that 10^{120}X discrepancy in the qed cosmological constant Λ with GR's (Λ is also proportional to energy) .See also sect.7.6.).
B) m_{N-1} *outside* r_{HN-1} uses $h_{N=1}=10^{-40}h$ (eg., $[\Delta x\Delta(m_{N-1})c=h_{N=1}$ (largeΔx) $\Delta x10^{-80}m_ec=10^{-40}h$ then Δx is the size of the universe ($\sim10^{12}$LY) and tiny f the frequency of oscillation of the universe. This is also our old Newpde N=1 case. But for the
muon $1S_{1/2}$ component $m\mu_{N-1}$, frame of reference f is about 10^5 year period oscillation and truncated $\Delta x=\Delta r=10^5$LY is the size of a galaxy. Note this N=-1 case is gravitational. This uncertainty region forms a metric quantized gravitational field ("bubble").
Note also that $mv^2/r=kGMn/r$ comes from a field with local cylindrical symmetry so that r cancels out allowing us to set $\mathbf{g_{oo}=\kappa_{oo}}$ (11.1)
which results in orbital stability. So a **pancake shaped $1S_{1/2}$ state uncertainty cloud (N=-1** self gravitating **bubble)** in the plane of the galaxy provides gravitational stability for planar

structures of this size since it implies the cylindrical symmetry $g_{oo}=\kappa_{oo}$ case in the halo and so metric quantization stability for this shape.(see partIII). Other shapes can exist but they are not as stable and so eventually the flat $1S_{1/2}$ state prevails. So a pancake shaped $1S_{½}$ state uncertainty cloud in the plane of the galaxy provides gravitational stability for planar structures of this size since it implies the cylindrical symmetry $g_{oo}=\kappa_{oo}$ case in the halo and so metric quantization stability for this shape. The **disk only goes out to about 10^5 LY** and stops as we said which is a phenomena visible in Centaurus A and the Andromeda galaxy with its own 300km/sec and 200km/sec abrupt drop offs in the Vera Rubin red shift studies. Note these flat structures are simply those N=-1 (outside) gravitational field sources (recall they formed the gravity field of the Schwarzschild metric) in sect.1), not exotic particles.



Note solid cylinder moving as unit

X ray through radio wave Image of galaxy Centaurus A

Fig.1 The Milky Way 13by ago also formed the "thick" disk at 6oooLY thick because 100km/sec, then a galaxy collision occurred making the galaxy heavier forming the "thin" disk 2kly thick since then halo speeds were at 200km/sec. (March 2022 "Nature", Maosheng Xiang)

11.2 Notional Idea Of Metric Quantization

Quantization on the fractal subatomic scale should be repeated on the next higher 10^{40}X fractal scale(cosmological), hence the metric quantization

11.3 From eq.11.1 In halo $\kappa_{oo}=g_{oo}$ For outside r_H.

For a grand canonical ensemble with nonzero chemical potential, as occurs in the halo of the galaxy, section 11.1 metric quantization implies that $g_{oo}=\kappa_{oo}$ holds. From equation D9 also because of object B $\kappa_{oo}=e^{i(me+mu)}=e^{i(\Delta\varepsilon+\varepsilon)}$, $\Delta\varepsilon=m_e=.000058$ is the electron mass (as a fraction of the Tauon mass.) which is the component in the resulting me, mu operator sequence.

Appendix D review

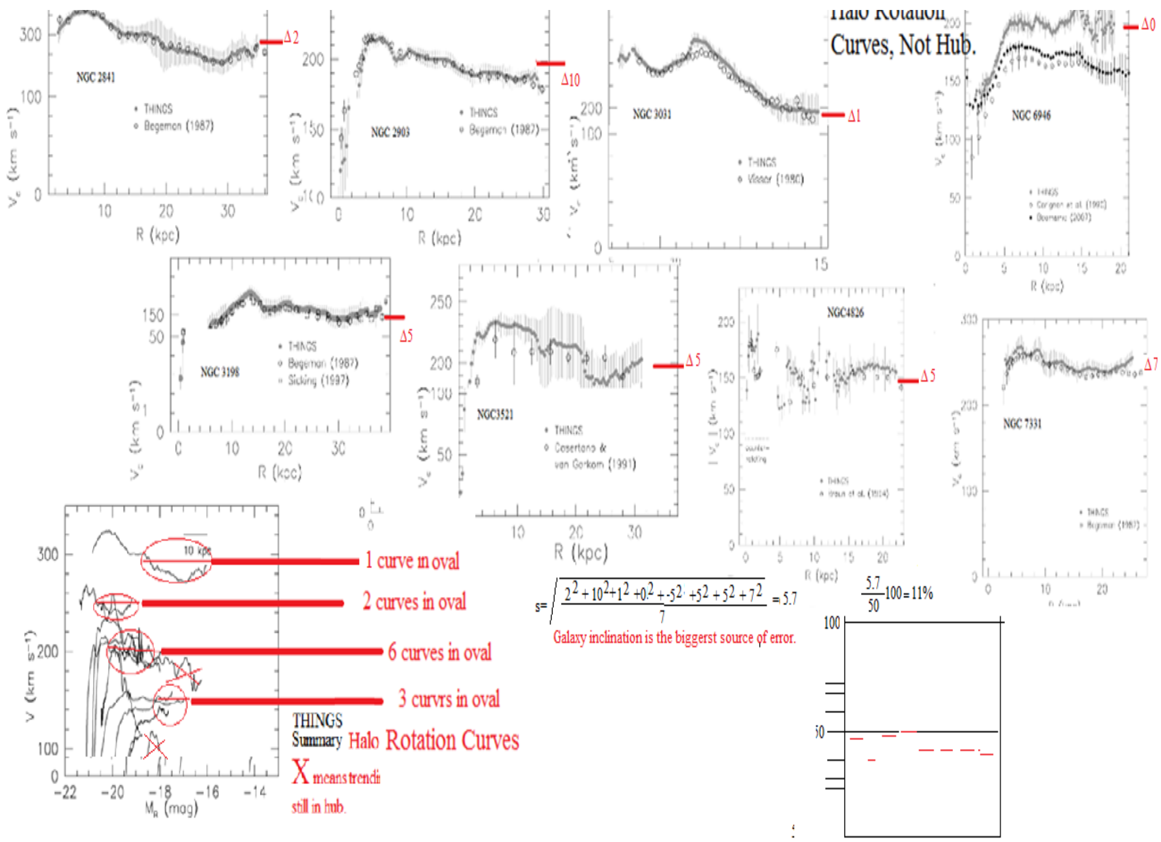
From equation D9 $\kappa_{oo}=e^{i(\Delta\varepsilon+\varepsilon)}$ in the halo of the galaxy. Also for r big the charged ε gets normalized out since there are infrequent (big) ε jumps in those regions so $\kappa_{oo}=e^{i(\Delta\varepsilon+\varepsilon)/(1-2\varepsilon)}$ (but (but more rapid jumps in high gradient regions). Recall also from equation 11.1 that in the halo of the galaxy also: $g_{oo}=\kappa_{oo}$.

So in the halo of the galaxy $e^{i(\Delta\varepsilon+\varepsilon)/(1-2\varepsilon)}=\kappa_{00}=g_{00}=1-2GM/(c^2r)=\mathrm{Rel}\kappa_{00}=\cos[\Delta\varepsilon+\varepsilon]=1-[\Delta\varepsilon+\varepsilon]^2/2=1-[(\Delta\varepsilon+\varepsilon)^2/(\Delta\varepsilon+\Delta\varepsilon)]^2/2=1-[(\Delta\varepsilon^2+\varepsilon^2+2\varepsilon\Delta\varepsilon)/(\Delta\varepsilon+\varepsilon)]^2/2$. The $\Delta\varepsilon^2$ is small so just take the mixed state cross term $v=c[\varepsilon\Delta\varepsilon/(\varepsilon+\Delta\varepsilon)]/2=c[\Delta\varepsilon/(1+\Delta\varepsilon/\varepsilon))]/2=c[\Delta\varepsilon+\Delta\varepsilon^2/\varepsilon+\ldots\Delta\varepsilon^{N+1}/\varepsilon^N+..]/2=\Sigma v_N$. Note

each term in this expansion is itself a (mixed state) operator and we assume that division of each of these terms by 1-2ε as above. So there isn't just one v in the large gradient 2nd case so in equation 1 just above we can take $v_N=[\Delta\varepsilon^{N+1}/(2\varepsilon^N)]c=(.00058^{N+1})/(2(.06)^N)c$ (11.2)
v_N=…1mm/sec(N=4), 10cm/sec(N=3), 10m/sec(N=2),1km/sec(N=1), 100km/sec(N=0)..
So these speeds arise from mixed metric quantization states εΔε operating on the Newpde ψ. In classical thermodynamics they are Grand Canonical ensembles with nonzero chemical potential (1). If there is zero mixing, so zero chemical potential, these mixed states εΔε do not exist and so these v s do not apply (so classical ballistic trajectories then apply). Recall also that metric quantization equation $g_{oo}=\kappa_{oo}$ implies that in equation 11.2 Δε (=.000058=e) gives a speed of n100km/sec (for N=0 in eq.11.2) and ε=.06=μ is a speed of 20,000km/sec which is our rotation speed around the center of the universe. 1=τ gives a rotation speed of c at the time of the mercuron (with very low radial velocity)
Note the N=0 case in eq.11.2: $v=n\Delta\varepsilon c/(2(1-2\varepsilon))=n(.00058)3X10^8/[2(1-2(.06))]$ =n98,860m/sec =nX(98.86)km/sec≈n100km/sec. So in the galaxy halos we have v=100km/sec, 200km/sec., thereby replacing the need for dark matter (to explain these high speeds).
If the rings are heavier than the hub then the metric quantization is between the sides of the rings, twice the COM speed and so still an integer multiple of 50km/sec.
(1)Konstantin Batygin. Monthly Notices of the Royal Astronomical Society, Volume 475, Issue 4, 21 April 2018. He found that cosmological Schrodinger equation metric quantization actually exists in the (observational) data, a notion that is close to this fractal Newpde idea.

11.5

Examples Of Case I $g_{oo}=\kappa_{oo}$ **Here we look at distance vs velocity in galaxy halos to note possible constant velocity**
Here use the THINGS survey data instead of SINGI. We include in this section only flat trending v vs r galaxy halos. NGC 3031 rotation curve is consistent with flat trending galaxy halos, at 200km/sec, NGC 3198 rotation curve is consistent 100+100/2, NGC 2903 at 200, NGC2841 at 300 km/sec consistent, NGC 3521 is consistent at 200km/sec, NGC 4826 is consistent with100+100/2, NGC 5055 consistent at drop off 200?, NGC 6946 consistent for THINGs survey., NGC 7331 is consistent at 200+100/2, NGC 7793 consistent with 100 (but should not count since still in hub). If the rings are heavier than the hub then the metric quantization will be between the rings which will be twice the COM speed. (see 2X50 below cases).

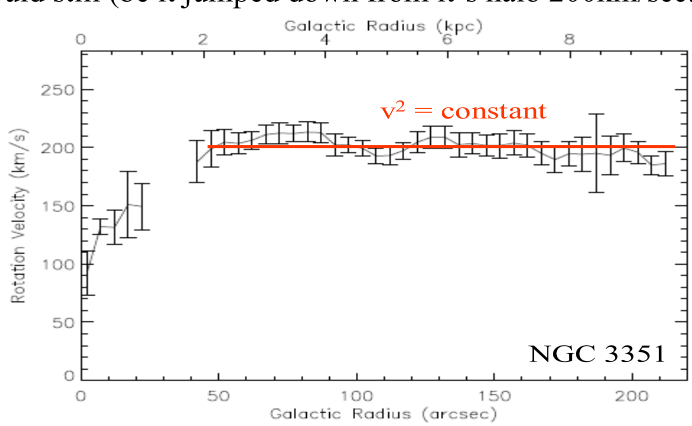


11.6 Still In Hub

Still in the hub means the curve is still trending up or down. So do not count NGC 925 and NGC 2976 (still in hub). IC2574 not counted since Things didn't show its rotation curve. NGC 4736 don't count still in the hub, DD154 still in hub. NGC2366 not include since no rotation curve given. Since some error bars include 100+100/2 NGC 2403 might not not be an outlier.

`1.`

So out of 10 galaxies that must be counted only one is uncertain NGC 5055 but even that one could still (be it jumped down from it's halo 200km/sec. near the end. Andromeda does that too.)



Stellar halo speed at ~200km/sec Fig.2

Metric quantization is exact.

11.7 Transition Matrix Elements of These Weak Mixed States

4.3.1 Transition Matrix Elements Of Metric Quantization Mixed States

V_s=C Here

These ε^N are M+1 fractal scale quantum eigenstates every bit as much as the principle quantum number N and the Rydberg $E=R/N^2$ is for

the hydrogen atom for the Mth fractal scale. So each of the terms in the series represents individual (metric quantization entangled substates state jump c given entanglement perturbation V_e in $V_e/(Ee_1-Ee_2)$ and also entanglement <en2|H|en1> probability of transition matrix from entangled state to entangled state. The $V=kC^2$ in eq.2 assumes the role of the noise (energy) V and is limited by eq.4A relativity considerations. Thus relativity puts an upper limit on noise C. Also in the entangled state cases these terms imply constant v s for a range of radii (eq.23.9) in a grand canonical ensemble with nonzero chemical potential. Note in chapter 23 that entangled ground state $\Delta\varepsilon/(1-\varepsilon)^2$ gives 100km/sec, entangled $\Delta\varepsilon^2/\varepsilon$ gives 1km/sec, $\Delta\varepsilon^3/\varepsilon^2$ gives 10m/sec metric quantization $\Delta\varepsilon^4/\varepsilon^3$ gives 0.1m/sec . $\Delta\varepsilon^5/\varepsilon^4$ 1mm/sec. Eq.4.4.12 then gives the mixed state background metric. This state mixing is analogous to the trig identity result for real valued quantum operator $<|O|>^2= |\psi|^2 =(\cos\omega_1 t+\cos\omega_2 t)^2 = \cos^2\omega_1 t + \cos^2\omega_2 t + 2\cos\omega_1 t \cos\omega_2 t= \cos^2\omega_1 t + \cos^2\omega_2 t + 2\cos\omega_1 t \cos\omega_2 t= \cos^2\omega_1 t + \cos^2\omega_2 t + (\cos((\omega_1-\omega_2)t + \cos((\omega_1-\omega_2)t)$. This generation of smaller $(\omega_1-\omega_2)$ “beat” frequencies by entanglement represents the smaller and smaller terms in the equation 4.4.12 Taylor expansion since this calculation can be repeated again and again with these even smaller frequencies. The classical analog of this type of quantum entanglement is that metric quantization grand canonical ensemble with nonzero chemical potential (i.e., interconnected systems hence the mixed states) and thus implies the many metric quantization applications of part 6 of this book. Note in metric quantization that also $C\rightarrow 0$ and so these separate objects can exhibit bosonization given that $v\rightarrow 0$ in the eq.17.2 pairing interaction. So singlet states and multiples of singlet states have minimum energy. So Vs/(Es2-Es1) is the largest for the singlet state so transitions to these states have higher probability (so $\Delta\varepsilon$ gives 2(100)km/sec let’s say is seen more than 3X100) and even larger for two singlet states 4(100km/sec) . Recall from that Tokomak edge effect analysis those dense plasmas are metric quantized in multiples of 400km/sec, 800km/sec,1200km/sec.

There appeared to be jumps to those plateau speeds as you go from the outer to inner part of the plasma in the toroid.

The solar wind appears to be metric quantized too, also in units of about 400km/sec with highest solar wind speeds quoted as 800km/sec. Equation 13 indicates there are many rotational states of equal separation, there is the first rotational state at ~100km/sec, and those many smaller 10km/sec entangled states.

For the rotational states the transitions are for J and so for S and L and can be handled with the Clebsch Gordon coefficients which give you the singlet and triplet states for example..

The corona arises because of a <r_o|H|en>=large nonzero metric transition between rotation states <ro| and entangled state <en|. H is the Hamiltonian which includes these vibrational and rotational states and nixed states. The <r_2|H|en> mixed state probability is much larger than for <en_{99}|H|en1> mixed state. For global magnetic field high energy density recombination we get flares. Locally we get 511kV rotator oscillator microflares since have high local energy density. .

This comes out of time dependent perturbation theory in which the first order perturbation state probability coefficients c go as
$Ve/(Een_1-Een_2)$). So when the energy is high enough the entangled state jump c is much smaller than the rotational since Vr in $Vr/(Er_1-Er_2)$ and so c is much larger. (local 511kVoscillator ROTATOR microflares provide the Vr=energy=<H> to the dep rotator states here making <ro|H|en> large. Each local microflare becomes an individual filament of the corona.
The rotation is caused by $mv^2/r=q(vXB)$ helical rotation around the B flux tube).
(en is the mixed state, r1 the first rotator state).
So the transition is into the rotational states <r^2|, not the <en99| mixed state for example. cannot occur and the solar corona actually disappears (solar min and also coronal holes).
Also from Stoke's theorem the integral over the surface S of curlv*dS/C=integral of vds/C around the boundary $C\frac{\oiint_C ((\nabla X v)*dS)}{C} = \oint_C v * ds.$ =constant comes out of $g_{oo}=k_{oo}$.

11.8 High Frequency Metric Quantization Jumps Here Imply Low Amplitude Jumps.

Low object B frequencies means for the Dirac zitterbewegung $r= r_o e^{kt}$ the jumps are much higher if separated by a larger time so their amplitudes are larger. Recall the definition $2mc^2=\hbar\omega$ so $km=\omega$.so higher frequencies in ε in $\kappa_{oo}=1-r_H/r+\varepsilon$ in $E=1/\sqrt{\kappa_{oo}}$ mean lower amplitude metric quantization E. So the mass energies are given by ω=1, ε or Δε for the mass and so the Δε is the lowest fundamental $\Delta\varepsilon=\omega_o$,. $\varepsilon/\Delta\varepsilon=n\omega o=100\omega_o$ harmonic antinodes across the rotator between antinodes ε/Δε. The Δε is about 100=ε/Δε antinodes across and at the moment of the big bang were spherical Bessel function standing wave antinodes inside a sphere. They provide the nucleus for the perturbations of a Rayleigh Taylor instability $\omega^2 =(\rho_1-\rho_2)kg/(\rho_1+\rho_2)$ Richtmeyer Meshow. Thus the Laplacian gives us $\omega_2=100X\omega_1$ producing 100 nodes in that big bang object diameter from that solution of that Ricci (Beltrami) Laplace wave equation for this third order feedback mechanism. Note we can in addition model the big bang as a core collapse supernova resulting in that Rayleigh Taylor instability (seen in the M1 supernova). These nodes give the Rayleigh Taylor instability inhomogeneity's in the explosion responsible for those filaments of galaxy clusters. Thus the Laplacian gives us $\omega_2=100X\omega_1$.producing 100 nodes in that big bang object diameter from that solution of that Ricci (Beltrami) Laplace wave equation for this third order feedback mechanism of present day average radius of 280Mly assuming a present 13.7by radius universe radius. Thus there are $(4\pi/3)50^3$= 524,000 nodes in all resulting in about 500,000 voids in the later universe (370by later).
Also the Gamow factor is $T=\exp(-2\pi\alpha(ke^{-kr}))/\beta)$ with β=v/c, α=fine structure constant, and r≈0, (i.e., nuclear force analogous to thin 'glue' layer) with k depending on T. v gets bigger at small t so small volume (Think of it as a Charles's law effect if you want to.) so the Gamow factor increases. Thus the rate of tunneling increases implying the nuclear force k is decreasing since more particles are leaving the potential well. With k getting smaller too this results in a mere ~1/10 volume decrease and associated smaller atomic weight supernova output (eg., C,Si,O, not Fe, Ni at that time) makes for adusty universe and little iron and nickel at that time. O++ (green) could then dominate in the spectrum then.

11.9 Metric Quantization States Are Fermionic

In the equation 11.3 metric quantization states there is a mixture of ε and Δε states, both Fermionic since they are both eigenstates of the new pde. As an analogy recall in atomic physics you fill the S states and fill the P states to get stable states.(eg. Nobel gases). So that means the filled singlet states are two Fermions, usually the highest energy state.. So instead of the ground

state 100km/sec we have the filled state as 200km/sec for galaxy halo speeds and for O,B,A spectral class stellar speeds. . For the sun's equatorial velocity we have the filled state 2km/sec instead of the ground state 1km/sec. For a Mesocyclone and other air motion we have the filled state of 20m/sec instead of the 10m/sec ground state.
Note about 80% of the galaxies in the SINGII galaxy survey were 200km/sec, not 100km/sec. Note the sun's surface is at 2km/sec, not 1km/sec. Note the mesocyclone is at 20m/sec, not 10m/sec.
So both the theoretical eq.13) and the observational evidence points to the fact that these metric quantization states are Fermionic!

The implication here is the there is a spin component on the ambient metric, which is singlet in most cases, nullifying the spin, allowing us to disregard this effect, in almost all cases in Einstein's equations.
Einstein's equations themselves apply to spin 2 and so four of these states implying another stable metric quantization state at 4 (eg. 400km/sec which has been seen in Tokomaks)

Also note our own Milky Way halo **2 level** of figure 23.6 (i.e., 2X100km/sec) background metric quantization for the Δε electron lends itself to the N.N.Bogdiubov quasiparticle transformation (two electron) pairing interaction discussed at the end of section 17.2. So the superconducting state might look very different in 3 level (i.e., 3X100km/sec) NGC 2841 halo for example.
Note also that small galaxies would appear anomalously heavier (giving that ~100km/sec) as has recently been observed by the Stacy McGaugh group (seeing a 100 to 1 ratio of quantized metric to baryonic mass gravity effects). A violent disruption of a small galaxy (with its halo v~100km/sec) on collision with a larger galaxy (e..g., v=200 or 300km/sec) would occur when it transitioned to the higher quantized v causing far more rapid mergers than those purely Newtonian computer multibody simulations would imply Also, given the radial distribution of (metric quantization) would be provided by a galaxy cluster collision analogous to an electron radiating coherent oscillatory radiation as it drops down in energy (ie.,collides with) in a hydrogen atom.
The metric quantization region also exhibits self gravity (like the cosmological long 511 tubes do) and so can be in metric quantization spherical states just as an electron in a hydrogen atom can be in spherical quantum states (eg. S states).

Chapter 12 Cosmological Observations Of Metric Quantization
Recall the Metric quantization 1km/sec,10m/sec,...,1mm/sec.
Recall metric quantization applies to grand canonical ensembles with non zero chemical potential.
(On the quantum level that would be an mixed state (eq.13)). .It does not apply to a single ballistic trajectory.
But what about the in-between case of the ballistic trajectory particles just beginning to interact with the other object (ie,. exchange energy) but not quite the full scale grand canonical ensemble with nonzero chemical potential as in Saturn's rings or that spark gap? A space craft flyby sling shot trajectory is such an in-between case. . Well then, in that case we might start seeing a barely detectable (possibly not) bit of metric quantization, perhaps at 1mm/sec, 2mm/sec,. 4mm/sec ,.., 13mm/sec, anomalous speed difference from the predicted one?

Hey, the Galileo space craft slingshot earth flyby got a anomalous 3.92mm/sec boost and the NEAR spacecraft flyby got a 13mm/sec boost.

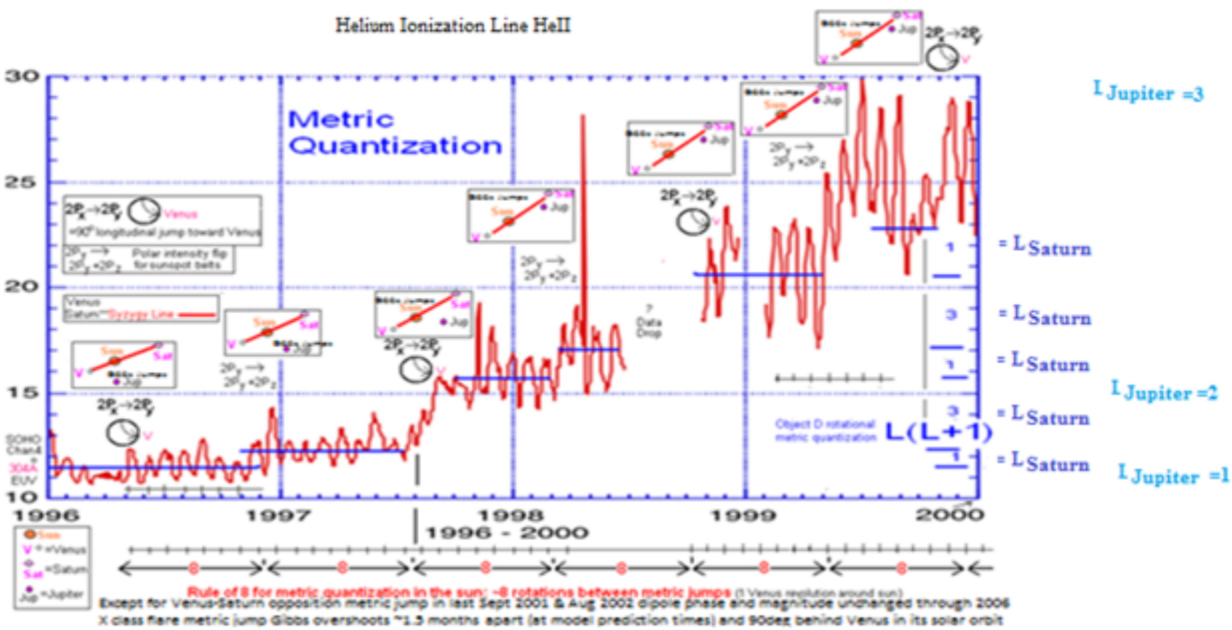
>, "anomaly appears to be dependent on the ratio between the spacecraft's radial velocity and the speed of light, "
There is maximal chemical potential (exchange of energy) for the radial motion.
Also the difference between the aphelion and perihelion speeds of the earth is 2km/sec making the earth's orbit stable because of metric quantization. If it was not for this orbital stability of the earth there could not have been enough time to have evolved in the goldilocks zone to be human beings. Metric quantization is responsible for the human race!!! That is because the planets perturb each other's orbits continuously and the time it takes for this to lead to chaotic orbits is the (relatively short) Lyapunov limit (if not for metric quantization).
From the mainstream:

"In 1989, Jacques Laskar demonstrated that the Lyapunov timescale for the terrestrial planets was only a few million years (Myr)."

But the solar system is billions of years old!! Anyway, the existence of the human race depends on metric quantization.

12.2 Direct Measurements For Local Metric Quantization Are Possible
Recall fig 1-1, ch.1 gives two other extrema for ds^2 (but not for dr+dt) at $\theta=0$ ($dr/dt\to\infty$) 90° ($dt/dr\to\infty$). The 90° extrema simply implies particle stability and the 0° extrema, since it must apply to some $dr>r_H$, implies that effects that move through horizons r_H are seen as instantaneous inside (i.e.our periodic metric jumps of the next chapter).
Recall we required the cosmological radius $r_c=1.325X10^{26}$m for average speed c/2 and $(c/2)^2/r_c$ $=1.7X10^{-10}$m/s2 when doing the '1' metric quantization instead of the $\Delta\varepsilon$ choice in equation 23.2. Recall from equation 23.4a that 'a' is quantized in units of $a_M=10^{-10}m/s^2$ so that $a=Na_M$ where N=1,2,3,..Those (huge) electron metric small sized jumps have a 5 minute period (recall $\Delta\varepsilon$ jumps were 2.7my period).
We can calculate how many jumps that represents over a gravity change for Jupiter moving from its perihelion position with Saturn syzygy to a neap tide minimal solar tide position. Each acceleration of gravity jump is taken to be that of $\Delta g=a_{Mond}=a_M=1.7$Angstrom/sec^2.
Note we use $GM_sm/r^2/2=M_sa$ between Saturn syzygy with Jupiter (section 24.8) and no Saturn syzygy the difference in the suns acceleration is simply in what is provided by Saturn:
$GM_sm_s/(1/r_s)^2)/2=6.67X10^{-11}(2X10^{30}).5(95.1X6X10^{24})(1/(9.048(93X10^6X1600)^2$
$=(1.7X10^{46})(.5)(5.52X10^{-25})=.5X10^{21}=2X10^{30}a$ so $'a'=.5X10^{21}/2X10^{30}=$
$23X10^{-10}m/s^2=23a_M$. 23/1.7=13.5.
Gravity gives the rate of solar activity and diffusion and so sudden metric changes give sudden (and very small) radiance changes. The calculation implies about 13 such jumps.
There were about 15 in the example. The jumps go in the sequence 1,3;1,3;1,3,6
By the way the equivalence principle will not allow observers in inertial (free fall) frames to notice these jumps so the celestial mechanics orbits are for the most part unaffected.
But for two 1kg masses 20cm apart the acceleration of gravity would be $10a_M$ s.
The jumps would be easily observed as one mass was brought in toward that other (i.e.,$1a_M$,$3a_M$,$6a_M$,..)

In contrast if measurements of G were made at different laboratories at different separations the error bars in the measurements might not overlap because of this G quantization.
Solar cycle is proportional to rate of fusion. The rate of fusion is proportional to T^{17}.for CNO stars. For the PP fusion in the sun it is proportional to T^4. T in the sun is a function of the isostatic equilibium of gravity pull and thermal energy pressure. Thus a small change in gravity(here metric) gives a small change in solar activity. Planetary tidal effects given by $\Sigma F_i|\cos\theta_i|$=re give short term solar activity cycle because a diffusion charge layer exists on the sun (due differential diffusion of protons and electrons) . Amperes law currents and B fields are then modified and through Fick's law the rate of energy diffusion out of the sun is then modified.



1000	P	303.7804 He II	MK00b
500	P	303.7858 He II	MK00b
10		320.293 He I	TW71
2		505.50035He I	M02

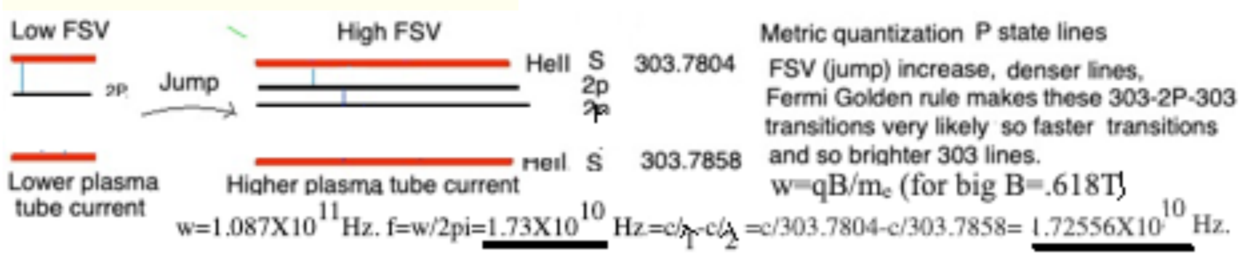


Fig.3

The cyclotron frequency $w=qB/m_e$ (for big B=.618T from observed Zeeman effect , so $w=1.087X10^{11}$Hz. $f=w/2\pi=1.73X10^{10}H=c/\lambda_1-c/\lambda_2$ =c/303.7804-c/303.7858= $1.72556X10^{10}$ Hz. The λ_1 line can then directly lose a photon to the λ_2 line through the cyclotron frequency Bremsstrahlung photon closer is the cyclotron frequency to the ideal of $1.72556X10^{10}$Hz, cyclotron frequency. The 10m/sec metric quantization jumps in the plasma tube raise the energy in steps and get the cyclotron frequency closer to the $c/\lambda_1-c/\lambda_2$, frequency analogous to the jumps to the next energy level in a helium laser with electrical current rise. A jump in modes mean, from Fermi's Golden rule, a lower FSV and so higher rate of energy level jumps between 303 lines and these intermediate lines and so brighter the HeII lines. Thus the HeII lines jump in intensity like a Heaviside function at metric quantization jumps. Other spectral lines don't do this.

The Quantum Mechanics of the Transitions Between Metric Quantization Lines and Ordinary E&M Quantization. Lines

So where does this other hidden metric jump quantization energy go since optically we cannot detect it?

I did a computation of that quantity and surprisingly curlv terms at. distance come out. They are very high frequency and so may elude your run of the mill small gravitometer but not a large body or gaseous matter, (eg.,hurricanes on earth). or the large LIGO before they put in the crackle filters.

Recall the HeII (helium 2) line. If the speeds jump in metric quantized units in the plasma tube the intensity of the upper line separated by the cyclotron frequency 17.25 Gighz will jump also since the temperature and so free energy around the plasma tube thereby jumps. We use mw^2r=evB so evB/(mw^2)=r here (also need $.5mv^2=3/2kT$ to solve for v in terms of T). It lifts electrons, just as happens in a laser, from a stable state to a metastable state where transitions to ground occur rapidly due to spontaneous emission here and so you get a brighter 303 line at metric quantization jumps because the v and so the temperature jumped. So higher temperature and so more photons are involved. The effect of the Hell line jumping in intensity with metric quantization jumps is then similar to the functioning of a laser! Note the temperature in the plasma tube has to jump also with the v.

The metric quantization of the sun's gravity (seen in those EUV metric jumps) is due to a huge electron at 10^{16} LY "Bohr radius" orbiting that proton containing objects A (i.e,. our own "universe"), object B (responsible for the galaxy halo metric quantization and farther away object C.

An electron at this (huge) Bohr orbit does numerically give thecorrect metric quantization seen in the (above) solar EUV data and is consistent with the 5 minute solar oscillation resonance as well. Thus the ratio of the frequencies: 2.7My/1monthmin$\approx 10^{10}$, ratio of the Fdx energies: $1/10^{-15})^2$ dx/1/(10 $^{-10}$) ^{2}dx/$\approx$10 ^{10}

The period of oscillation of those supermassive and massive black holes in the same way (section 23.7) is in resonance with the ε(250my) and $\Delta\varepsilon$ (2.7my) metric jump times respectively. Recall the $\Delta\varepsilon$ metric contribution gives the galaxy halo quantization, the numbers work out extremely well also (section 23.4, that 87km/sec beautiful halo velocity result). Note here for superluminal motion the relationship between energy and velocity and frequency is reciprocal of the usual relationship. So for v>>c in the dr/o extrema superluminal regime (of section 1.1) :

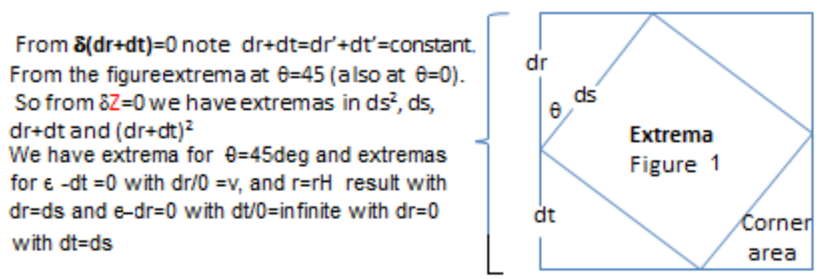
$E = mc^2 = \frac{im_0c^2}{\sqrt{1-\frac{v^2}{c^2}}} \approx \frac{im_0c^2}{i\frac{v}{c}} = \frac{m_0c^3}{v} = \frac{m_0c^3}{\omega r_H}$ So that energy changes are proportional to 1/ω. Thus for superluminal motion the higher the velocity and higher the frequency the smaller the energy, in contrast to standard quantum mechanics that has the usual relationship between energy and frequency. Thus the ε and Δε metric jumps are much larger and with a larger period than the metric jumps giving the solar gravity metric changes due to that "electron" motion at the (10^{16} LY) Bohr radius of our object A,B and C proton we are inside of (recall we are inside the object A electron).

This is exciting stuff, probing another (fractal) atomic physics on a 10^{16} light year scale. by simply observing the EUV stair steps over the duration of a solar cycle (see above figure).

The compressed big bang object behaves like a water drop the same as the nucleus does.as we mentioned in chapter 2. The speed of the superluminal changes (or the speed of sound for that matter) is greater then the expansion rate when the object is completely compressed. The small Δε oscillation is a L=100,000 spherical harmonic on top of the fundamental oscillation giving the cbr power spectrum and is the large void regions observed in the present universe. The object D electron has an even higher frequency and so smaller superluminal effect and is responsible for a $L=10^{10}$ harmonic and so is the origin of the galaxy.substructure of the universe.

In quantum mechanics the *particle* states such as energy and angular momentum are quantized in bounded systems. In this fractal physics we 'inside' those particles so this translates into a *quantization of what the particle is made of, the metric itself.*

12.2 ε,Δε Metric Dispersion Relation In the Gravity Wave Equation For $r<r_H$



From the figure ε-dt≡0. So dr/dt=dr/0 makes metric quantization propagation effectively instantaneous. See figure 23-11 for an example. The other extrema implies ε-dr =0. So for $r<r_H$ this is an extrema at the center r=0. Recall the plus sign in $r=r_o(1--e^{\pm kt})$ for motion back to the central extrema. Note the axis of evil gives a hint of this second extrema at r=0.

Recall that regard recall we found that the minimal 45° extrema of δds=0 in figure 1-1 (with dr+dt=ds√2) also gave us our ordinary relativity and our new pde. But there are observable consequences of the other two extrema conditions of figure 1-1 as well. For example in moving from a position of that minima 45° extrema of δds=0 to the maxima extrema dr/dt=∞ you *must* pass through a horizon r_H as mentioned in the mathematical induction part of section 1.4. Thus those quantized motion effects (e.g.,rotational quantum number changes for objects B and C) reach the inside of r_H nearly *instantaneously.* For example in the gravity wave equation there is that usual $1/c^2$ denominator factor in front of the second time derivative so we have speed c. But to include the ambient metric $r=r_o\sinh\omega t$ repulsive component however we must include the ambient metric factor $(1+2GM/c^2r)c^2 \equiv (c^2+(\omega r_H)^2)$ for the metric cosmological expansion (repulsion). This equation essentially is a dispersion relation in the gravity wave wave equation since in the usual gravity wave derivation this new component ends up in the wave equation denominator as a coefficient of the time component dt^2. Note for the universe $GM \approx 10^{55}$(mks), $r \approx 10^{25}$m so $(1+2GM/c^2r)c^2 \approx c^2+v^2=10^{16}+10^{30}$ giving a dispersion relation speed v of several billion c. Note ordinary GR gravity does not contain this repulsive component. Thus metric changes move across the universe instantly while weak gravity (as well as ordinary E&M) waves move at the speed of light. Thus a metric change event is first observed locally and then is later observed at some large distance, even though the event occurred simultaneously at all these points.

As an example the observable consequences (e.g., increased star formation in the great wall) appear to propagate away from any given location at the speed of light in a steadily expanding shell. Thus the observed metric quantization jump boundaries must move away from us. So there must be a periodic rapid decrease in the ambient metric coefficients because of those object B and C quantum jumps. In that regard recall just the quantization of the $\Delta\varepsilon$ red shift in units of observed 75km/sec. That $\Delta\varepsilon$ and ε lead to a 75km/sec and $(\varepsilon/\Delta\varepsilon)$75km/sec $=v_q$ =7345km/s quantization of the red shift(calculation above). c/v_q=13billion/x leads to x=3.1million (for the $\Delta\varepsilon$ substitution) and for the $\varepsilon/2$ substitution we get 310million year interval in time between major metric changes(actual 290mY)

along with the above object C 1/3 split. Recall from equation 22.1 that

$E \propto \int \sum_{n=0} \sin((2n+1)\omega t)/(2n+1)dt$ for both ε and $\Delta\varepsilon$ separately.

Thus there is an associated Gibbs overshoot phenomena. Now when the metric changes like this the very properties of mass have to change. See figure 23-11.for ε changes (red lines). Note you should see greater star formation in such a metric shift region at the upper overshoot, stars about 600mY light years away from us. In fact this is seen. It is called the great wall of galaxies.

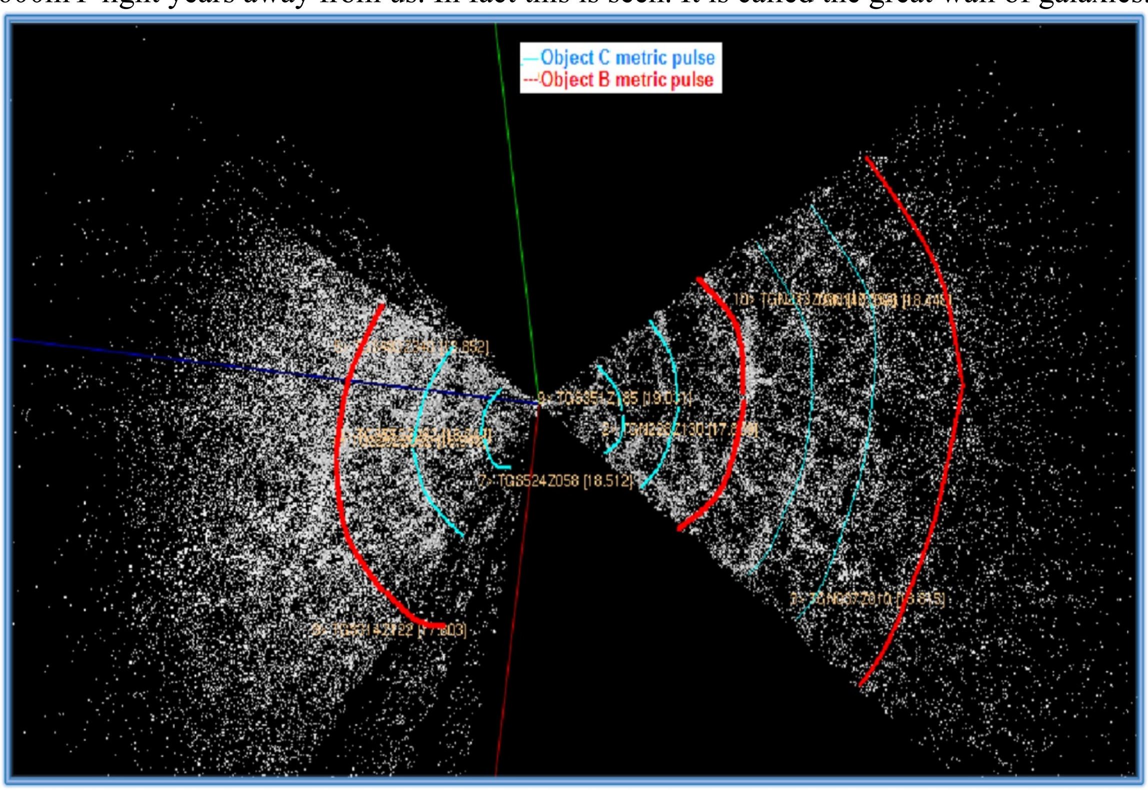
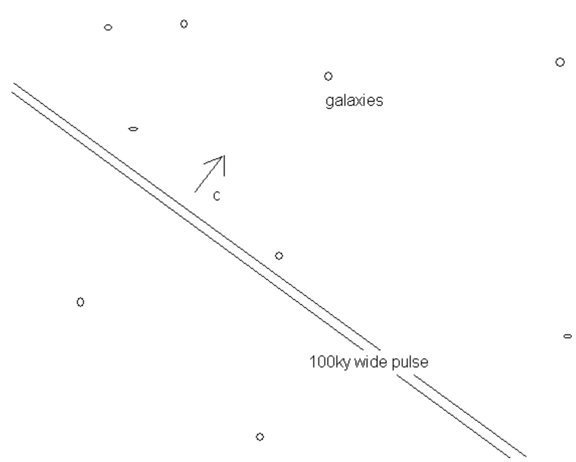


Figure 4 2df red shift survey, galaxy distance from earth, first red line~600mLY

2df red shift survey, galaxy distance from earth, first red line~600mLY

The (small) $\Delta\varepsilon$ quantized metric effect is washed out (in 2df and Sloan surveys) by random galaxy gravitational interactions (except in the halos of stable spirals, section 23.4) but the ε quantization is too large to be washed out here. Thus the triplet ε quantization (due to object C) is seen in the red shift surveys, is the light blue curved lines in figure 23-11. Note the metric change is nearly instantaneous over the whole cosmos which is an example of the dt=0, dr=large extrema of ds in figure 1-1 giving a phase change in equation 4.11a in $\kappa_{oo}=e^{i(2\varepsilon+\Delta\varepsilon)}$ since it is a ordinary time dependent quantum jump as seen at $r>r_H$. This is a QM phase propagation contribution inside this exponent in κ_{oo}, not a group velocity, so no energy is being propagated across this object at these $dr/dt\approx10^{40}c$ velocities (explaining fast gravity contribution at least as seen locally). One analogy would be a light bulb turned on inside a spherical room illuminating all parts of the room simultaneously. The observable effects (e.g., more rapid star formation at the eq.22.1 Gibbs phenomena jump) however do propagate outward at c giving the appearance of a spherical shell around our particular location as in, great walls in 2df survey, etc.,. All x,y,z points would then experience this same illusion of being at the center.
One interesting consequence is that the huge scale outside observer sees this 10^{40}Xc phase velocity as a real, very near c, velocity, with resulting huge Fitzgerald contraction. If his clock runs the same rate as ours he sees this (10^{40} times larger) universe to be as small as we seeours. So the universes are all *observed* to be the *same size* at all fractal scales!
Given this same size there truly is then only ONE observable object (given by that new pde, equation 2) as in equation 4.14.

Few Galaxies Lit Up At Any One Time

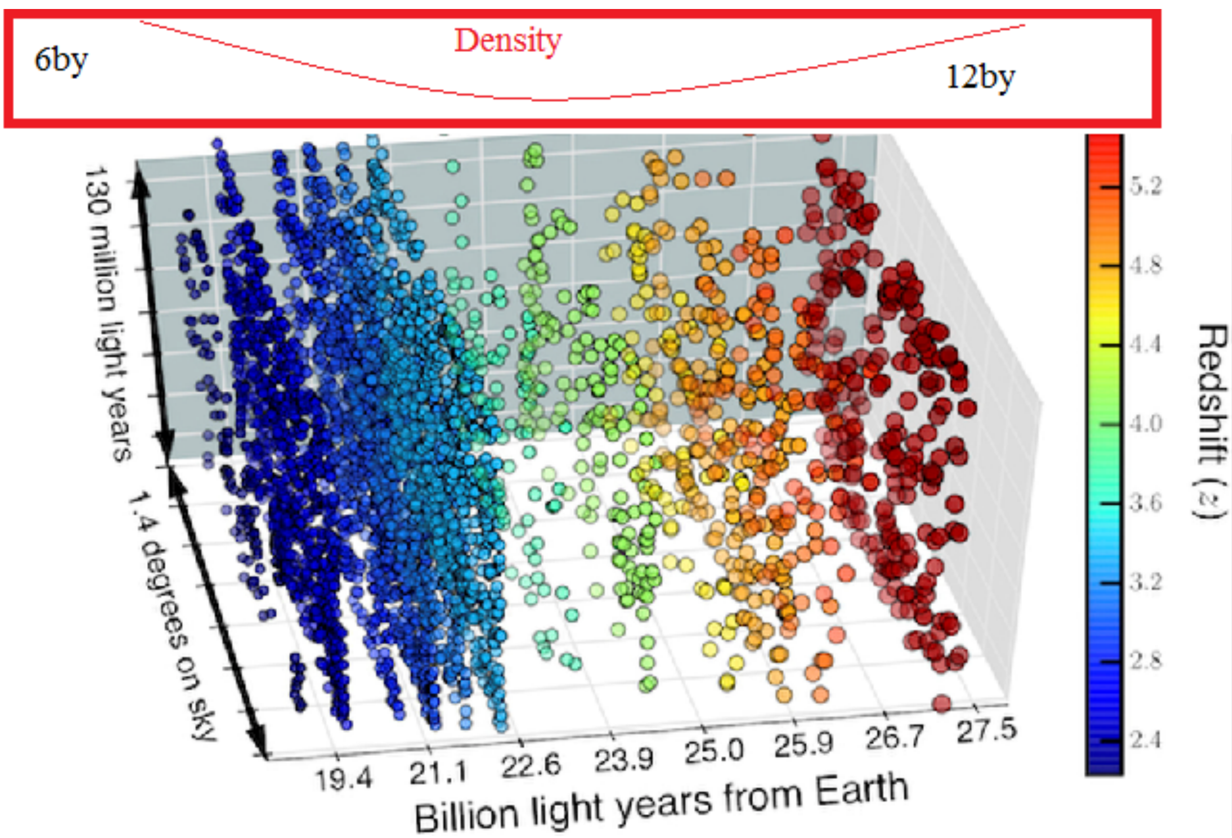


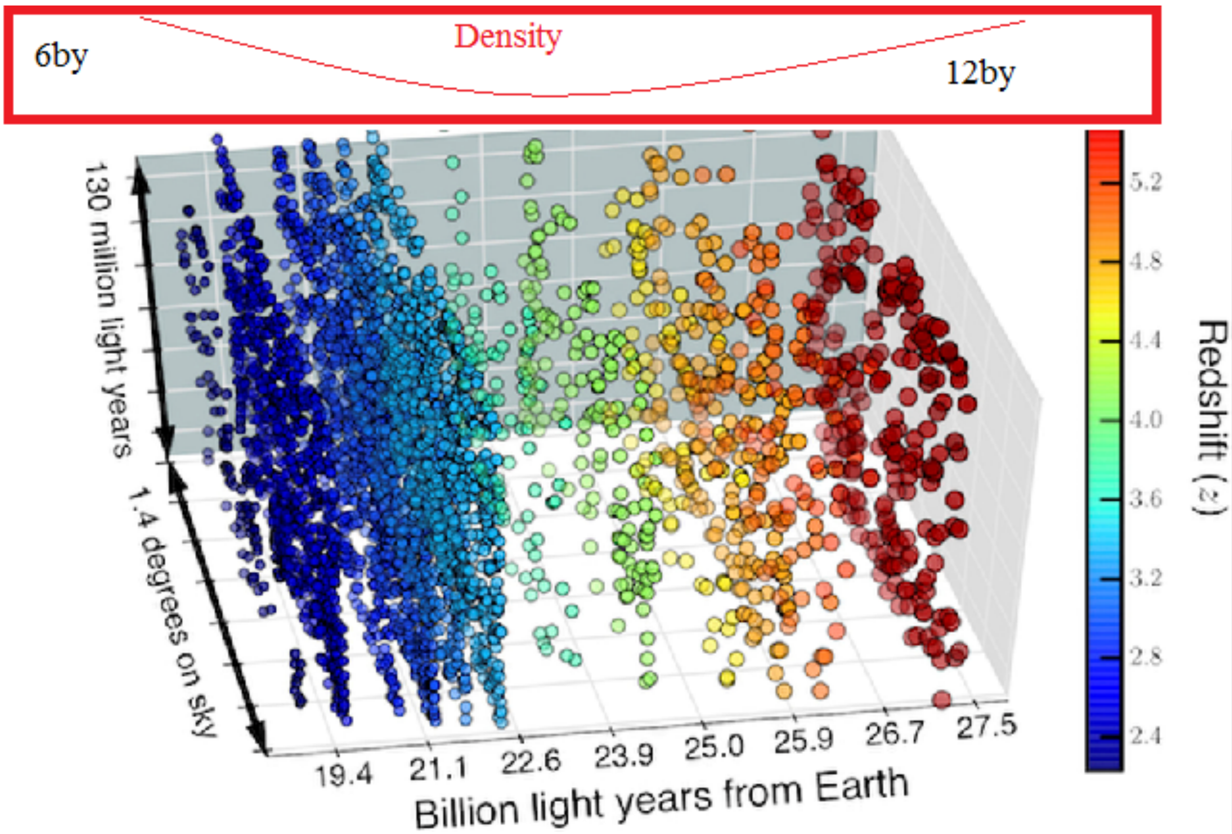
Note that outside r_H we use the standard Dirac equation operator - eigenvalue formalism. Let's say we solve the Schrodinger equation (a nonrelativistic limit of the Dirac equation that equals $\hbar/2m)d^2\psi/dx^2+V\psi=E\psi)$ for eigenfunctions ψ. We then do the eigenvalue= $\int\psi^*OP\psi dV$ =expectation value where OP is a typical quantum mechanical OPerator such as energy (H) or angular momentum (L) for which we apply the operator formalism $p_x\psi=-i\hbar(d\psi/dx)$ also. As an example recall that the Hamiltonian H is the time development operator $H\psi=-i\hbar d\psi/dt$. Here $(e^{iHt})\psi=OP\psi$. Note the time development assumes the Dirac particle is a point, so that the change in state happens over the whole particle all at once even if you approximated it to be a "small" point.
So what happens inside r_H? *The same thing!* The change in energy level for example due to the outside dynamics happens over the whole particle all at once. Also inside $r<r_H$ we have that

$dt=dt_o\sqrt{(1-r_H/r)}$ is imaginary so the time development operator is not oscillatory anymore, gives decay e^{Ht} attenuation. The metric inside is also the same H as the outside H but given the energy level changes with this e^{Ht} attenuation we then go through the
sequence of energy level changes of the outside state! Note *we have not assumed a superluminal movement of the metric quantization change here.* We have just applied the outside r_H quantum mechanics to the inside r_H.
So what does the outside observer infer for the inside region QM operator changes? The $dt'=dt_o\sqrt{(1-r_H/r)}=0$ for $r=r_H$ so that dr/dt' = infinity for inside propagation from his frame of reference. Thus there is Gibbs effect attenuation of the square wave higher frequencies.

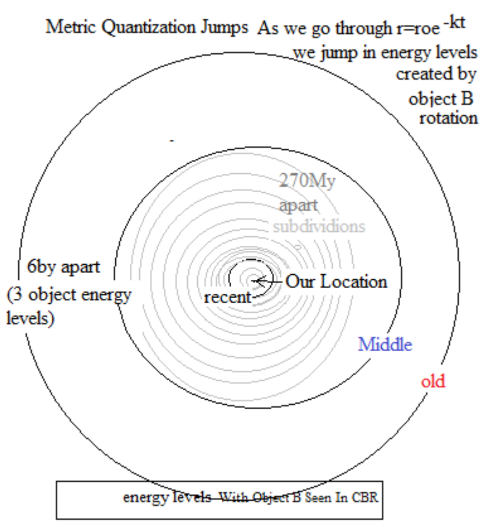
In any case **the *inside observer* need not worry about superluminal propagation of metric changes:** you simply apply the outside quantum mechanics self consistently to the inside and find that the inside r_H metric jump changes occur all at once.

SHM States caused By object B

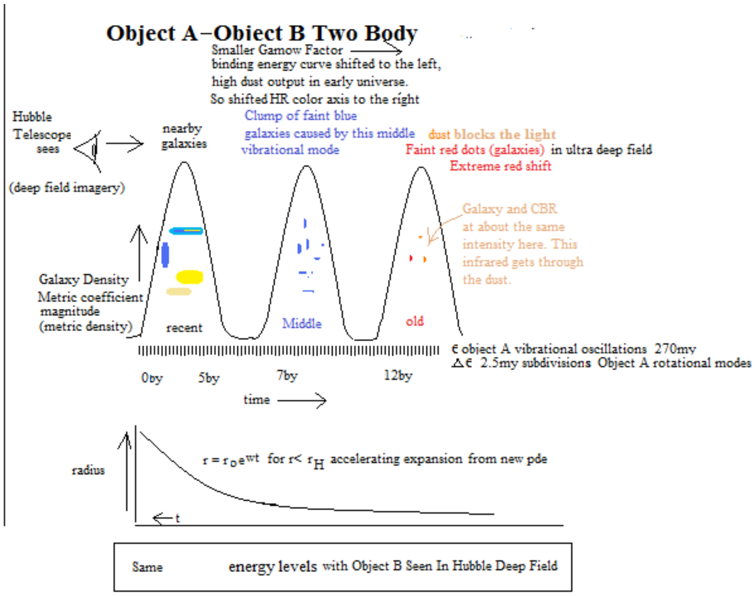




6by
Density
12by
130 million light years
1.4 degrees on sky
19.4
21.1
22.6
23.9
25.0
25.9
26.7
27.5
Billion light years from Earth
5.2
4.8
4.4
4.0
3.6
3.2
2.8
2.4
Redshift (z)



Metric Quantization Jumps As we go through r=roe -kt
we jump in energy levels
created by
object B
rotation
270My
apart
subdividions
6by apart
(3 object energy
levels)
recent
Our Location
Middle
old
energy levels ~~With Object B~~ Seen In CBR



Object A−Object B Two Body
Smaller Gamow Factor
binding energy curve shifted to the left,
high dust output in early universe.
So shifted HR color axis to the right
Hubble
Telescope
sees
(deep field imagery)
nearby
galaxies
Clump of faint blue
galaxies caused by this middle
vibrational mode
dust blocks the light
Faint red dots (galaxies) in ultra deep field
Extreme red shift
Galaxy and CBR
at about the same
intensity here. This
infrared gets through
the dust.
Galaxy Density
Metric coefficient
magnitude
(metric density)
recent
Middle
old
ϵ object A vibrational oscillations 270my
Δϵ 2.5my subdivisions Object A rotational modes
0by
5by
7by
12by
time
radius
$r = r_0 e^{wt}$ for $r < r_H$ accelerating expansion from new pde
t
Same energy levels with Object B Seen In Hubble Deep Field

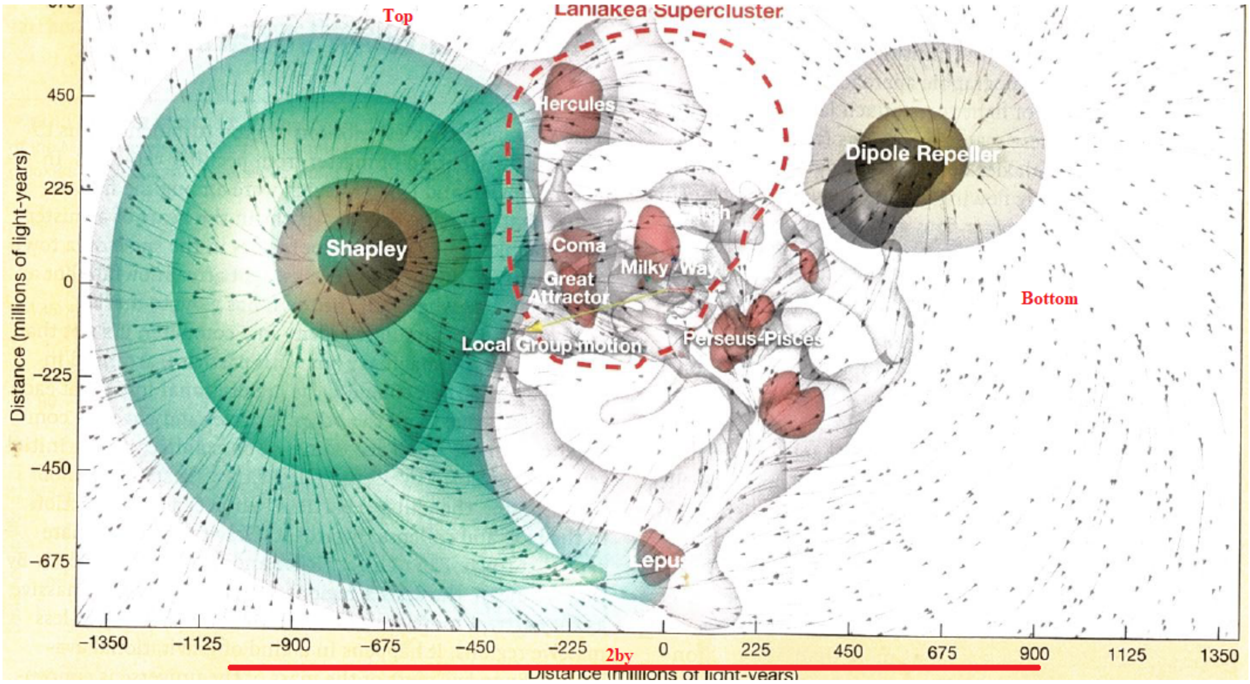


Fig.5 Noam Lebeskind.
The Shapely concentration is the compressional part and the dipole
repeller the expansion part of that 6by vibrational wave from object B. The Shapely concentration is the compressional peak of the 6by wave and the great void of Eridanus the rarefaction low of that wave. The 270My oscillations are the smaller voids. The 2.5My oscillations are the key to understanding the scale of galaxy formation
Note the vibration eigenfunction above right. The rotational was the ε which the great walls of the many voids. When the outside observer sees the contraction starting the inside (r<rH) must begin contraction also so the sign of w in $r=r_oe^{wt}$ for the interior observer must change. Thus the red shifts change to blue shifts at this time. Object B is ultrarelativistic with respect to object A so it has a much higher observed zitterbewegung frequency. So object Bs zitterbewegung oscillation frequency is seen to much higher than object A s frequency. Object C gives same zitterbewegung period as object A so not observed separately. Object C gives that 2.5My metric jump (Ch.23) due to moving through rotational eigenstates. There is one object B metric jump period every 6by and so 60 such oscillations in the past 370by. So (1/3)1836≈600; 600/60=10 and so 10X370=3.7≈ 4 Trillion years before our own contraction, when the red shifts change to blue shifts.
Note there are three motions going on at once here. The first motion is the $r=r_oe^{kt}$ object A zitterbewegung expansion inside r<Compton wavelength (fractal-cosmological). This motion ends at $r=r_H$ 4trillion years commoving time. The expansion then turns into a contraction. The second motion is that (above) 6by zitterbewegung oscillation of the object B plate superposed on top of that $r=r_oe^{kt}$ expansion. This yields a peak of galaxy numbers at 6by and 12by. There is also a stair step (object B rotational quantum state) metric quantization effect at 270my with Gibbs jump down and jump up (freeze and then bake) of 100k years duration.
violating baryon conservation since from the fractal theory these objects originated from a previous collapse.
Perturbative Limit

The Bullet Cluster collision, Abell 520 collision and Galaxy cluster CL0024+17 collision gravitational lensing maps (Hubble space telescope) all illustrate the excited S states resulting from galaxy cluster collisions. Note the spherical 1S and 2S states that result.

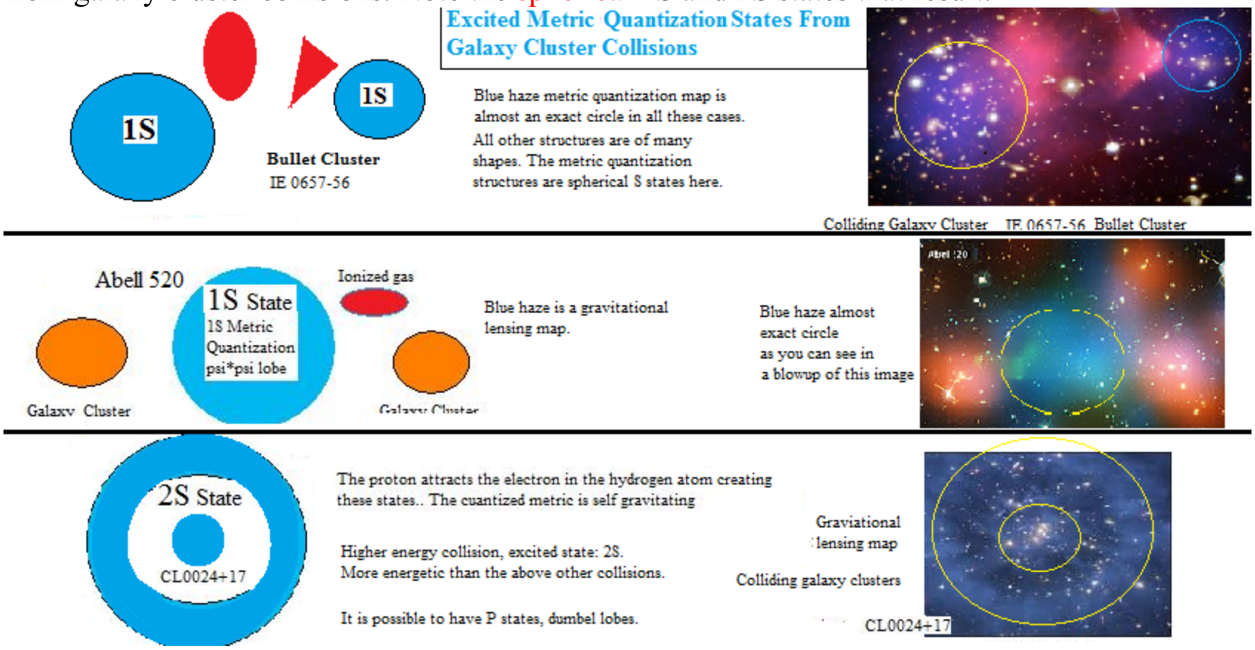


Fig.6

Also the central black hole of one or the other of one of these colliding galaxies would no longer be in resonance (next section) with the now new ambient metric and so it could suddenly "turn on" a jet to come to the correct equilibrium mass.

Also metric jumps out in the halo transition between galaxies would have the effect of clearing those regions of stars, especially of globular clusters. Also black hole jets would suddenly terminate at metric jump boundaries as apparently M87 s does. 1S sphere, 2S sphere-ring and sigma bond metric quantization between groups of galaxies exist also. This sigma bond metric quantization connection also explains the large strings of galaxies (in analogy with long molecules).

So we can set $2GM/rc^2= \Delta\varepsilon$=to get the effective mass M that $\Delta\varepsilon$ represents at a galaxy halo distance r. But note that for centripetal force $mv^2/r=GMm/r^2$ so that $v^2/c^2=GM/rc^2 =\Delta\varepsilon$. Thus if $\Delta\varepsilon$ is constant so is v^2 which is seen in the flat parts, especially at large distances, of the curves in above figure 7. We can also compute v^2/r at 60kLy and get $(261\text{km/s})^2/60\text{k ly}=1.22\text{X}10^{-10}\ \text{m/s}^2$ $\approx$1 Angstrom/s^2 (ala Mond who just adds this to 'a' in F=ma (Milgrom, 1983) which stays the same ratio at 15k ly which is set by the $\omega^2 r_o \sinh\omega t$ equation (2nd time derivative of eq.1.11) acceleration of the universe. Local gravity sources are quantized as well as in $2\Delta\varepsilon=v$ in $a=v^2/r$ goes up by $2v\text{X}2v/r=4v^2/r=$ 4X1.2 A/m^2=5A/m^2 which is the galaxy bulge and anomalous pioneer 10 & 11 accelerations (if that radioisotope thermoelectric solar sail effect is considered as well(which itself is 5A/m^2).

Note as t increases and if n is finite (so Gibbs jumps) this function goes up in a stair step fashion with time with each Gibbs jump increasing the integral. These are the metric jumps giving the quantization of the redshift. Note that the galaxy hubs (including black holes) gravity jumps rapidly at jumps transmitting a pressure wave radially from the center. Thus star formation is more rapid at these locations. Also Hubble dark matter maps seem to show a constant density distribution more indicative of a quantized metric source of this effect than what seemingly random distributions of dark matter are capable of. **So there is an enormous amount of evidence for a quantized metric and for there being NO DARK MATTER!!!**

12.3 Metric Quantized Stable Quantum States

Case II Recall from the first part the result of mixing the states:

$i\varepsilon e^{-(\Delta\varepsilon/\varepsilon)} = i\varepsilon(1-(\Delta\varepsilon/\varepsilon)+\Delta\varepsilon^2/\varepsilon^2-\Delta\varepsilon^3/\varepsilon^3-..)$ (13)

Note from equation 13 that the metric quantization mixed state is:

$$(|\varepsilon\rangle+|\Delta\varepsilon\rangle)/\sqrt{2}\equiv|QM\rangle,$$

But ε is a Fermionic state and Δε is a Fermionic state.
with the |QM> the singlet ↑↓ state with double the values of v.
given the Fiegenbaum point there is a slight helicity to the background metric since the Riemann surfaces from $dz=dse^{i\theta}$ are exact fractals at $-\sqrt{2}$ that puts a ε term in the ds^2 reparameterization equations thereby adding a tiny helicity onto the object B ambient metric. Having two such opposite spin "S' states however restores the spin 0 zero net energy to the vacuum. Recall the S states in QM are filled stable states, just as are the p states with their chemically stable Nobel gases.
So the most stable |QM> state is

100km/sec -> **200**km/sec (majority of galaxy halos) ↑↓ S state
1km/sec -> **2**km/sec (the sun's equator) ↑↓ S state
10m/sec -> **20**m/sec (Mesocyclonic and other..) ↑↓ S state

So the spin 2 metric background metric has a spin ½ component that cancels in most cases to a singlet and so allows classical General Relativity (GR) theory to work.

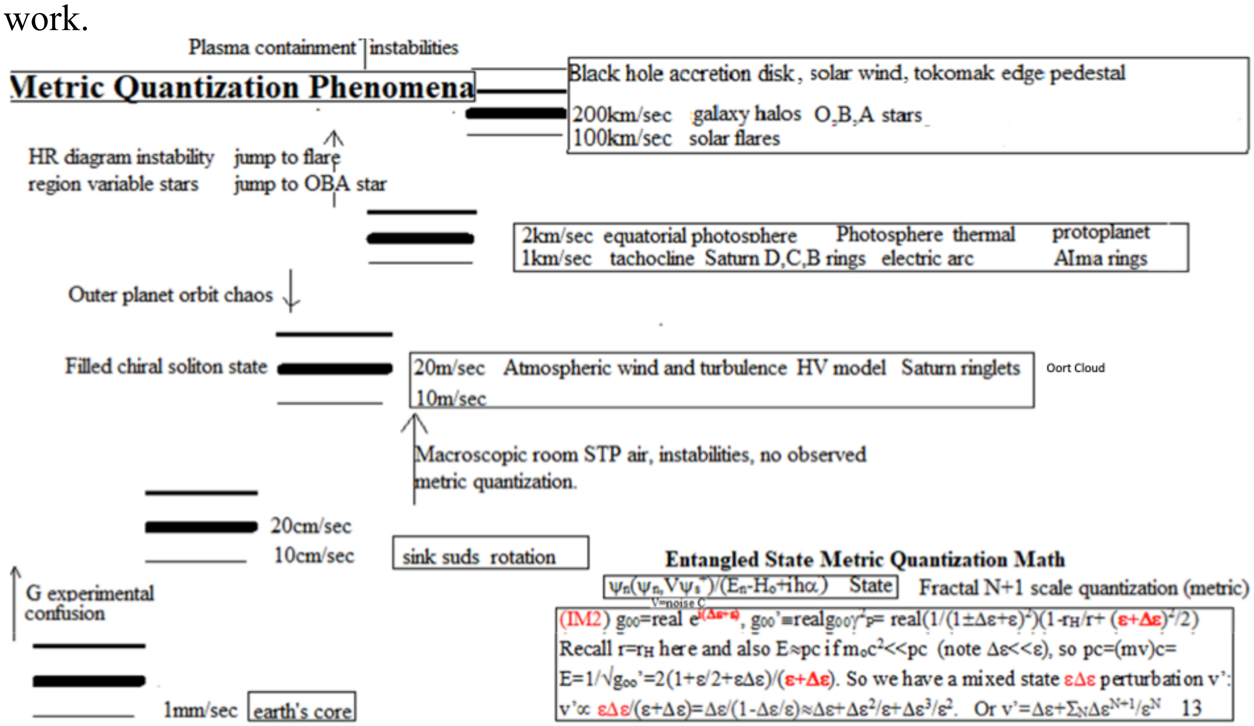


Fig.7

But spin2 means another “pedestal” of stability ↑↑↑↑ implied by GR itself so that 4(100km/sec) is yet another stable level, See DIII QDB tokomak result below.

Laboratory Measurements Of Metric Quantization

If you run an electric arc at very high amperage you get an ordinary Maxwell Boltzman distribution for the output molecular speeds. Note the envelope of the graphs below are approximately Maxwell Boltzman. But if you lower the current to the point the arc is just about to go out (Here below at 100Amp) you find that these interesting energy levels show up. Note the abscissa is in eV so I had to obtain v by setting delta(eV)X($1.6X10^{-19}$)=(1/2)mv^2 where m=MWmp=MW$1.67X10^{-27}$ and MW stands for the Molecular Weight.and delta(eV) means the difference in eV from peak to peak.I had to use the molecular weight of silver and zinc to find those velocity intervals.

Recall the 1km/sec represents stability regions in my metric quantization theory..

“In as much as the current stabilizes the arc, it can be assumed that the energy distribution of the ions is connected with the instabilities of the arc”

The same can be said for the “stabilities of the arc”.

Maximum speed of LS was 1km/sec. LS is brass.

271828

Soviet Physics,JETP, Vol.20, No.2, February 1965, Plyutto

High Speed Plasma Stream In Plasma Arcs

Note you have the same separation in velocities for both zinc(Zn) and silver(Ag) .

But silver and zinc have different quantum energy levels and so clearly this 1km/sec effect is not associated with their energy levels, it is something *more universa*l. Recall we also see a N100km/sec effect in tokomaks.(there N=3)

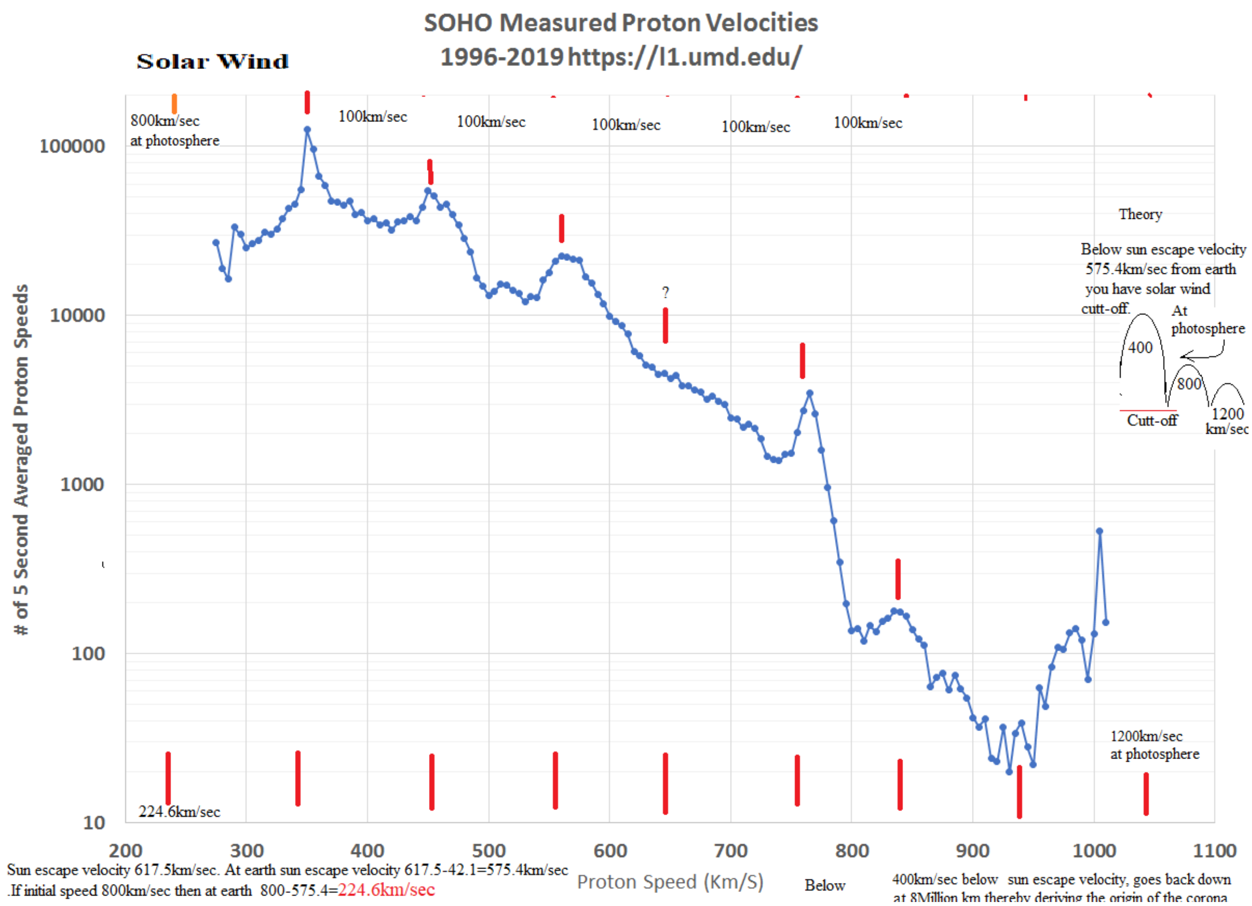


Fig.8You probably are wondering why you can't observe metric quantization in your living room for example given that the air in it is also a grand canonical ensemble. The reason is that the next lower metric quantization speed is 20m/sec which for liquid helium4 gives us 0.065K which is difficult to observe (room temperature is around 300K). Helium4 is the only material still liquid at these temperatures and so it can still be in a grand canonical ensemble.

You could ask why this metric quantization velocity "impeding" effect is not seen in accelerators as some new kind of 'impedance' or something as they are ramping up the speed of the particle. First of all in relativity velocity is relative so we must specify a COM frame as we do in quantum mechanics where we have the usual quantized KE energies (eg.,$1/N^2$ Rydberg energies) and so $v=\sqrt{[(2/m)KE)]}$ “quantized” average velocities as well. Secondly the quantization levels fizzle out for masses much smaller than the sun’s mass (eg.earth). Also as we move in the earth’ orbit and rotate as well so no such velocity will be easily observable anyway. Most importantly the conservation of energy must be used. So if in a natural system (such as at the tachocline) there are several types of energy the velocity will be held constant and the energy transfered to one of the other types as in that tachocline example. Note you then still conserve energy. In the accelerator on the other hand you have only that accelerating energy so to *conserve energy* the particle must move right through the metric quantization velocity as though it was not there. The same applies to space craft motion. In these high temperature laboratory plasmas the effect would most certainly be in the noise in comparison to all the chaotic instabilities. The velocity quantization is in fact nearly all smeared out in the hubs of galaxies due to the many surrounding mass perturbations. A 2014 edition of

Physics Today magazine said that the value of Newton's gravitational constant G is currently only known to **3** significant figures (somewhere between **6.672** and **6.676** $X10^{-11}Nm^2/kg^2$), really no significant advance beyond what Cavendish himself measured in the 1700s and a typical experimental error the students would have gotten in one of the many physics labs I used to teach! The problem is not in the experiments themselves which are accurate to around 20ppm-40ppm (even given torsion calculation uncertainties). The problem is in the spread of the results of these several very accurate, precise experiments.

In my view metric quantization is the problem here especially with the experiments that require a moving oscillating torsion bar to measure the torsion constant, where we can then have a grand canonical ensemble with nonzero chemical potential (as in Saturn's rings), the requirement for that metric quantization to effect relative speeds and here mess up the torsion constant calculation and therefore the G calculation. By the way the new experiments, with no such motion requirement (e.g.,floating the balls in mercury), will probably finally nail down the gravitational constant.

Note that these pendulum speeds are far less than 20m/sec and so must be responding to much smaller metric quantization sources than object B, object C, object D and the Milky Way galaxy. The Sun and earth are the next likely candidates for even smaller metric quantization speeds, where we even go to the ***continuum limit*** (eg.,what about your desk?).

16.10 Red's Law Of Metric Quantization

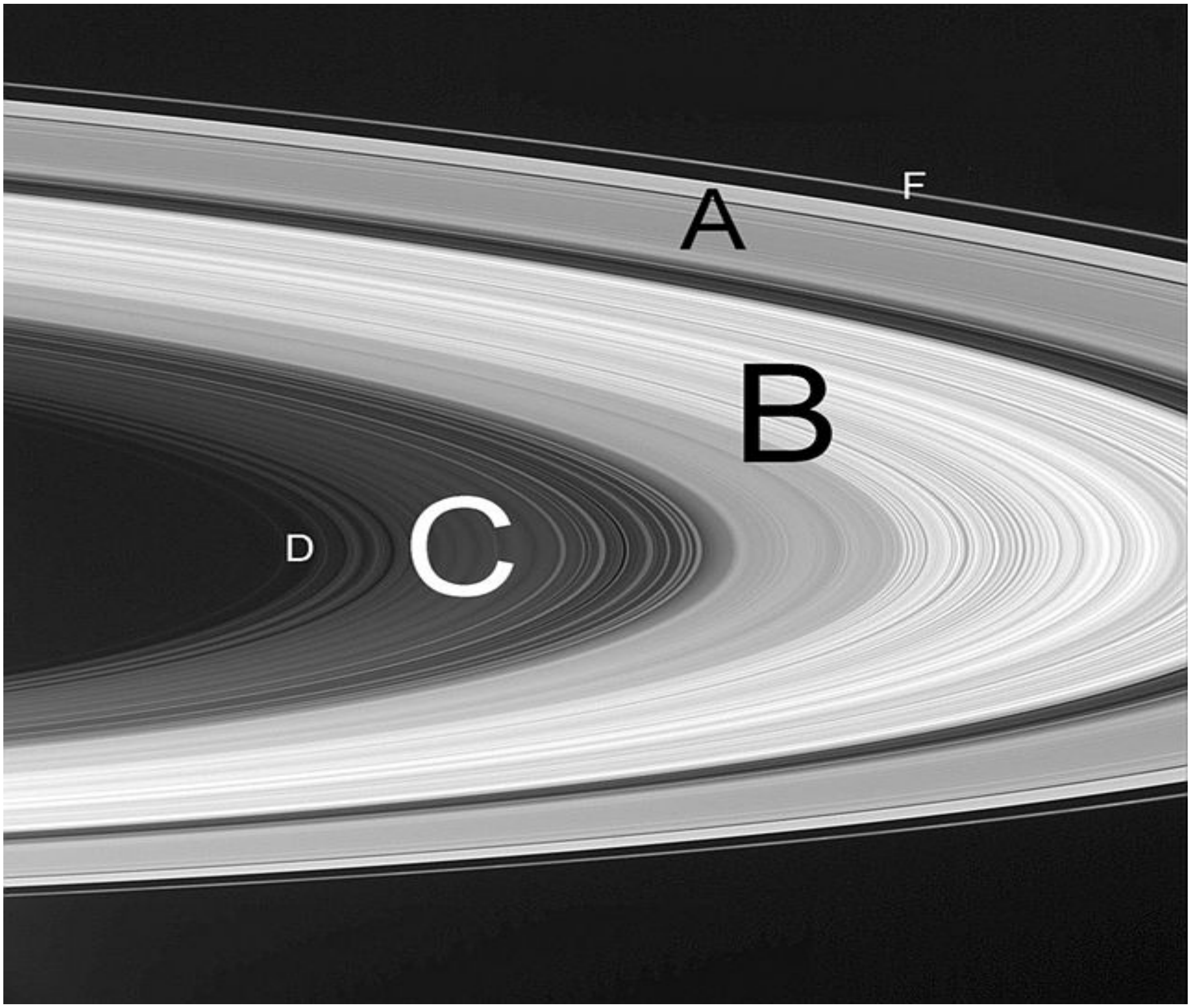
$(1/\pi)^{2n}$ =velocity amplitude of metric quantization

$(1/\pi)^{-2n}$ =time interval of metric quantization

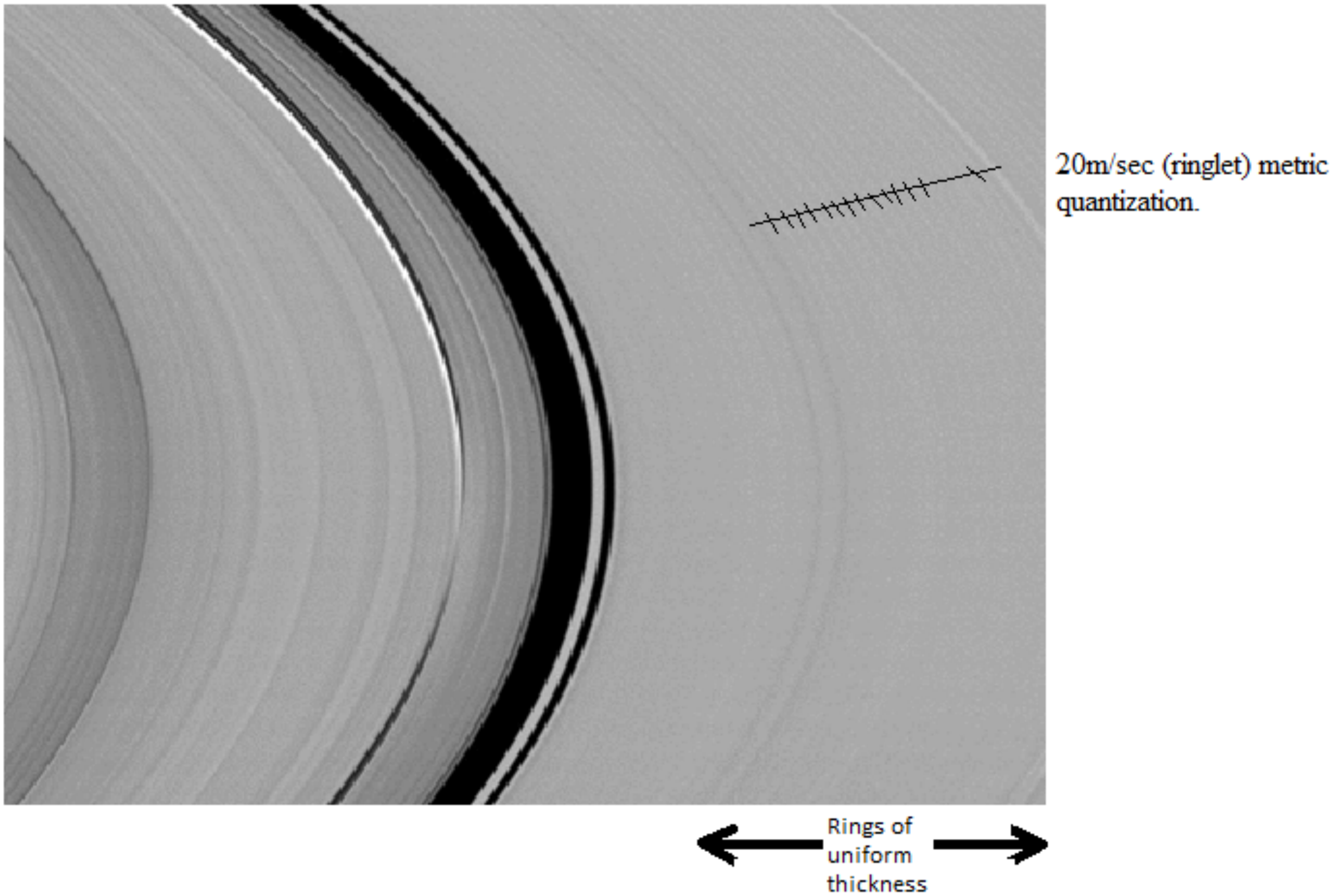
n=0,1,2,3

velocity:	n=1 v=20m/sec;.	n=2 v=1km/sec;	n=3 v=100km/sec,	n=4 v=c/3
time interv	n=1 100ky	n=2 2.5my;	n=3 270my	n=4 4by
phenomena:	cold cycles	Pacific volcanic cycles	Mass extinctions	Dust
phenomena	ringlets	rings, sun convection zone	great wall	Faint blue galaxies HDF
phenomena	ice ages	chaotic Oort cloud	galaxy halo speeds	Faint red dots HDF
			O,B,A rot, , coronal temp.	

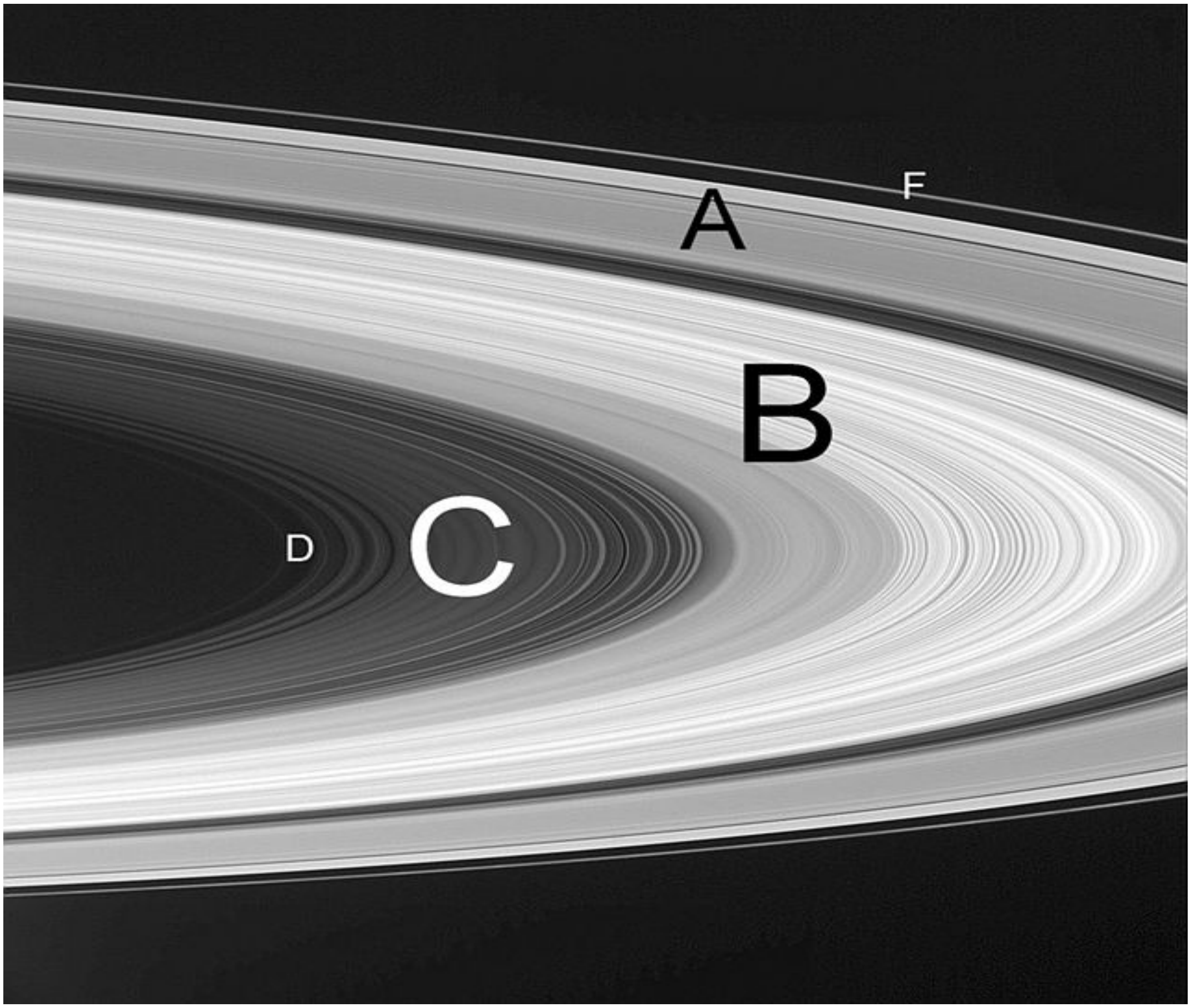
HDF =Hubble Deep Field



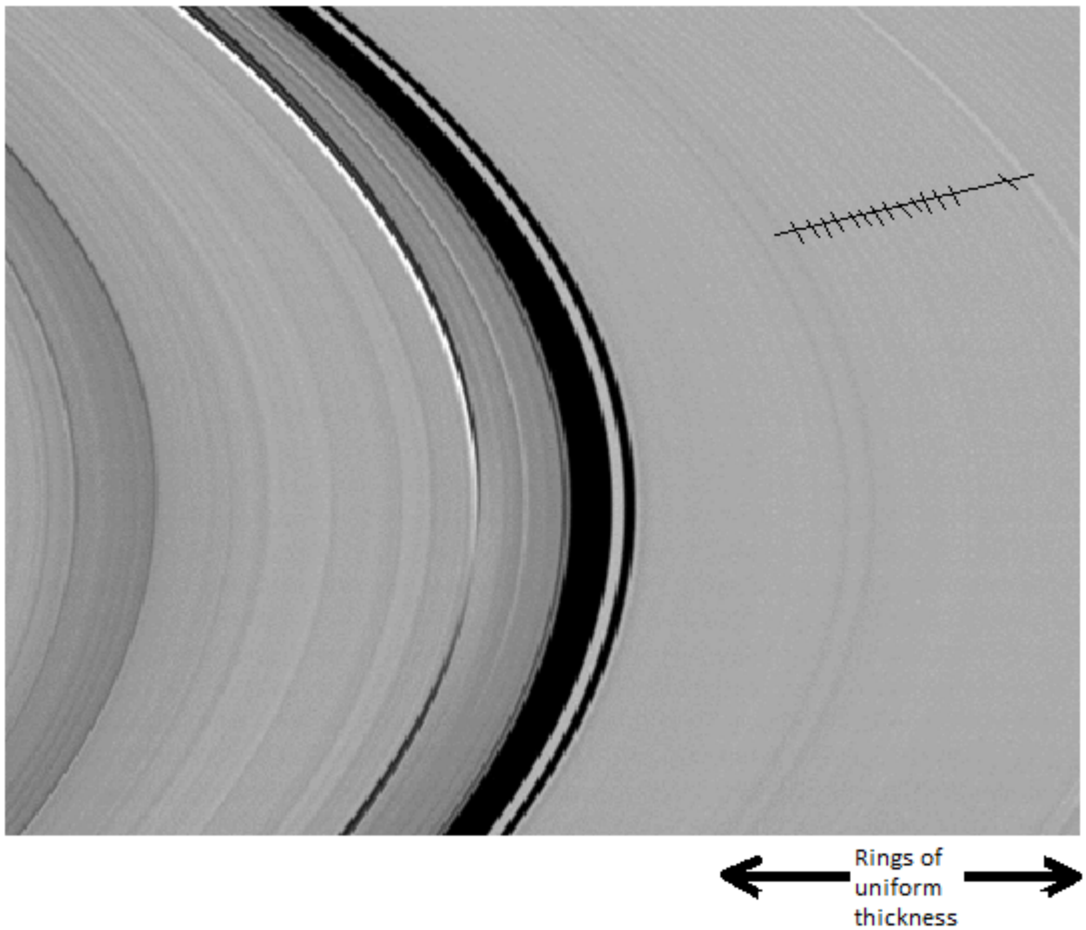
In the most detailed Cassini image of Saturn, there are 5 narrow rings, 8 2X widely spaced rings in the D ring: there are few shepherding moons here, the Roche limit will pull apart just about any big object here, *You see two levels of metric quantization in the D ring*. What an awesome sight, metric quantization in the raw**, as explicit as it could be!!!**
The speed of each consecutive inner ringlet increases by that 1km/sec (the outer D ring has 2km/sec metric quantization) of object C quantized metric value that also created Bode's law and the rotation of the sun's equator.
Also the velocity difference between perihelion and aphelion for the earth is .98km/sec very close to the metric quantization value, the key to its orbital stability, just as with those rings. This explains why there was enough time for life to establish itself on earth, so explains why we are here.



20m/sec ringlet quantization



1 km/sec differences be outer edge of D to C;   C to B and B to A.



Close up Of Ringlets (20m/sec Metric Quantization

In a close up image of these small ringlets, visible in image, it is noted that
There appears to be no new subdivisions implying 20m/sec is the smallest metric quantization (after the 100km/sec, 1km/sec) and no smaller metric quantization exists. The neutron 2P ½ state electron at the poles of the 3 particles of the 2P3/2 state would have a plate interaction directly on it.
So this 20 m/sec must be caused by a more distant electron in orbit around this proton.
Thus we are in a isolated hydrogen atom in interstellar space.

Give dark shadow, main concentration, 1 unit, then the light empty region is 1/4..

$20 \frac{m}{sec}$

1 $\frac{1}{4}$

This 20m/sec metric quantization appears to be as small as it gets There is nothing but this 1 and also 1/4 quantized metric information in this ringlet data implying that object D is a electron in a hydrogen atom in interstellar space . This metric quantization appears to be caused by the groundstate and first excited Rydberg state hydrogen atom energies $1/n^2$: so 1 and 1/4.times the Rydberg number. This is nonmolecular hydrogen and also an excited state of hydrogen in interstellar space implying it is in a active star forming region or ionized gas region between galaxy clusters containing many black holes.

Thus this next larger scale fractal universe (or Reimann surface) is a mature but not extremely old universe, perhaps 6 billion years old in their years. In our years it would be $\sim 10^{10} X 10^{40} = 10^{50}$ years old making the next higher scale fractal object bigger than that one have an equivalent age of 10^{100} of our years, one google years old!

Appendix C

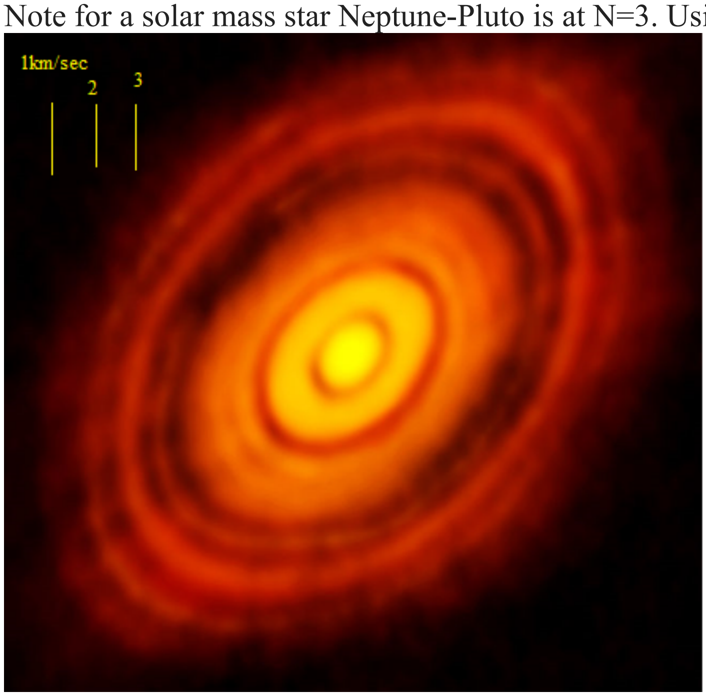
Recall the galaxy halo and O.B.A star 100km/sec (object B) and note the D ring **1km**/sec, C ring **2km**/sec and B ring **3km**/sec (object C) implying a kind of Pauli exclusion principle to these metric quantization states. But note also a new ringlet 20m/sec metric quantization. caused by the Milky Way Galaxy gravity and/or object D.

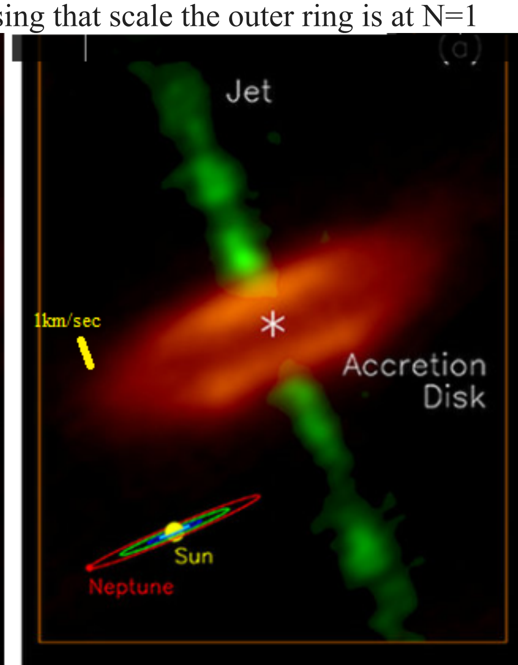
Recall I found that a combination of the Jupiter movement in going from perihelion to aphelion (10m/sec) and Saturn 2X effect (10m/sec) is ~20m/sec to get the solar cycle.

Apparently the stability of Jupiter's and Saturn's orbits and therefore the **solar cycle** itself also **depends on that (20m/sec) metric quantization!**

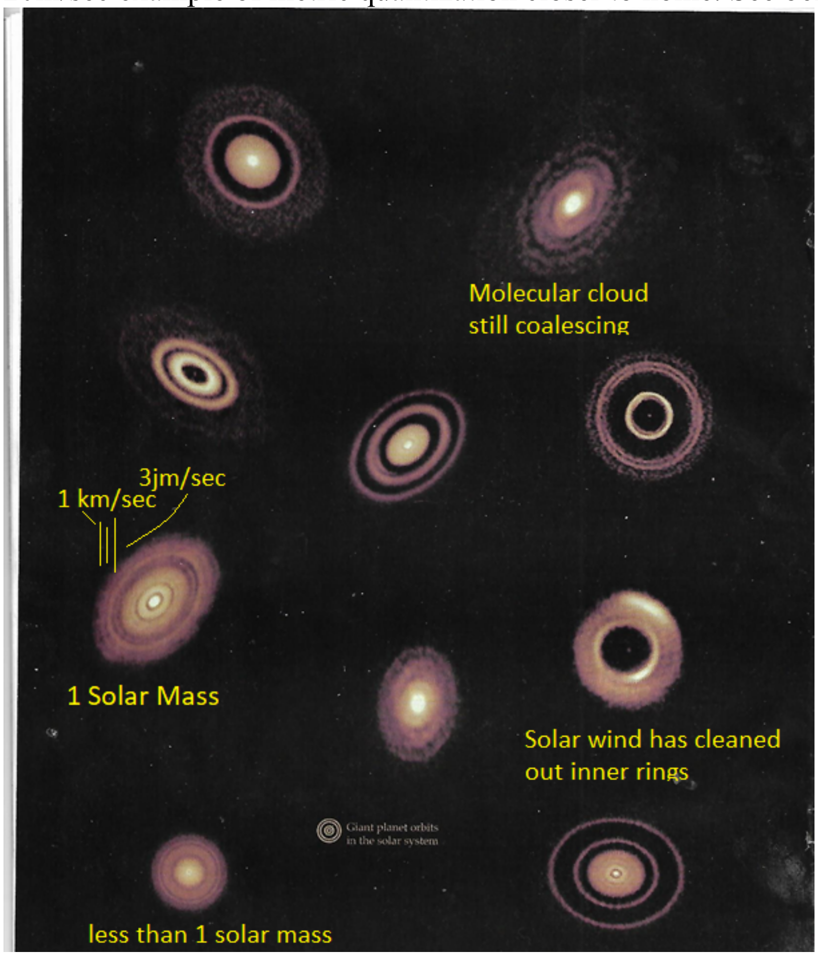
1km/sec Metric Quantization In Protoplanet Dust Rings

Note for a solar mass star Neptune-Pluto is at N=3. Using that scale the outer ring is at N=1





The 20m/sec metric quantization between the ringlets of Saturn. There may be yet another 20m/sec example of metric quantization closer to home. See below.



Alma images.

Recall from equation 13 (first attachment) there are those 100km/sec Δε, 1km/sec and 20m/sec metric quantization speeds. Recall from above that 20km/sec speed in those Saturn ringlets as a higher order term in my equation 13 for mixed states (i.e., grand canonical ensembles with nonzero chemical potential). Recall in equation 13 of the first attachment (section 1G of book) the 10meter/sec . $\Delta\varepsilon^3/\varepsilon^2$ metric quantization term.

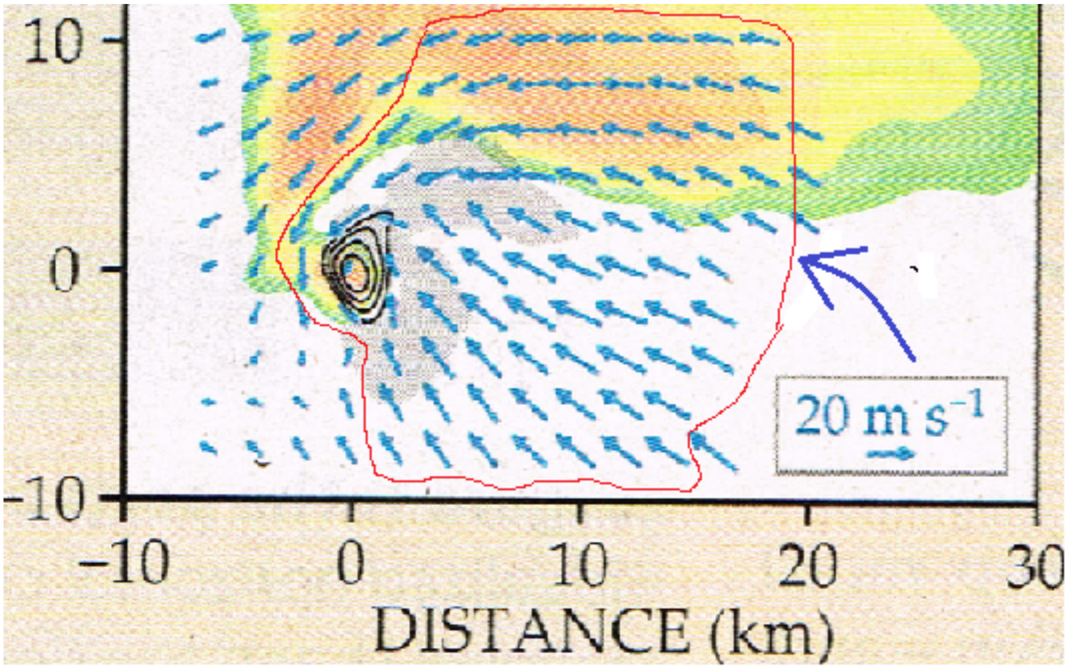
In that regard from a recent 'Physics Today' article on tornado formation (1)

"On tornado outbreak days, the wind shear can be so severe that the winds can vary by as much as **20m/sec** within the lowest 1 km". Also there is the statement in that article that for a supercell updraft , the vertical component of the vorticity, is on the order of 10^{-2}/s"

∇Xv=curlv=2w=.01. So w=.01/2=.005=v/r. If **v=20m**.sec then r=20/.005=4km =approximate supercell radius (attachment image) If v=10m/sec the r=10/.005=2km.

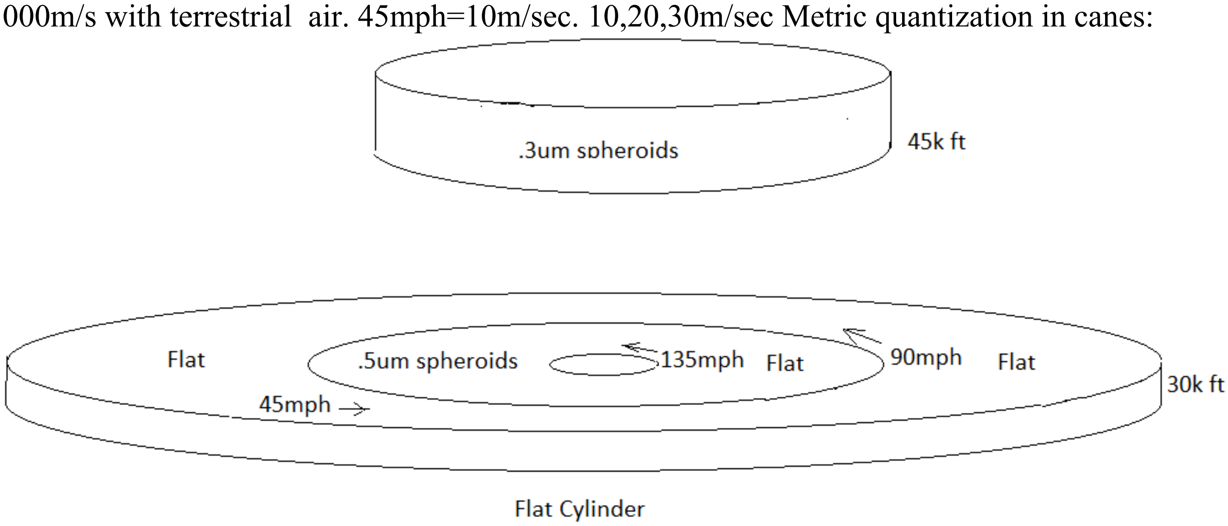
Also in the below VORTEX2 Doppler data (below figure) the WHOLE right side and half the smaller left side exhibits a **20m/sec** speed (the tornado is at coordinates (0,0)).

That 20m/sec value certainly has nontrivial implications for tornado formation.



(1) What We Know and Don't Know About Tornado Formation" Physics Today, Sept.2014

The lightning mapped out the metric quantization jump boundaries in Ian! In other words there is a radial speed discontinuity and so increased triboelectric physics going on there.
So there is the inner 135mph lightning (eye wall), the 90mph boundary lightning half way out and the (right) edge 45mph lightning
gives tornados their characteristic seismic signature that has even been used to locate their positions.
By the way the (above) tornado 20m/s metric quantization occurs in the accompanying mesocyclones (the huge cloud just above the tornado) and not in the vortex itself: can't get to 1000m/s with terrestrial air. 45mph=10m/sec. 10,20,30m/sec Metric quantization in canes:

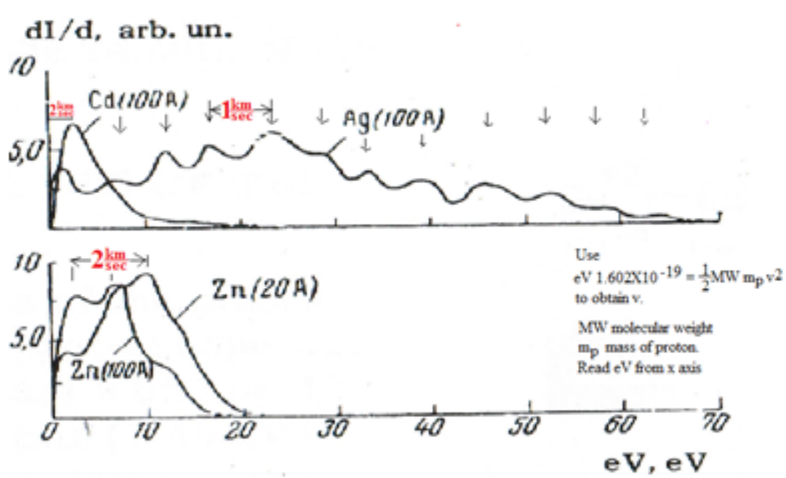


Metric Quantization In An Electric Arc

Recall metric quantization requires a grand canonical ensemble. A plasma moving in an electric arc can satisfy that criteria. In oneexperiment a 100Ampere silver (Ag) electric arc was produced. The apparatus had a device for measuring the distribution of ion energies inside the arc. Another experiment substituted zinc (Zn) instead in a 20Amp electric arc. If the metric was quantized at 1km/sec intervals stability regions of individual high streams in the arcs.in multiples of 1km/sec should be observed and they were.

Soviet Physics,JETP, Vol.20, No.2, February 1965, Plyutto

High Speed Plasma Stream In Plasma Arcs



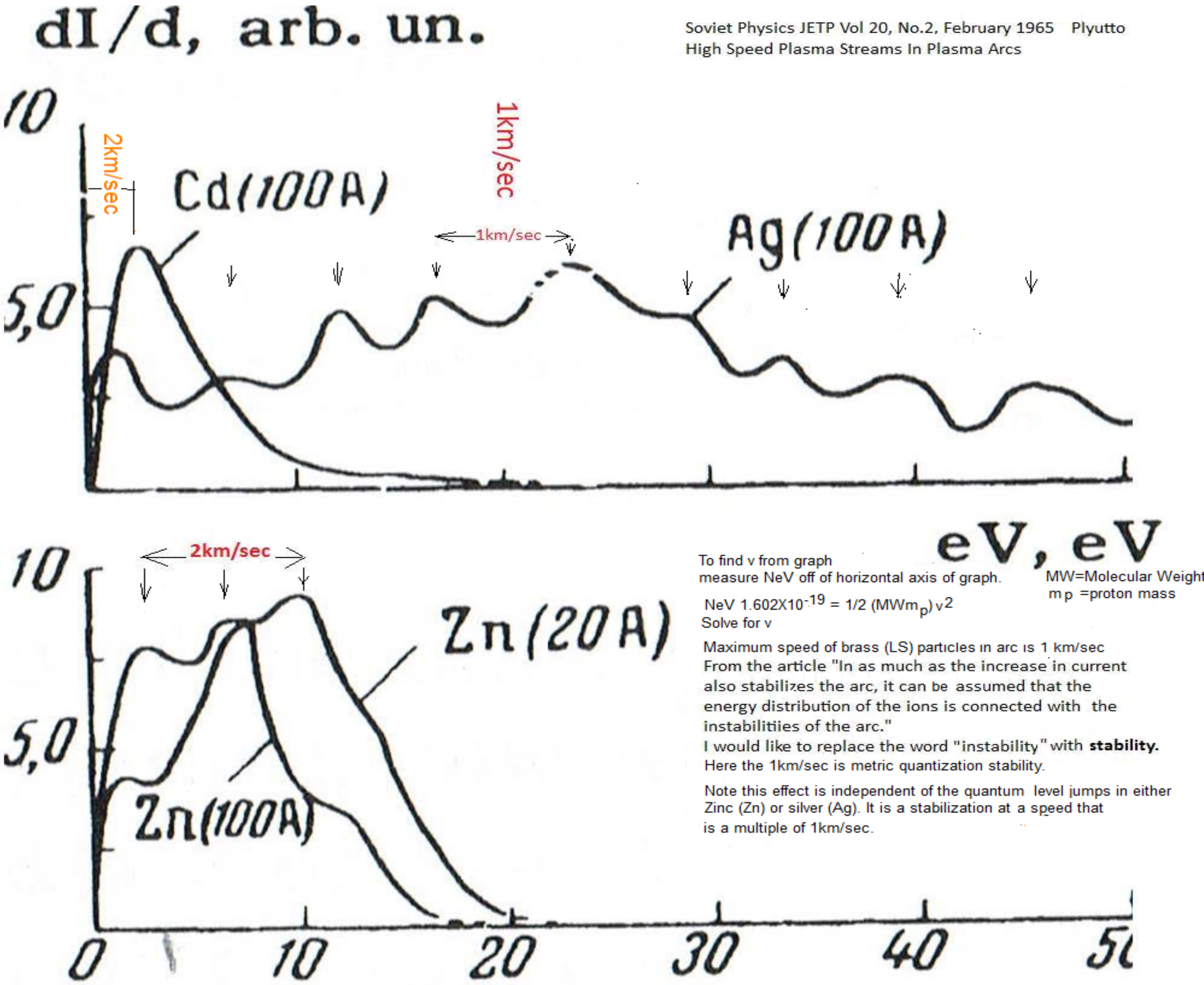
Recall the 1km/sec represent stability regions.

"In as much as the current stabilizes the arc, it can be assumed that the energy distribution of the ions is connected with the instabilities of the arc"

The same can be said for the "stabilities of the arc".

Maximum speed of LS was 1km/sec. LS is brass.

Soviet Physics JETP Vol 20, No.2, February 1965 Plyutto
High Speed Plasma Streams In Plasma Arcs



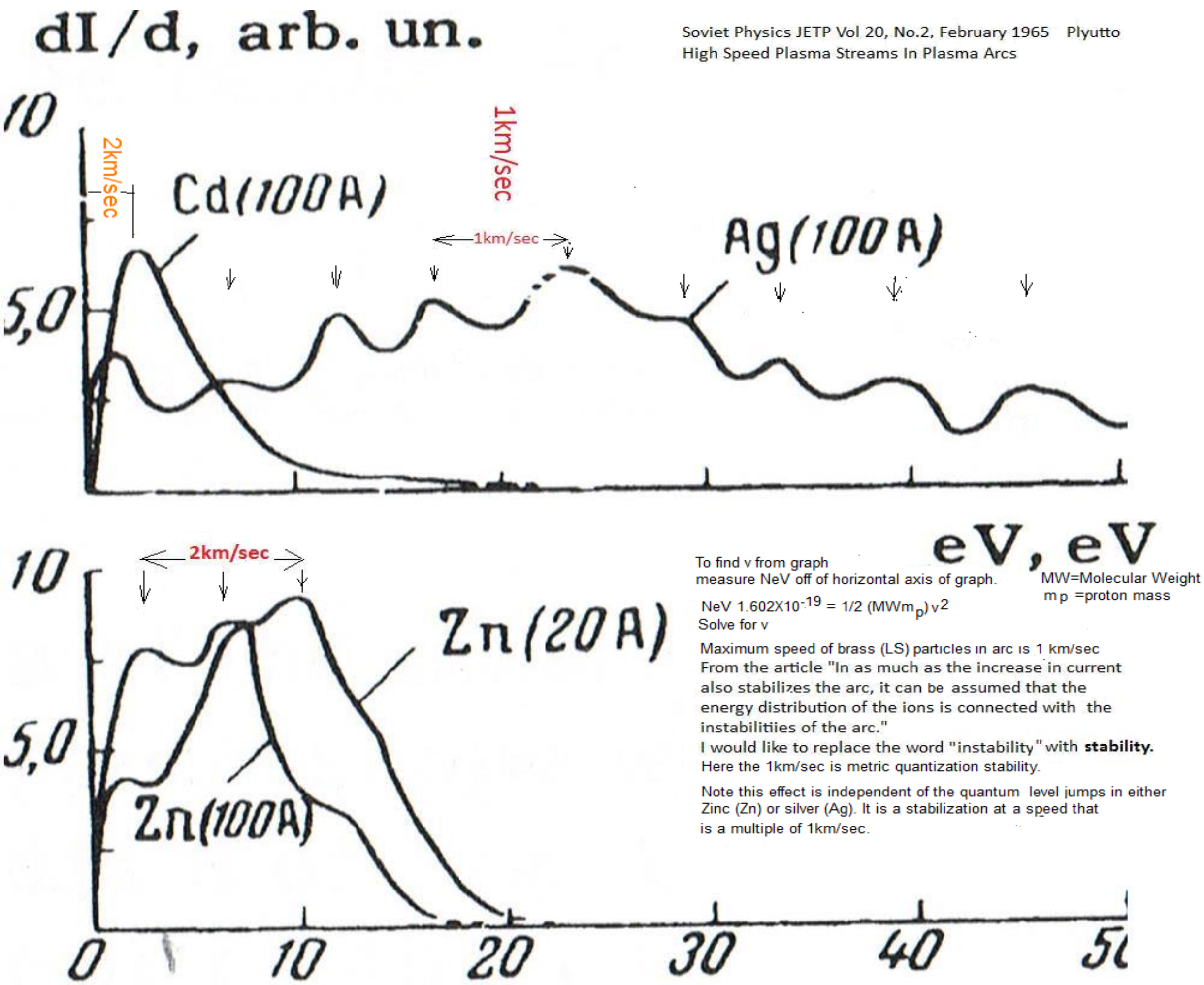
To find v from graph
measure NeV off of horizontal axis of graph.

MW=Molecular Weight
m_p =proton mass

$NeV\ 1.602X10^{-19} = 1/2\ (MWm_p)\ v^2$
Solve for v

Maximum speed of brass (LS) particles in arc is 1 km/sec
From the article "In as much as the increase in current also stabilizes the arc, it can be assumed that the energy distribution of the ions is connected with the instabilitiies of the arc."
I would like to replace the word "instability" with **stability.**
Here the 1km/sec is metric quantization stability.

Note this effect is independent of the quantum level jumps in either Zinc (Zn) or silver (Ag). It is a stabilization at a speed that is a multiple of 1km/sec.



Note you have the same separation in velocities for both zinc(Zn) and silver(Ag) .
But silver and zinc have different energy levels and so clearly this 1km/sec effect is not associated with their energy levels, it is something more universal. Recall we also see a 100km/sec effect in tokomaks.

Metric quantization has a big change in climate. It has been said that Milankovich cycles change the climate

Despite the advances in computer modeling, there are still some puzzling questions about the Earth's changing climate and the Milankovitch cycles. Geological records show that up to one and a half million years ago, Earth's climate was changing with the periodicity of about 100,000 years, said Maliverno. Such fluctuations would

shorter cycle, of about 40,000 years, which would reflect the changes in Earth's obliquity, the tilt of its axis. What caused this sudden switch is a complete mystery.

"It doesn't make a lot of sense, because the eccentricity changes are so small, and the resulting changes in the sunlight are so small that we wouldn't expect it to happen," said Deitrick. "So some climate scientists have argued that the ice ages perhaps have nothing to do with Milankovitch cycles at all."

Miscellaneous and unrelated to metric quantization:

Low gravity region centered on the southern tip of India.called IOGL

“The IOGL, as Pal and Ghosh argue in their latest paper, likely took its current shape roughly 20 million years ago “.

It was caused by a meteor hit 17 million years ago in the Southern Indian ocean the sent a shock wave to the other side of earth to form the Columbia River basalt fissures in Northeastern Washington.