23.3 Halo Velocity Dependence on Metric Quantization

Thus the cosmological redshift is quantized in units of 87km/sec an easily measured phenomenon if observing in a single direction. **"**Perhaps, as Tifft and his colleagues have suggested, there are unknown large-scale quantum phenomena in the universe for which we are only beginning to find evidence". **Reference:** "Quantized Galaxy Redshifts" by William G. Tifft & W. John Cocke, University of Arizona, *Sky & Telescope Magazine*, Jan. 1987, pgs.19-21 The 2df survey (and Sloan as well, SDSS) were automated surveys that did not visually inspect galaxies as being spirals or nonspirals or otherwise so a applicable statistical result is hard to come by in that case. But still the ε great wall is clearly visible (with the 3 object C walls visible as well) and the Δε quantization is clearly visible in the single spiral galaxy and single galaxy cluster data. Winds from starbursts actually form gas ionization halos that reach about 20 times farther into space than the visible size of the galaxy, to near the edge of the metric quantization region outside of which the gas experiences far lower gravity of the next lower metric quantization step. We can then see the halo region containing the fundamental metric quantization (e.g.,at 200km/sec) when the galaxy is in starburst activity since the gas held in that region is then visible through the ionization by ultraviolet radiation from these young blue O, and B spectral type stars in the visible disk of the galaxy. Recall to derive the quantized velocity we set g_{oo}=Rel($e^{i\Delta\varepsilon}$)=1-2GM/c^2 and mv^2/r=GMm/r^2 and solve for v. But we also need to augment these equations with the conservation of energy (considerations) that imply that a single particle entering the quantization region all by itself should not spontaneously change speed. But from astronomical observations it appears that *groups* of objects over time, after exchanging energy with other particles in their surroundings, eventually settle in on this metric quantization v.
But doesn't this also happen when a particle enters a thermalized gas (like in the room you are sitting in)? Eventually the particle ends up slowing down or speeding up in synch with whatever the temperature and statistical mechanical speed distribution of the ambient gas is e.g.,.,Maxwell Boltzman, Fermi Dirac or Bose Einstein. We then satisfy the metric quantization equations and also the conservation of energy.
Evidently then by augmenting our metric quantization equations with conservation of energy considerations we require that this derived v (from Rel($e^{i\Delta\varepsilon}$) squared is also the inverse temperature beta (beta=1/(kT) in a metric quantization partition function connected to it by **(1/2)mv^2=(3/2)kT**. That makes the partition function Z for metric quantization a trivial exp(constant) with the total probability of the microstate trivially 1.
There are interesting consequences of this partition function(ie.,that equating v^2 to a temperature). For example the plasma coming out of the sun does indeed jump into that 100km/sec metric quantization very rapidly explaining that high initial1MK corona temperature (the graph of corona temperature vs height almost resembles a *quantum jump* at this transition region. The standard explanation for the corona's energy source by the way is magnetic recombination). Interestingly some of those black hole jets appear to do the opposite when they hit the 100km/sec drop off, they abruptly slow down, splatter as you would then expect them to!
: That black hole jet splatter is then the inverse process of that abrupt corona heating!!
Planetary systems, Saturn's rings etc over *a lot of time* also interact with other objects (e.g., nearest neighbor planets) gravitationally and so can also (more crudely) be given this metric quantization "temperature". Thus they can also, after a long enough time, end up in a metric quantization v; that is unless there are sources of nonlinear thermodynamic perturbations (T is *not* then well defined) as occurs near the hub of the galaxy, a rocket launch into space or a

particle being accelerated in a synchrotron let's say. These mass eigenstates ξ are filled in by ε vibrational modes $\varepsilon(N+½)=E$ and object B rotational modes $\Delta\varepsilon\sqrt{(L(L+1))}=E$. Objects C and D contribute to the CKM matrix (sect.16.6, 16.6) and ΔE pairing interaction(sect17.1) eigenstates.

23.4 Quantization of Stellar Speeds in Galaxy Halos

Recall we have the additional $\Delta\varepsilon$ in $\kappa_{oo}=1\pm\equiv e^{i\varepsilon\wedge 2/(1\pm\Delta\varepsilon)}$ given object B is close to our object A. The entangled state solution $e^{i\varepsilon\pm\Delta\varepsilon}= e^{i\varepsilon(1\pm\Delta\varepsilon/\varepsilon)}$. For the real part $\cos=1=x^2/2=1-(\varepsilon(1\pm\Delta\varepsilon/\varepsilon))^2/2$. We take one term at a time in $\varepsilon(1+\Delta\varepsilon/\varepsilon)^2= \varepsilon(1-2\Delta\varepsilon/\varepsilon-(\Delta\varepsilon/\varepsilon)^2)=\varepsilon-\Delta\varepsilon-\Delta\varepsilon^2/\varepsilon+\Delta\varepsilon^3/\varepsilon^2$. We see below that $\Delta\varepsilon$ is the 100km/sec, $(\Delta\varepsilon)^2/\varepsilon$ the 1km/sec (or integer multiples) respectively with the mixed states (eg., $(\Delta\varepsilon)^2/\varepsilon$ not realized as pure eigenstates, ie., as fundamental particles.$\langle N'|N\rangle\neq 0$ if energy eigenstate N'=N value due to energy exchange, hence we need a grand canonical ensemble for1km/sec, 20m/sec. A grand canonical ensemble allows energy exchange between systems (nonzero chemical potential) which is the classical analog of an entangled state.
From particle mass considerations (chapter 2) $\varepsilon=.06$, $\Delta\varepsilon=.00058$. We take the $\Delta\varepsilon$ term(first. For local background metric equation 4.11a implies $g_{oo}= e^{i\Delta\varepsilon}$. Here we show that a quantized metric in equation 1.9 implies a large constant v^2 in galaxy halos without invoking dark matter (see also section 1.4, 4th paragraph down and bottom of first paragraph of section 2.4). Here the metric coefficient g_{oo} levels off to the quantized value $e^{i\Delta\varepsilon}$ in the galaxy halo:

$$g_{oo}=1-2GM/rc^2\rightarrow \mathrm{rel}(e^{i\Delta\varepsilon})=\cos(\Delta\varepsilon)=1-(\Delta\varepsilon)^2/2+.. \Rightarrow \quad (23.2)$$

$(\Delta\varepsilon)^2/2=2GM/rc^2$. Thus for circular (centripetal acceleration) motion:
$v^2/r=GM/r^2 =c^2(\Delta\varepsilon)^2/4r \Rightarrow$
$v^2=c^2(\Delta\varepsilon)^2/4=(87\text{km/sec})^2$ after plugging in the values of $\Delta\varepsilon$ and c. So:

$$v^2 = \text{constant} \quad \text{or} \quad v=87\text{km/sec} \quad (23.2a)$$

So the metric acts to quantize v. The actual measured velocities include the effects of both the metric and of visible matter. Thus in general $\mathbf{v_{measured} = v_{metric} + v_{matter}}$. The quantity $\mathbf{v_{metric}/v_{matter}}$ is approximately 9, the usual "dark matter" to visible matter ratio.

$$\text{So } 10+87=97\approx 100\text{km/sec.} \quad (23.3)$$

Thus v is a constant in galaxy halos *when the metric is quantized*. Figure1 shows a typical velocity curve, here for NGC3351. Note also from sections 2.4 and 23.1 there is rotational energy quantization for the $\Delta\varepsilon$ rotational states that goes as: $(L(L+1)) \propto ½mv^2 \rightarrow \sqrt{L(L+1)} \propto v$. Thus differences in v are proportional to L, L being an integer (Figure 23-1). Therefore

$$\Delta v = kL \text{ so } v = 1k,\ v = 2k,\ v = 3k,\ v = 4k\ldots.\ v=N(100\text{km/sec}) \quad (23.4)$$

We could also take the singularity 1 (instead of $\Delta\varepsilon$, ε in equation 23.2 $g_{oo}= e^{i\Delta\varepsilon}\approx 1-i\Delta\varepsilon=1-2GM_c/r_c=1-\mathbf{1}$). In that case the radius r is set at a constant universe radius $r_c\approx 10^{10}$LY. So just below equation 23.2 (where we set $(\Delta\varepsilon)^2/2=2GM/rc^2$) instead we set $1=2GM/rc^2$.
so that $v^2/2r=GM/2r^2 =a_M$=average acceleration. Note in eq.23.4 v^2 is quantized (smallest is c^2 for zitterbewegung) and, since r_c is a constant, $v^2/2r_c=a_M$ is also quantized.

$$v^2/2r=a=c^2/2r_c\approx 10^{-10}\text{m/sec}^2 \equiv a_M. \quad (23.4a)$$

and so 'a_M' is also quantized since v^2 is. Note in the previous $\Delta\varepsilon$ case v^2/r was not quantized since r is not constant.
Anyway, for the $\Delta\varepsilon$ quantization note figure 2 and figure 3 halo speeds to see this quantization of equation 4.

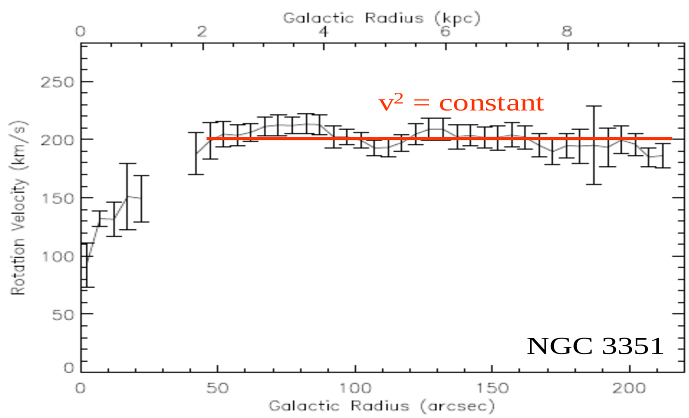


Figure 23-4. Note constant v^2 in the galaxy halo

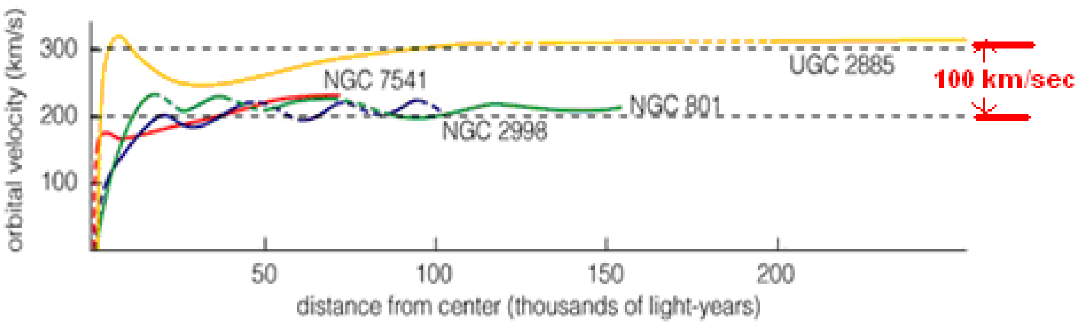


Figure 23-5. Typical Halo Velocities (2 Dicari, 2008)

23.4 Observational Evidence of Velocity Quantization

Here we present observational evidence of velocity quantization obtained from Doppler measurements of stellar motion in galaxies. Figure 23-6 is a compilation of average halo velocities for various galaxies showing an unambiguous quantization as implied by equation 4.

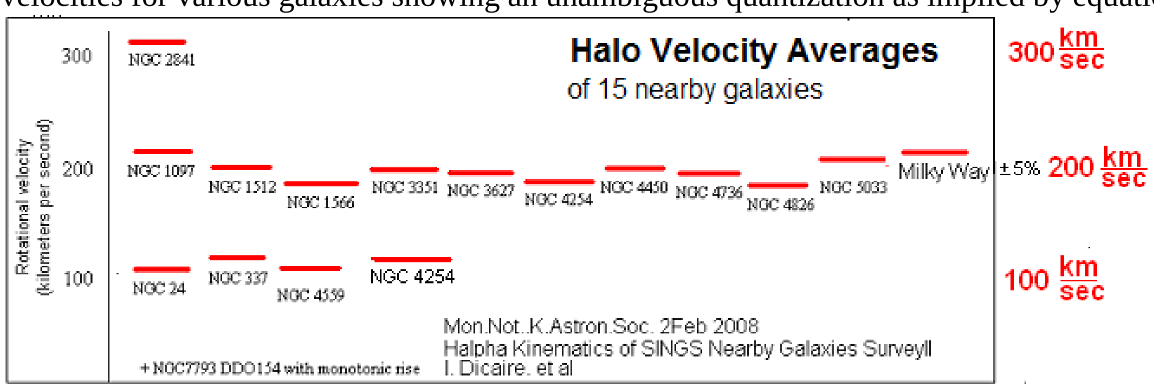


Figure 23-6. Collection of Galaxy Halo Velocities illustrating 100km/s= Δv quantization Each red line as in figure 23-4 above.

Figures 23-4, 23-5 and 23-6 show the quantization of velocities at levels of 100, 200 and 300 km/s respectively for Doppler images of various galaxies. The horizontal axis is the distance from the center of the galaxy. The vertical axis is the velocity in km/s. The velocities in all figures flatten out to the quantized values as the distance from the center increases **apparently giving exact quantization asymptotically**.

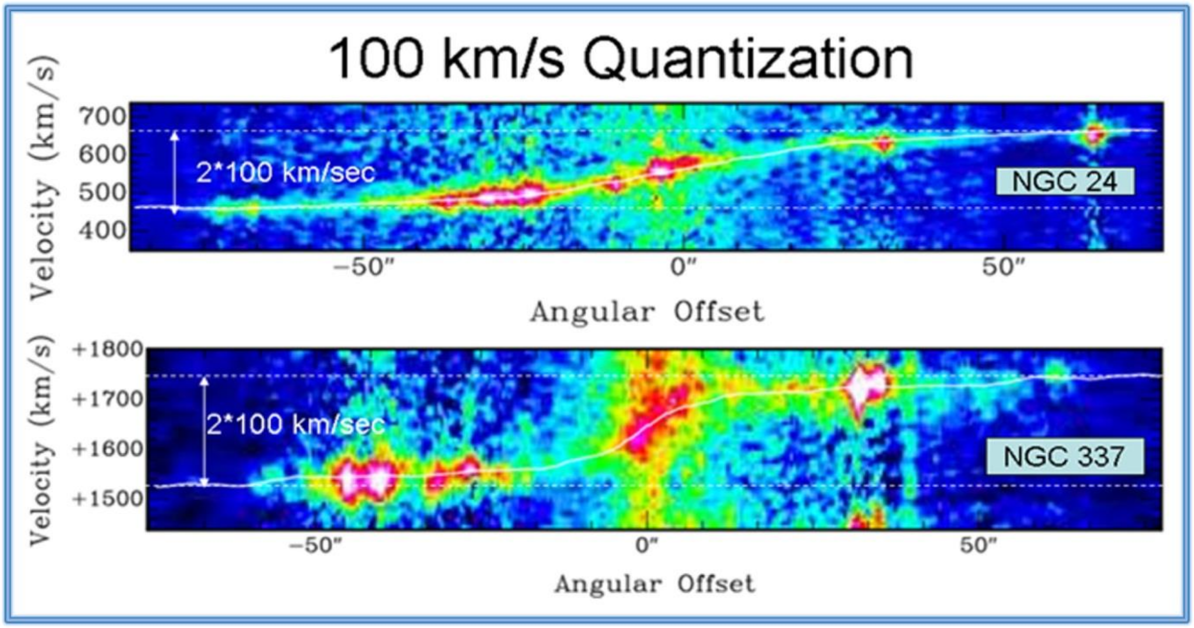


Figure 23-7. Doppler shift plots showing 100 km/s quantization

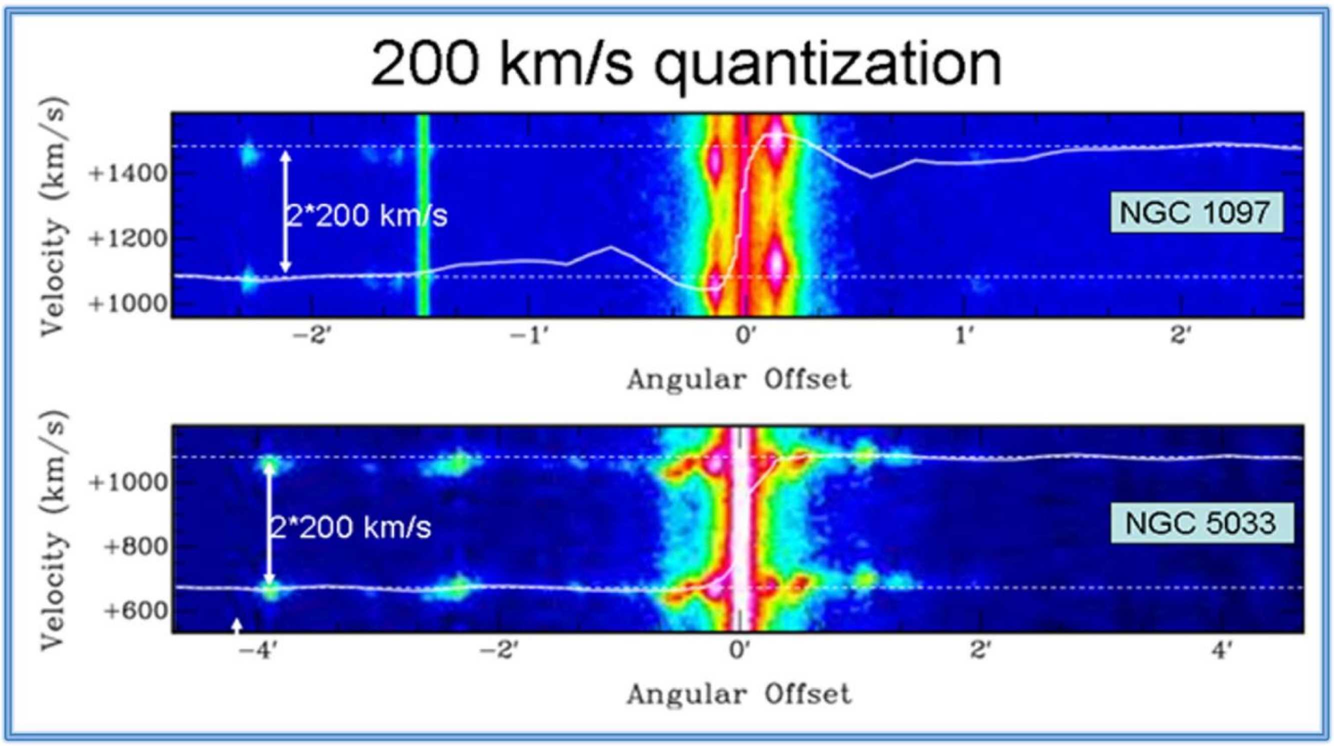


Figure 23-8. Doppler shift plots showing 200 km/s quantization

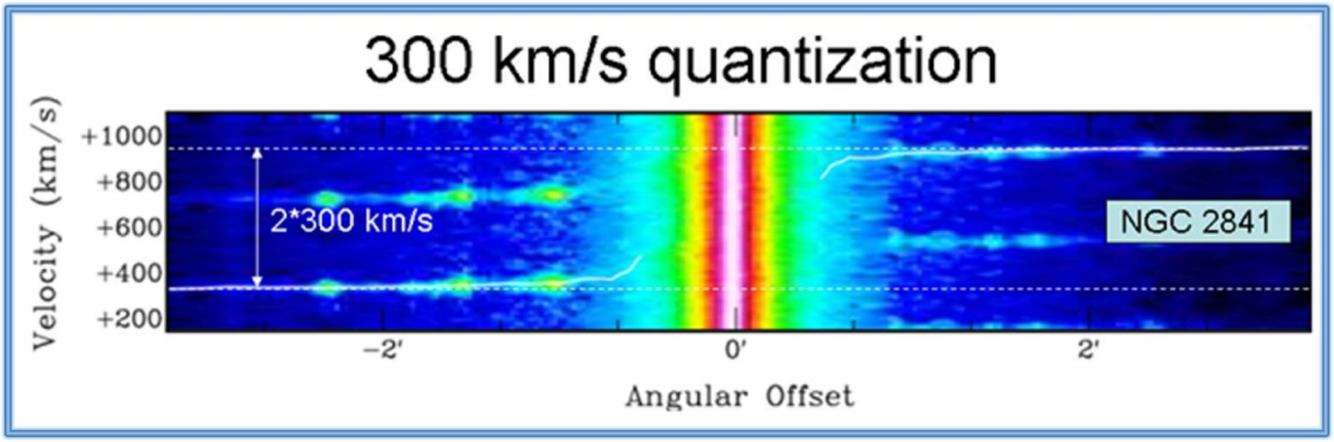


Figure 23-9. Doppler Shift plot showing 300 km/s quantization

400 km/s quantization

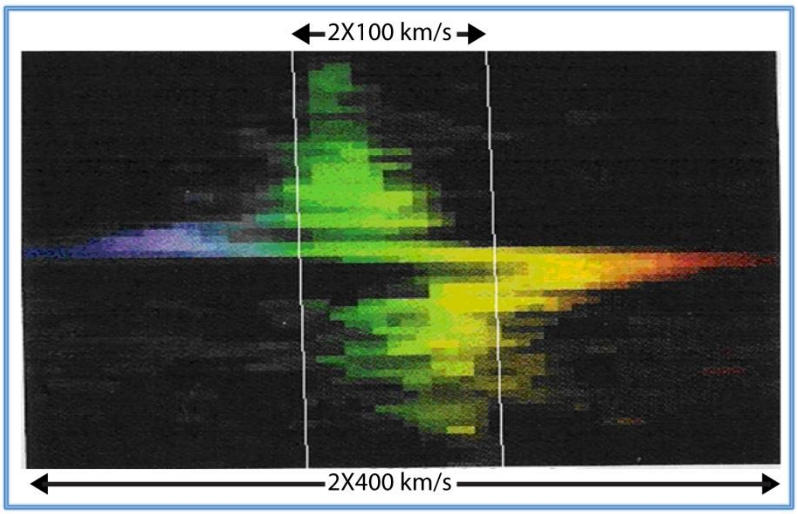


Figure 23-10 Hubble spectrum near M84 black hole accretion disk
Note extreme left and right blue and red Doppler cutoffs at **400km/s**

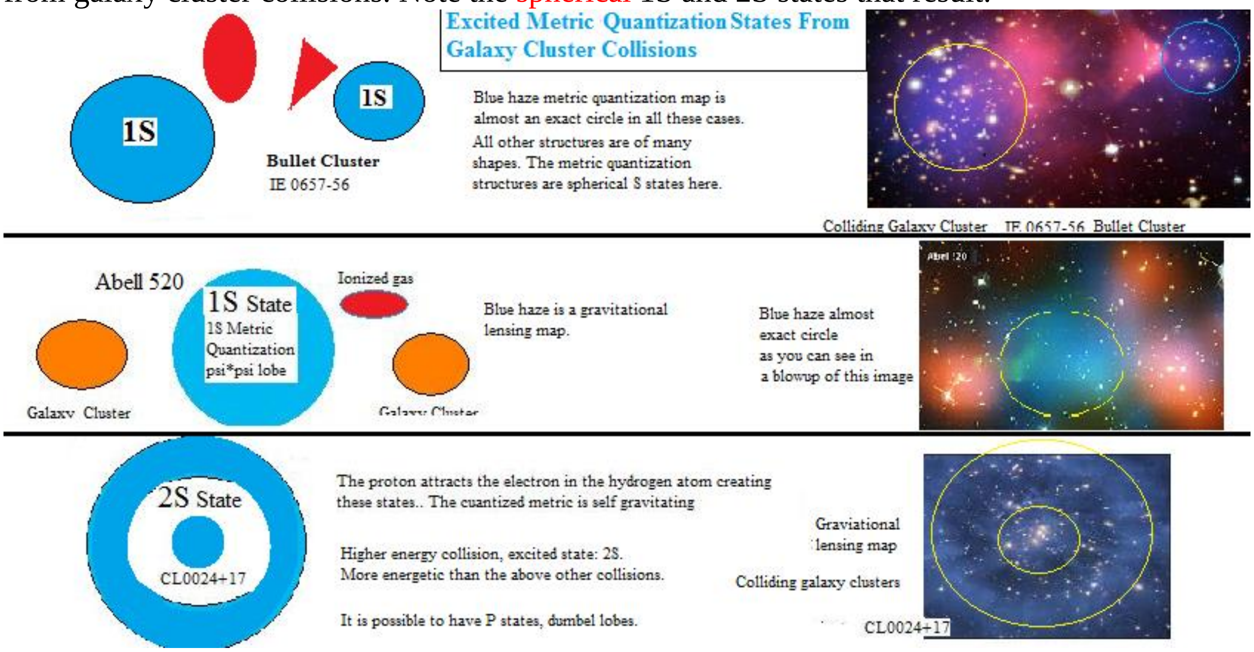
Thus these constant velocity curves can be accounted for by quantization of the metric and so there is *no need for dark matter* to do this. The point source contribution to the g_{oo} component of the metric is given by $2GM/rc^2$.

Also note our own Milky Way halo **2 level** of figure 23.6 (i.e., 2X100km/sec) background metric quantization for the $\Delta\varepsilon$ 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 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).

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.



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.

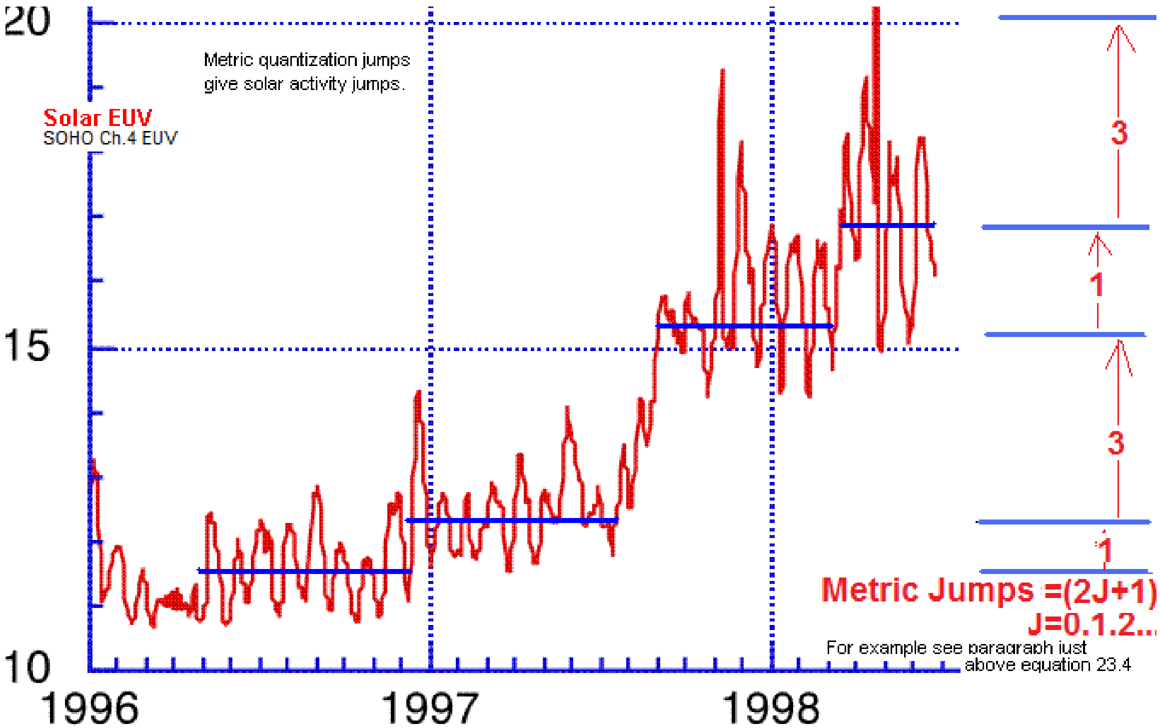
Also metric jumps out in the halo transition between galaxies would have the effect of clearing those regions of stars, especially of globular clusters. Also black hole jets would suddenly terminate at metric jump boundaries as apparently M87 s does. 1S sphere, 2S sphere-ring and sigma bond metric quantization 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 $(261\text{km/s})^2/60\text{k ly}=1.22\times10^{-10}$ 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!!!**

23.5 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 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
$\Delta g=a_{Mond}=a_M=1.7Angstrom/sec^2$.
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 equilibrium 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.



The metric quantization of the sun's gravity (seen in those EUV metric jumps) is due to a huge electron at 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.

I put in the numbers and it works. An electron at this (huge) Bohr orbit does numerically give the correct 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}

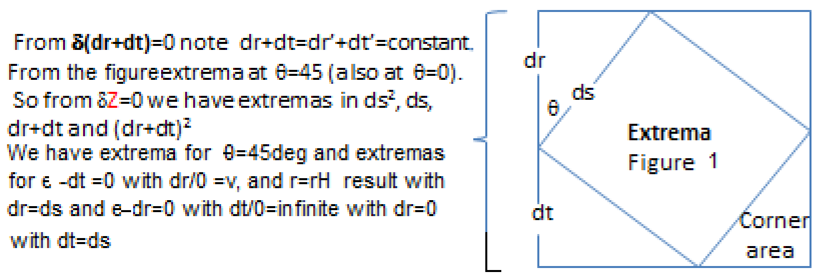
The period of oscillation of those supermassive and massive black holes in the same way (section 23.7) is in resonance with the ε(250my) and Δε (2.7my) metric jump times respectively. Recall the Δε metric contribution gives the galaxy halo quantization, the numbers work out extremely well also (section 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) :

$$E = mc^2 = \frac{im_o c^2}{\sqrt{1-\frac{v^2}{c^2}}} =\approx \frac{im_o c^2}{i\frac{v}{c}} = \frac{m_o c^3}{v} = \frac{m_o c^3}{\omega r_H}$$

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 $\Delta\varepsilon$ 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.*

23.5 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 extema. 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 $GM\approx10^{55}$(mks), $r\approx10^{25}$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 of figure 23-11) 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.

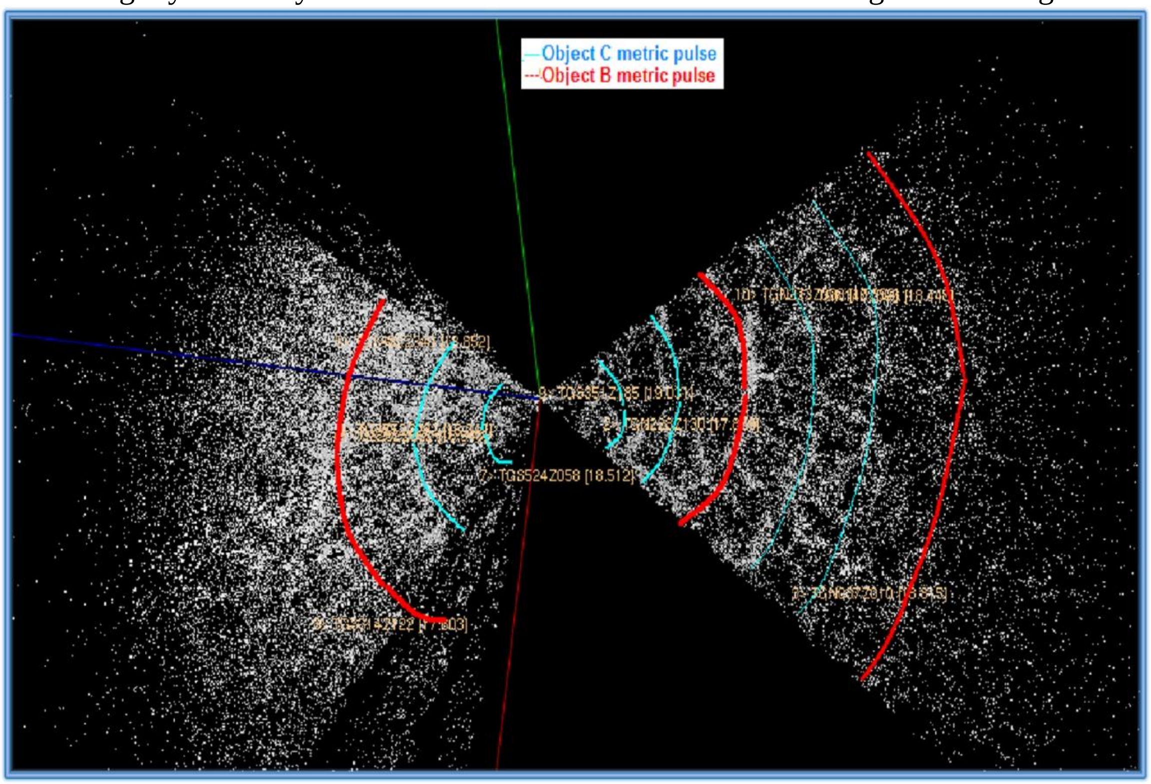
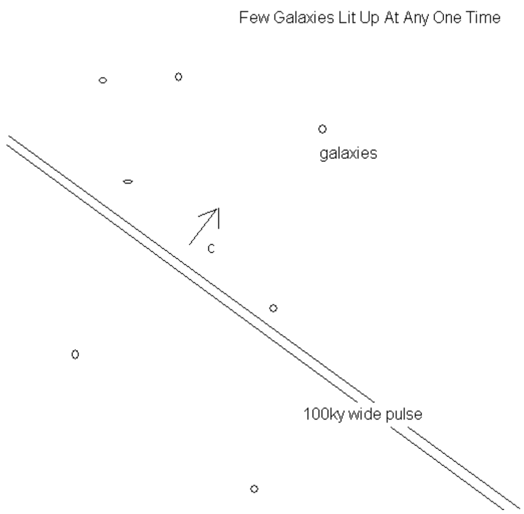


Figure 23-11 2df red shift survey, galaxy distance from earth, first red line~600mLY
2df red shift survey, galaxy distance from earth, first red line~600mLY

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 $dr/dt \approx 10^{40}c$ 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 Figure 23-1, great walls in 2df survey, etc.,(fig.23-11). 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 see ours. 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 1.9) as in equation 4.14.

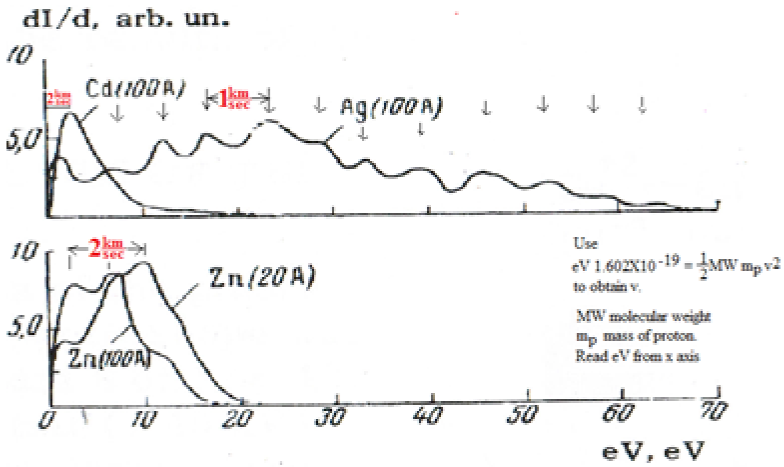


Note that outside r_H we use the standard Dirac equation operator - eigenvalue formalism. Let's say we solve the Schrodinger equation (a nonrelativistic limit of the Dirac equation that equals $\hbar/2m)d^2\psi/dx^2+V\psi=E\psi)$ for eigenfunctions ψ. We then do the eigenvalue= $\int\psi^*OP\psi dV$ =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. .

Laboratory Measurement

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=MW1.67X10^-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.



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)

You 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?).

23.6 Metric Pulses Resonate on Black Holes

"There is no middle ground when it comes to black holes, which tend instead to be either petite or gargantuan, a new study suggests."
There appear to be stellar mass black holes, middleweight black holes and supermassive black holes. Why?

Given a Kerr metric black hole. Use

$$ds^2=\rho^2\left(\frac{dr^2}{\Delta}+d\theta^2\right)+\left(r^2+a^2\right)\sin^2\theta d\phi^2-c^2dt^2+\frac{2mr}{\rho^2}\left(a\sin^2\theta d\theta-cdt\right)^2, \qquad (23.3)$$

to find the time differential dt and dθ with respect to rotating electrons in the gravitational (or magnetic) field for example, where:

$$\rho^2\left(r,\theta\right)\equiv r^2+a^2\cos^2\theta; \qquad \Delta\left(r\right)\equiv r^2-2mr+a^2,$$

with the angular momentum given by:

$$a = (v/c)r\ . \tag{23.4}$$

Here v_e is the velocity of the electron about some radius r. g_{oo} then takes the form:

$$1 - \frac{2mr}{\rho^2}$$

To solve for dt we note that equation (23.3) is quadratic in dt. This solution is found by using $Ax^2 + Bx + C = 0,$ where $x \equiv dt.$ The solution to dt is then given by:

.

$$dt = \frac{-B \pm \sqrt{B^2 - 4AC}}{2A} \tag{23.5}$$

Now given:

$$\rho \approx r; B = \frac{4mr}{\rho^2} a \sin^2\theta d\theta \approx \frac{4m}{r} a \sin^2\theta d\theta; A = \left(1 - \frac{2m}{r}\right)c^2 \tag{23.6}$$

$$C = ds^2 + dr^2 + r^2\sin^2\theta d\phi^2 + r^2 d\theta^2$$

Given that changes in r and θ are small here and that $c^2dt_o >> r^2\sin^2\theta d^2\phi$ and $c^2d^2t_o >> B^2$ note that

$$\sqrt{C} = \sqrt{ds^2 + dr^2 + r^2\sin^2\theta d\phi^2 + r^2 d\theta^2} = \sqrt{c^2dt_o^2 + 0^2 + \Delta^2}$$

At r≈2m

$$\frac{-B \pm \sqrt{B^2 - 4AC}}{2A} = B/2A$$

$$\int dt = \int \frac{-B \pm \sqrt{B^2 - 4AC}}{2A} = \int \frac{-B}{A} \quad \text{or}$$

$$dt = \frac{-B}{A} = \frac{-\dfrac{4mr}{\rho^2} a \sin^2\theta d\theta}{A\left(1 - \dfrac{2m}{r}\right)c^2}$$ the nontrivial cdt solution for distance [m] near A≈0 given as:

$$cdt = c\left(-\frac{B}{A}\right) = -c\left(\frac{2cma\sin^2\theta d\theta}{r\left(1 - \frac{2m}{r}\right)c^2}\right) = -\left(\frac{2m}{r}\right)\left(\frac{a\sin^2\theta}{\left(1 - \frac{2m}{r}\right)}\right)d\theta$$

$$c\frac{dt}{dt_o} = c\left(-\frac{B}{A}\right) = -c\left(\frac{2cma\sin^2\theta d\theta}{r\left(1 - \frac{2m}{r}\right)c^2}\right) = -\left(\frac{2m}{r}\right)\left(\frac{a\sin^2\theta}{\left(1 - \frac{2m}{r}\right)}\right)\frac{d\theta}{dt_o}$$

Next take the time derivative of both sides (assume ω and v are the easiest variables to vary: just use a toroidial sound wave to create the $\dot{\omega}$) and obtain:

$$\frac{d^2z}{dt^2} = \frac{8\left(\frac{m}{r}\right)\dot{v}\sin^2\theta\left(1+\left(\frac{2m}{r}\right)\left(\frac{v}{c}\right)^2\sin^4\theta\right) - 4\frac{m}{r}v\sin^2\theta\left(\frac{4m}{r}\right)\frac{v\dot{v}}{c^2}\sin^4\theta}{\left(1+\left(\frac{2m}{r}\right)\left(\frac{v}{c}\right)^2\sin^4\theta\right)^2} = \tag{23.7}$$

(Recall also v/r≡ω)

$$=\frac{d^2z}{dt^2}=\frac{8m\dot{\omega}\sin^2\theta\left(1+2mr\left(\frac{\omega}{c}\right)^2\sin^4\theta\right)-16m\omega\sin^2\theta\left(mr\omega\dot{\omega}\left(\frac{1}{c}\right)^2\sin^4\theta\right)}{\left(1+2mr\left(\frac{\omega}{c}\right)^2\sin^4\theta\right)^2}.$$

Since A=0 the first term in the above two numerators is 0 so the two solutions are finally:

$$\frac{d^2z}{dt^2}=\frac{-16\dot{\omega}r\left(4m\frac{\omega}{c}\sin^3\theta\right)^2}{\left(1+2mr\left(\frac{\omega}{c}\right)^2\sin^4\theta\right)^2} \qquad (23.8)\ \text{for frequency}$$

$$\frac{d^2z}{dt^2}=\frac{-16\dot{v}\left(\sin^3\theta\frac{4vm}{cr}\right)^2}{\left(1+\left(\frac{2m}{r}\right)\left(\frac{v}{c}\right)^2\sin^4\theta\right)^2} \qquad (23.9)\ \text{for velocity} \qquad (23.9)$$

Note in the above quadratic formula solution we have had to assume again that the denominator "A" is near 0 so there is a maximum z direction pulse if the denominator equals zero so that

$$1+2mr\left(\frac{\omega}{c}\right)^2\sin^4\theta=0 \qquad (23.10)$$

and $1+\left(\frac{2m}{r}\right)\left(\frac{v}{c}\right)^2\sin^4\theta=0$ (23.11)

in equation 23.9 above we note the left side acceleration with a mass multiplication a force. Plug dt/dt_o into equation 12.5 coordinate transformation and cancel the gravity and so make G=0. Note the high gravity (near singularity) and well known high angular velocity of these black holes and so large "a" contribution to the above equation.

Note also the dθ/dt *oscillation* (which is up and down at the edges so does not to effect angular momentum) at edges needed to make this term nonzero and so to cancel gravity at the poles. Thus jets coming out of black holes can occur (since no is pulling them back in then at the poles) when such oscillation at the edges occurs. As an example note the *oscillating* intensity jet coming out of M87:

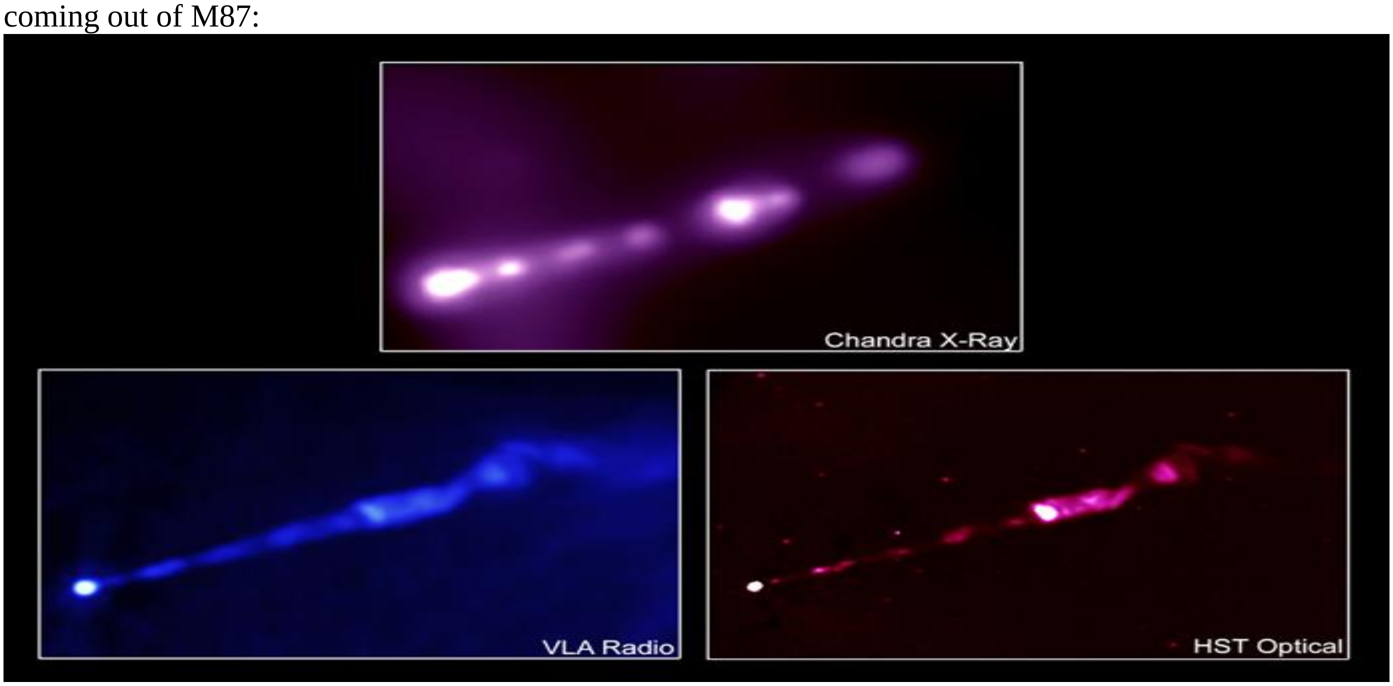


Figure 23-12

One interesting application of equation 23.7 is to substitute our κ_{ij} (from ch.1) for g_{ij} into equation 23.7 (so $2GM/c^2 \rightarrow 2e^2/m_ec^2$) and thereby duplicating this gravity cancellation artificially (STAIF 2001, Maker). Note this device must rotate and oscillate and be at 511kV to similarly take advantage of the singularity (thus it is a rapidly rotating wobbling disk at high voltage). Meteorological vortices such as hurricanes and tornados contain high voltage (e.g., thunderheads and lightning) and rotation so exhibit the 511kV rotator oscillator effect. It is well known that high lightning rates are associated with tornados (and their associated 20m/sec metric quantization mesocyclones), can even be used to locate them from satellite observations of the RF the lightning puts out. Solar X ray flares induce voltage changes in the upper atmosphere by ionization. For example there have been many occasions when two tropical storms formed simultaneously right after a large solar flare. In fact hurricanes routinely occur righr after major solar flares. In fact you can use solar flare predictions (section 24.8) to predict hurricanes. Also 15 tornados formed all at once (within a ½ hour period) in the great April 27, 2011 tornado outbreak in Alabama right after a moderate sized solar flare. So this 511kV rotator oscillator

effect

Solar Fountain: Electric Currents In the F Layer On The Day Side

X rays coming from a solar flare give Sudden Ionospheric Disturbances (SID), the equatorial electro-jet and that equatorial anomaly. Within approximately 20deg of the magnetic equator is a trough of concentrated ionization in the F2 layer. Heated (ionized) air rises creating a EXH Poynting vector sheet of electrical current forcing ionization up into the F layer.

Note that this vortex has a center and around that center we have angular velocity ω for these currents (see attachment) just as in that 511kv rotator oscillator impulse equation. The separation of water drops into large and small ones also contributes to this charge separation (at lower altitudes) and potential V in that equation. In this way the X rays from a solar flare can enhance this SID current vortex and create a hurricane using the 511kV rotator effect.

Note that this vortex has a center and around that center we have angular velocity ω for these currents just as in the above equation. The separation of water drops into large and small also contributes to this charge separation and potential V in that equation. In this way the X rays from a solar flare can enhance this current vortex and create a hurricane. The cause and effect connection can routinely be observed in weather phenomenon and even used to predict the weather.

Equatorial Vertical Air Motion

Apparently this ionosphere electric current vortex also causes a equatorial vertical movement of the air at the bottom of the stratosphere near the equator augmenting the coriolis effect and therefore moving the jet stream up and down in latitude thus becoming a major cause of the weather changes due to changes in solar EUV.

Now try the z axis to obtain the pulse:

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

$$C=ds^2+dr^2+r^2\sin^2\theta d\phi^2+c^2dt^2,$$

$$\rho\approx r; B=\frac{4mr}{\rho^2}ac\sin^2\theta dt\approx\frac{4m}{r}a\sin^2\theta dt; A=\left(\rho^2-\frac{2mr}{\rho^2}a^2\sin^4\theta\right)$$

$d\theta=\dfrac{-B\pm\sqrt{B^2-4AC}}{2A}=B/A.$ $a=(v/c)r$

At $\rho^2=(r^2+a^2\cos^2\theta)$ or for $\theta=90°$, $\rho=r$. We solve for $A\approx0$ so the numerator term $4AC\approx0$ and the denominator $A\approx0$ implications are discussed below.

At $\theta\approx90°$, $rd\theta\approx dz$ so divide by dt to get the pulse velocity.

$$dz=\frac{4mra\,csin^2\theta dt}{\left(\rho^2-\frac{2mr}{\rho^2}a^2sin^4\theta\right)\rho^2}$$ or

$$\frac{dz}{dt}=\frac{4mac\rho^2}{\frac{\rho^4}{rsin^2\theta}-2ma^2sin^2\theta}\quad\frac{dz}{dt}=\frac{4mac\rho^2}{\frac{\rho^4}{rsin^2\theta}-2ma^2sin^2\theta}$$

$$\frac{dz}{dt}=\frac{4macr^2}{r^3-2ma^2}$$

.

$$\frac{dz}{dt}=\frac{4m((v/c)r)cr^2}{r^4-2m((v/c)r)^2}=\frac{4mvr}{r^2-2m(v/c)^2}\qquad(23.8)$$

with a Next take the time derivative of both sides (assume ω and v are the easiest variables to vary: just use a toroidial sound wave to create the $\dot{\omega}$) and obtain:

$$\frac{d^2z}{dt^2}=\frac{8\left(\frac{m}{r}\right)\dot{v}sin^2\theta\left(1+\left(\frac{2m}{r}\right)\left(\frac{v}{c}\right)^2sin^4\theta\right)-4\frac{m}{r}vsin^2\theta\left(\frac{4m}{r}\right)\frac{v\dot{v}}{c^2}sin^4\theta}{\left(1+\left(\frac{2m}{r}\right)\left(\frac{v}{c}\right)^2sin^4\theta\right)^2}=\qquad(3)$$

(Recall also v/r≡ω)

$$=\frac{d^2z}{dt^2}=\frac{8m\dot{\omega}sin^2\theta\left(1+2mr\left(\frac{\omega}{c}\right)^2sin^4\theta\right)-16m\omega sin^2\theta\left(mr\omega\dot{\omega}\left(\frac{1}{c}\right)^2sin^4\theta\right)}{\left(1+2mr\left(\frac{\omega}{c}\right)^2sin^4\theta\right)^2}.$$

Since A=0 the first term in the above two numerators is 0 so the two solutions are finally:

$$\frac{d^2z}{dt^2}=\frac{-16\dot{\omega}r\left(4m\frac{\omega}{c}sin^3\theta\right)^2}{\left(1+2mr\left(\frac{\omega}{c}\right)^2sin^4\theta\right)^2}\qquad(2)\ \text{for frequency}$$

$$\frac{d^2z}{dt^2}=\frac{-16\dot{v}\left(sin^3\theta\frac{4vm}{cr}\right)^2}{\left(1+\left(\frac{2m}{r}\right)\left(\frac{v}{c}\right)^2sin^4\theta\right)^2}\qquad(3)\ \text{for velocity}$$

Note in the above quadratic formula solution we have had to assume again that the denominator "A" is near 0 so there is a maximum z direction pulse if the denominator equals zero so that

$$1+2mr\left(\frac{\omega}{c}\right)^2sin^4\theta=0\qquad(4)$$

and $1+\left(\frac{2m}{r}\right)\left(\frac{v}{c}\right)^2sin^4\theta=0$ (5)

w that oscillates. with $r^2\approx2m(v.c)^2$ and $\theta\approx90°$

Note for a rotating black hole with strong z axis field (or rotating moist air cylinder with charge instead of the mass) we can draw a cylindrical Gaussian pillbox around the (2nd time derivative from 511 Kerr metric derivation) cylinder and thereby derive using Gauss's law a 1/r force (instead of $1/r^2$). Thus instead of $GMm/r^2=mv^2/r$ we have $kGMm/r=mv^2/r$ and so the r cancels out and we are left with a rotational speed that is constant (independent of r) as in galaxy halos (eg.,200km/sec) or in mesocyclones (20m/sec) or in the sun (1km/sec). Thus because of the cylindrical symmetry the old inverse square law E&M and gravity (in the form of Gauss's law) still holds!

$2m=2GM/c^2 = r_H$ was derived in equation 12.5. The $r_H=2e^2/m_ec^2$ is from chapter 1.

The condition assumed above that allowed us to solve for dz/dt was θ=90° and A≈0 so that for the equation 12.5 classical GR result

$r = (v/c)\sqrt{2\frac{2GM}{c^2}}$. or

$\left(\frac{r}{v}\right)^2 \frac{c^4}{4G} = M$

For a black hole with equatorial event horizon rotating at speed c, r=10000m $M=3.3X10^{34}$ kg ≈150000 solar masses. For the chapter 1 r_H we have:

$\left(\frac{r}{v}\right)^2 \frac{2m_e c^4}{2e} = q$=2billion C for v=100m/sec, r=2m using the r_H from chapter 1.

Rotating at (1/100)c gives 2coulombs.

There is a maximum z direction pulse if the denominator equals zero.(eq.23.8). Thus inside the horizon region there is an effective dz/dt pulse. Further out, at r=2m (if large oscillation dθ/dt) gravity is zeroed (eq.23.7) In section 24.8 we show how diffusion charge separation occurs giving rise to separated charge motion and so to strong magnetic fields. Outside this larger radius there is not such a pulse unless a $\vec{F} = q\left(\vec{v}X\vec{B}\right)$ magnetic force makes 'm' effectively large r in eq.23.8 thus allowing ρ to be effectively much larger thus still maintaining an effective 'singularity'and pulse out at larger r. Thus we have the possibility of beaming along the z axis (large r along the z axis) with the magnetic force playing the role of extending the singularity to large r along the z axis.

Note if $2m \rightarrow e^2/m_ec^2$ =1/512kV,from our part 1 application to the new pde implies a new propulsion method (note dz/dt impulse) using oscillating, rotating 512kV.

Metric Quantization And 511kV Rotator Oscillator

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

(1)

with a Next take the time derivative of both sides (assume ω and v are the easiest variables to vary: just use a toroidial sound wave to create the $\dot{\omega}$) and obtain:

$$\frac{d^2z}{dt^2} = \frac{8\left(\frac{m}{r}\right)\dot{v}\sin^2\theta\left(1+\left(\frac{2m}{r}\right)\left(\frac{v}{c}\right)^2\sin^4\theta\right) - 4\frac{m}{r}v\sin^2\theta\left(\frac{4m}{r}\right)\frac{v\dot{v}}{c^2}\sin^4\theta}{\left(1+\left(\frac{2m}{r}\right)\left(\frac{v}{c}\right)^2\sin^4\theta\right)^2} = \qquad (3)$$

(Recall also v/r≡ω)

$$= \frac{d^2z}{dt^2} = \frac{8m\dot{\omega}\sin^2\theta\left(1+2mr\left(\frac{\omega}{c}\right)^2\sin^4\theta\right)-16m\omega\sin^2\theta\left(mr\omega\dot{\omega}\left(\frac{1}{c}\right)^2\sin^4\theta\right)}{\left(1+2mr\left(\frac{\omega}{c}\right)^2\sin^4\theta\right)^2}.$$

Since A=0 the first term in the above two numerators is 0 so the two solutions are finally:

$$\frac{d^2z}{dt^2} = \frac{-16\dot{\omega}r\left(4m\frac{\omega}{c}\sin^3\theta\right)^2}{\left(1+2mr\left(\frac{\omega}{c}\right)^2\sin^4\theta\right)^2} \qquad (2) \text{ for frequency}$$

$$\frac{d^2z}{dt^2} = \frac{-16\dot{v}\left(\sin^3\theta\frac{4vm}{cr}\right)^2}{\left(1+\left(\frac{2m}{r}\right)\left(\frac{v}{c}\right)^2\sin^4\theta\right)^2} \qquad (3) \text{ for velocity}$$

Note in the above quadratic formula solution we have had to assume again that the denominator "A" is near 0 so there is a maximum z direction pulse if the denominator equals zero so that

$$1 + 2mr\left(\frac{\omega}{c}\right)^2 \sin^4\theta = 0 \qquad (4)$$

and $1 + \left(\frac{2m}{r}\right)\left(\frac{v}{c}\right)^2 \sin^4\theta = 0$ (5)

ω that oscillates.

with substitution $m=e^2/m_ec^2$ which gives the precision QED results for that new pde without the higher order diagrams and for which an equivalence principle can be stated (so in contrast this really *is* physics).

I solved equation 1 for dθ as if it was a quadratic equation and then for dz/dt by taking the limit as theta approaches 0. Then you can take the time derivative of this dz/dt to obtain the "force" in the z direction d^2z/dt^2 in a chain rule as a function of quantities that can be artificially set (like charge, rotation speed, radius, etc.).

For some wobble settings you can then aim the z axis at a mass with large solid angle so that there can be action reaction pairs, thus satisfying the conservation of momentum and so giving propulsion. There are some reality checks on this idea such as replacing m=e^2/mec^2 with that old $GM/c^2$and then seeing what happens: you do get axial forces alright from such objects (those ubiquitous z axis jets). In the case of that NASA experiment there could be a rotating TM mode with longitudinal E field moving electrons circumferentially in the conducting wall creating this same effect.

The 511kV rotator oscillator has a **v** (speed) output: recall that dz/dt resulting from those quadratic equation solutions to that Kerr metric containing *the* $r_H=2e^2/m_ec^2$.

The metric quantization also *has a* ***v*** *(speed) output:* recall those quantized galaxy halo speeds.

Metric quantization is the result of ***angular momentum quantization*** associated with object B. The 511kV rotator oscillator Kerr metric with a=Nhbar/mec gives semiclassical ***angular momentum quantization.***

A possibly random oscillation dtheta/dt **(like a temperature effect**) is needed for the 511kV rotator oscillator to work.

A partition function **(like a temperature effect**) accompanies the metric quantization.

.The 511kV rotator oscillator however allows you to determine the effects of metric quantization at specific angles and distances. Note also that the 511kV rotator oscillator is another way of determining gravity which is consistent since metric quantization is *also* a change in gravity.

23.7Metric Oscillation

Recall equation 20.6 (and section 2.1) where here it is applied to

$$ln(r_{final}/r_{initial})+2=[(1/U)-lnU]$$

In the exterior black hole regime (U≈i), we take exponential of both sides and get $r\propto e^{i\omega t}$. with a dipole possible as we saw in 20.5. With a dipole there can then be gravity wave radiation into or out of the oscillating object according Birkhoff's theorem. From the 4 laws of black hole dynamics the temperature T is proportional to the surface gravity. We can then model this object as a spring system with the Hooke's law spring constant k vibration of the Schwarschild radius $2GM/c^2=r_o,=x$, $2E/x^2=k= 2Mc^2/(2GM/c^2)^2 =k=1/M$. Thus in this application of Hooke's law $k\propto 1/M$ and so $\omega=\sqrt{\frac{k}{m}}=\sqrt{\frac{c_1}{M^2}}$ ..=$\frac{c}{M}$. So the ratio of the supermassive to massive frequencies is $\frac{M_2}{M_1}=\frac{\omega_1}{\omega_2}$ = $\frac{3billion-solar\ masses}{30million-solar-masses}$ =100 and also proportional to mass and the external metric contribution to gravity.

The metric oscillates as we found. Also for a spherically symmetric metric: . $\frac{2GM}{c^2}=r$ or for nucleon density: $\frac{2G\rho\frac{4\pi}{3}r^3}{c^2}=r=\frac{2G\left(\frac{1.67X10^{-27}}{(.5X10^{-15})^3}\right)\frac{4\pi r^3}{3}}{c^2}$ Solve for r. Get r=20km. for a stellar black hole. But larger black holes have the lower density here of compacted hydrogen atoms as in a dwarf star. In fact the density for the larger universe is a near vacuum. So here we estimate the spring constant using proton mass 'spring energy' contained in this compacted hydrogen atom (with 90eV maximum ionization energy) black hole from $E= ½kx^2$ equals

$\frac{energy_{proton}}{(dx)^2}=2\frac{90X10^{-19}}{(10^{-10})^2}=10^4=k$, Use $M=30X10^6$ suns $\approx 10^{30}$kg for the massive black hole

$\sqrt{\frac{k}{M}}=\omega$ $=10^{13}$sec=1/3million years, the Δε oscillation. Note the frequency is then smaller for the supermassive black holes by the above M_2/M_1 coefficient.

Thus the natural frequency of the massive black holes corresponds to the Δε metric change frequency. There can be a resonance then between the metric oscillation and the black hole oscillation.

Single Vertex Diagram

Recall the single vertex Feynman diagram has a gamma ray and positron and electron vertex, these three world lines intersect at one point?.

Note the vibration of the gamma ray on the electron at the vertex has to be at some frequency f in 511eV= m_ec^2=hf to cause the creation of the positron for low velocity scattering. Recall the electron has spin.

Well, in the 511kV rotator oscillator effect there must also be a phasing of the dθ/dt and the V change (analogous to the gamma ray oscillation at the vertex) or the overall negative g effect is

not seen, the impulse integrates out to zero.(if zero energy exchanged analogous to the above low velocity scattering). Note the impulse does not occur with without rotation, spin either.
The **511kV rotator oscillator effect is** really **the single vertex** (diagram) seen from the **inside**, It a fractal effect.

23.8 Resonance of Metric Change Oscillation And Black Hole Oscillation

Recall our $e^{iHt/h} = g_{oo}$ solution from the Heisenberg equations of motion. The above resonance frequencies correspond to the ε and Δε metric oscillation periods (1/frequencies) of 600my and 3my of 3billion and 30 million solar mass black holes respectively. Large or smaller black holes either increase or decrease in size to these two values. Thus black hole sizes are quantized to the ε and Δε respective frequencies. Since the large black holes set the sizes of the galactic clusters (M87 for Virgo) then ordinary galaxy sizes are set by the smaller ones. Thus the size of the dominant structures in the universe is set by that ε and Δε metric oscillation.
Also when one of those metric changes hits a galaxy nucleus the black hole mass change causes it to then create a pulse since its mass changes as well (in fact I have a picture of Central region of the Perseus galaxy cluster gives a 57th harmonic picture with period 3my). This causes a pressure wave (i.e., sound wave) to move radially away from the black hole acting much like a square wave for the delta epsilon metric change for example. In our galaxy these Gibbs effect metric jumps are all due to our galaxy nucleus responding to quantized metric changes and then transmitting those metric changes out to the rest of the galaxy. The metric also jumps down for Δε (as well as with ε above) so that much less severe geological time chart boundary events also occur on average on the $290[\varepsilon/(\Delta\varepsilon)]=290/(103)=2.8$mY time scales. Such metric change regions (especially on the 2.8My period) should be observable in a relatively ‘stable’ (collision free) galaxy as uncharacteristically symmetric concentric active star forming regions such as those Hα bands around the Andromeda galaxy. These changes are actually visible in these narrow Hα rings. Also the galaxy ‘great’ walls (~600mly diameter) are characteristic of the ε metric jumps.

23.9 Casimir Effect Implications Of The Black Hole Horizon

Recall from section 16.4 the H_M (electron) and H_{M+1} (cosmological) Hamiltonian vacuum contributions of equation 1.9. Recall that the H_{M+1} neutrinos went right through the conducting plates and certain E&M (electron) contribution harmonics were deleted due to those boundary conditions giving rise to the Casimir force pushing the two plates together, But in a black hole both the H_M AND the H_{M+1} are *stopped* at the horizon thereby contributing a huge Casimir force (and thereby energy through the Fdx work done H_Ms) since as we saw above, there can be frequencies excluded inside the black hole just as they are between Casimir‘s plates. This then gives the black hole complete ‘control’ of the surrounding metric quantization, this black hole Casimir energy provides the metric quantization energy in this region. As a result equation 4.2 is written with the metric change Δε, ε metric oscillation taking the place of the harmonic gauge. Given the spinning field dipole symmetry the resulting wave equation (with c as the velocity, Δε, $\varepsilon \propto \omega$ providing the wave equation frequency boundary conditions) is written in oblate spheroidal coordinates. The Laplacian solutions are oblate spheroidal harmonics that are mixtures of Legendre functions. Thus at least in the near spherical case oblate S state and oblate P state metric solutions exist which these ‘dark matter’ maps are actually Δε metric jump mapping around galaxies (here there is no dark matter, just this metric quantization). Thus the black hole (and its metric resonance of section 23.9), even though it is only about 1/1000 the mass of a typical galaxy it is imbedded in, determines the extent of metric quantization (section 23.4

above) around it, not that far more massive stellar component with its billions of stars. We can also describe this metric resonance in terms of the metric states ψ in:

$H_o\psi=E_n\psi_n$

We introduce a strong local metric perturbation H' due to a black hole at the center of a galaxy lets say so that:

$H'+H=H_{total}$ where H' is due to the black hole. Because of this metric perturbation $\psi=\Sigma a_i\psi_{Ii}$=orthonormal eigenfunctions of H_o. $|a_i|^2$ is the probability of being in the state i. These a_i s would be zero for ordinary star perturbations. Thus the black hole creates the nonzero higher metric quantization states with

$a_k=(1/(\hbar i)\int H'_{lk}\, e^{i\omega lkt}\, dt$

$\omega_{lk} =(E_k- E_l) /\hbar$

Thus in this way a massive black hole creates the metric quantization states around a galaxy: without it the quantization would only be in the lowest energy state. Without the higher level metric quantization galaxies would not hold together so black holes dominate the galaxy's gravity even though they are comparatively far less massive than the galaxy as a whole.

CHAPTER 24

Metric Change Effects on the Sun's Gravity, Earth's Interior Isotopic Decay Rates and on Earth's Geological Time Table

24.1 Introduction: Metric Changes and Inertia Effects

Metric changes change inertia and therefore mass. In that regard recall the 1+ε/2+Δε/2 masses in the g_{oo} metric component for example.

1) The rate of energy output or power produced in the sun goes as T^{17}. But the sun's mass determines directly the temperature T that can be sustained and therefore power output. Thus the power output from the sun is very sensitive to mass changes. Thus these metric changes effect the power output from the sun. The solar contant determines the climate on the earth.
2) The rate of radioactive decay has a exponential dependence on the potential barrier that must be tunneled through. But this potential height has a dependence on the nuclei mass. The nuclei mass is also dependent on the metric change so the rate of radioactive decay is strongly dependent on metric change. This rate of radioactive decay determines interior heating within the earth and therefore the rate of volcanism and tectonic activity inside the earth.

   The detailed calculations for both radioactive decay dependence on potential barrier height and solar output dependence on T^{17} are given elsewhere.

   "*Evidence for Correlation Between Nuclear Decay Rates and Earth Sun Distance*" Jere Jenkins atXiv.(0808.3283v1 [astro-ph] 25 Aug 2008

Prediction of solar flares 39 hours ahead by change in rate of decay of Chlorine 36 Half life of 301,000 years. Beta emitter, Jenkins, University of Kentucky School of Engineering Aug.2012, Fischback at Purdue University.
Since 2006 has seen annual pattern radioactive decay rate change..
Note that the metric change causes the flare and causes the rate of radioactive decay to change.

24.2 As the Metric Expands the Metric Quantization Jump Boundaries Must Move

$\sqrt{1+\varepsilon+\Delta\varepsilon}$ **≈1+ε/2+Δε/2**

As the metric expands the metric quantization jump boundaries must move. Thus there must be a periodic rapid decrease in the ambient metric coefficients. In that regard recall just the quantization of the Δε red shift in units of observed 71km/sec. That Δε and ε lead to a 71km/sec and (ε/Δε)75km/sec =v_q =73450km/s quantization of the red shift(calculation above). c/v_q=13billion/x leads to x=3.1million (for the Δε substitution) and for the ε/2 substitution we get 310million year interval in time between major metric changes(actual 290mY) along with the above object C 1/3 split.

24.3 Metric Change and Inertia

Recall the Gamow factor $1/\theta^2 = \exp(-2\pi Z_1 Z_2 e^2/(\hbar v))$ in the Coulomb barrier transmission coefficient. $T=4/(4\theta 2+(1/(4\theta^2+(1/4\theta^2)^2\cos^2 L+4\sin^2 L)$ reaching maximum value (cosL=0) at L=(2n+1)π/2, J=(n+½)h with the J condition the same as for bound states. Changes in mass imply changes in electron speed v inside the nucleon (since this ultrarelativistic v is the source of the mass of the nucleon. See ch.2) and nucleus and so imply changes in transmission coefficients T. Thus changes in mass effect nuclear decay rates in the earth (changing rates of volcanism) and the mass of the sun and therefore the rate of energy release from the sun. Orbits of satellites and other objects don't appear to change in these metric change events since both mass and r change (in $v^2=GM/r$) proportionally since $dr'^2= dr^2/(1-r_H/r)$; $r_H=2e^2/m_ec^2$ so effectively r is getting bigger since m_e is getting larger. Also spectra don't change since the fine structure constant does not change (except cosmologically). Thus the chemistry doesn't change either. Note in section 23.8 (the Casimir effect implication) that changes in the gravity for massive objects cause metric changes in the surrounding region. This gave us the metric quantization of section 23.5 but on a far smaller scale it also can change the rate of alpha particle decay. Thus 24.8 planetary gravity effect also should change Geiger counter click rates and also rates of radioactive decay in the earth and therefore effect volcanism rates.

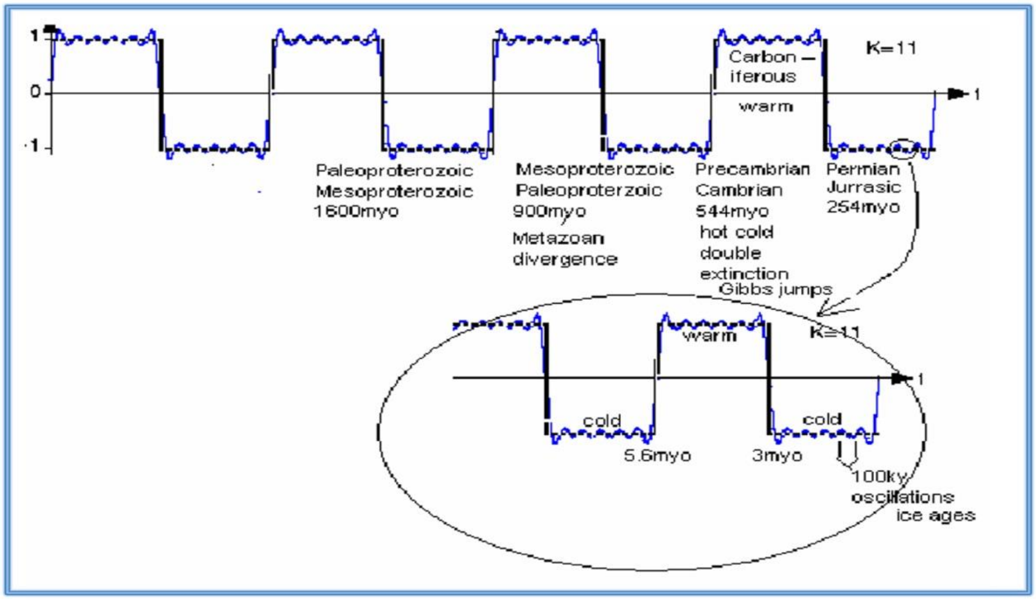
The epsilon changes in delta epsilon increments and stellar spectra don't change except in each spectral line being shifted from the standpoint of a distant astronomical observer. The reason for these energy levels is thus analogous to the Raman spectrum in the CO molecule.

Recall the Gibbs overshoot phenomena in equation2 23.1 and 23.2. So for example the rate of thermonuclear reactions in the sun and radioactive decay in the earth change, etc. must change radically at these times (especially at the Gibbs overshoot times, cooling AND heating Gibbs jump is 100,000 years in duration. The 2n+1 sequence goes as 1,3,5,7,.. (for n=0,1,2,..). Thus the first and most important jump is from 1T to 3T and so we have these two cycles on top of each other with the other frequencies are attenuated much more**..** Passage of this phenomena through the 100kly diameter galaxies should attenuate the higher frequencies. It might be possible to see consequences of these 3 harmonic apart individual cycles. Thus due to this frequency cutoff (the small scale $\Delta\varepsilon$ structures) in the Fourier expansion of E making it not exactly a square wave, it was not heterodyned to the highest frequencies). This should produce this 100ky Gibbs jump major climate and volcanic Gibbs phenomena heating and cooling double catastrophe changes on the earth (and other planets) at those time intervals (especially the larger (ε itself which gives a ~290My ~13gYXε using above g_{rr} analysis). This would occur at 544my. See Figure 24-1.

The shorter 2.8my cycle appears as a *square wave* of this form:

```
       ^ 0my                3my ___warm_____5.6my          9my____warm____
 temp|    ____cold______|                        |____cold_____|
```

24.4 Geological Time Table Summary



$$1/\sqrt{g_{oo}} \propto \int^{t} \left(\left| \sum \frac{\sin((2n+1)\omega_{\varepsilon} t)}{2n+1} \right| \left| \sum \frac{\sin((2n+1)\omega_{\Delta\varepsilon} t)}{2n+1} \right| \right) c dt \qquad (21.1)$$

Figure 24-1 Equation 21.1 Gives the History of the Earth

Geological Time Table Equation **(i.e., history of the earth equation)** from 23.1

Here again we have with $2\pi/\omega_{\varepsilon}$=290my, $2\pi/\omega_{\Delta\varepsilon}$ =3my stair step jumps in giving the red shifts. Also in our equation we have a 100ky Gibbs overshoot. We give evidence for each of these jumps.

Note: Large meteoric impact effects (e.g., 63my) are not included here.

24.5 100ky Gibbs OverShoot

Metric change pulses of period shorter than 100,000 LY are scattered by galaxies which are on average of that size (in analogy to Mie scattering). This attenuates higher frequency contributions to the spin flip square wave (eq. 22.1) and thus gives the square wave a 100,000 year Gibb's overshoot and oscillation on the top of the square wave. Note this same scattering effect will result in higher frequency scattering resulting in higher frequency gravity waves scattering into a noisy background. This should result in these gravitational wave detectors detecting only a noisy background (unless they are turned on for more than 100,000 years).

It is also well known that the earth's orbital Milankovitch cycles are not sufficient magnitude to explain this strong 100,000 year periodicity of the ice ages. There are other stronger Milankovitch cycles *ignored* simply because they don't fit to that periodicity of the ice ages (see: wikipedia/ Milankovitch cycles/problems).

That big ε metric change effect also effects gravity, causing the gravity of the sun and earth to change effecting the rate of radioactive decay in the earth and thermonuclear reactions in the sun. That big epsilon metric change effect occurs about every 290my and one is due in about 36my. The Gibbs phenomena associated with this effect has been geologically measured and has terms that are cutoff at about 100,000 years making the Gibbs overshoot about 100ky long.2km of ice covering the earth for 100ky and 100ky years of heating causing a near extinction of life at the Permian Jurassic boundary. But a Gibbs overshoot has smaller oscillations of about the same period associated with it .Thus these smaller 100ky gravitational oscillations are occurring right now. Thus a 100,000 year cycle in heating and cooling should be in evidence, the cycle of the ice ages! The summed wavefunctions are due to perturbations due to rotational and oscillational boundary conditions at the horizon boundary. Thus cosmologically there is a stair step in the metric change giving the quantized red shift and locally all we see is that 3my pulse with that Gibbs effect 100ky oscillation due to that 100ky up and down spike.

This forms the very convincing evidence for the 100ky Gibbs overshoot and cycle sequence

24.6 290my and 544my Increment Square Wave Jumps

There is a great deal of observational evidence for these metric jumps. (here on earth and give more volcanism on Venus and liquid water and volcanism on Mars). Venus had a volcanic event that covered the planet circa 544myo jump, the lava lobes on top of Mars volcanoes are roughly 290my apart in age and perhaps are the periods heating of water flow (and associated layers of sediment) also and at a half period 254MY ago at the Permian-Jurassic boundary which was also a Gibb’s double catastrophe. Have such changes occurred in the past? , the 544myo to 245myo square wave pump gave rise to the carboniferous, a long warm period.

Large scale double extinctions did occur at the 544 million (Precambrian-Cambrian boundary and 254 million (Permian-Jurassic boundary, also less researched events occurred at the 2X290my intervals of Mesoproterozoic-Neoproterozic (900my) and Paleooproterozic-Mesoproterozoic (1600my boundary). Recent research have found a 1.7 byo event and a 1.4 byo event. 1704myo and 1416myo are 254myo with multiples of 290my added to them. at 900myo there was the metazoan divergence, at 1400myo there was a granite intrusion (more volcanism) in death valley rocks,

Some recent quotes from the literature:

At about 1.4 billion years ago, the metamorphic complex was injected with dikes and larger blobs of granitic magma." ...in death valley rocks

“Early Metazoan Divergence Was About 830 Million Years Ago"

They arrived at a protostome-deuterostome divergence time of **830mya**..." ", then swung back to the conventional figure of **600 million years**."

On Mars there is Hint Of Heating And Water Flow 544million years Ago

“The largest of the channels engraved into Mars **within the past 500 million years** belong to the 600-mile-long (1,000 kilometer) Marte Vallis system. Probing Marte Vallis could offer hints on a time otherwise thought of as cold and dry. However, Marte Vallis lies in Elysium Planitia, an expanse of plains along the Martian equator. This area is the youngest volcanic region on Mars, and massive volcanism throughout the past **several hundred million years** has covered most of its surface with lava, burying evidence of its recent history, including..”

This forms the very convincing ε cycle sequence(Upper portion of figure 6 above): 254my ago, 544my ago, 834my ago, 1124 my ago, 1414my ago, and 1704 my ago.

Next we note that unconformities seem to match ε metric change events.for example in the Grand Canyon (GC):

Unconformity Time	Formation Name	
245MY	Kaibab formation (GC) Grey limestone,sandstone, siltstone	
(top layer)	Gypsum, chert	
	Also 256MY Toroweap formation with grey limestone, chert	
544MY	Bottom of Tonto Group (GC)	(bottom layer)
1050MY	Top of Unkar group (GC)	
Middle Proterozoic		
1260MY	Bottom of Unkar group(GC)	
1660MY	Vishnu Formation (bottom of GC)	

Note approximate multiples of 270MY metric change time intervals for these unconformities..This appears to occur elsewhere also. For example the Rain Valley and Concha formations in the Hoachuca Mountains of Ar are equivalent respectively to the Kaibab and Toroweap Grand Canyon (GC) formations. The Kaibab formation also (deeply) underlies the Quartzite Ar area.

Unconformity information obtained from Arizona Geology map.

Note that the Grand Canyon bottom of the Tonto group to Kaibab formation constitutes a 270my metric quantization time period (for ε) and **it does subdivide into about 100 units** (much smaller ones come after that),which is that Δε quantization (object C). Also the 270my time shrinks to 200my by 1by years so that the great walls and larger structures associated with ε 270my metric quantization largely disappear on larger spatial scales than about 2by light years. The vibrational mode of object B and A does create a another antinode at 6by however.

Geology Unconformity ε 270MY Metric Change Cycles

Change in the nuclear tunneling potential due to ε metric jump (mentioned above) again implies a variation in heat generation through radioactive decay in the earth's mantle and core and therefore changes in plate tectonic activity in the crust. In that regard there is strong evidence the 270 MY ε metric change cycle generates 270MY cycle of geological unconformities. In that regard for a large scale unconformity with flat land mass to form an entire flat land mass had to have risen pretty rapidly (~100kY Gibbs phenomena jump) out of the ocean (due to metric change in this case). Once it has risen it doesn't erode much because it is flat (steep mountains rapidly erode, these flat geographies do not). At the next metric change, a long time later, it may drop back down below the ocean and sediments will continue coming in from surrounding rivers, and the cycle repeats itself. So we see a flat rock layer, then a deep set of much younger rock strata over it (hence the unconformity), For example the mid North American continent rose several miles out of the sea in the late Permian ε metric change. The (formerly sea floor limestone) region was nearly flat so very little erosion occurred after it rose above sea level causing the appearance of a geological unconformity when the next subsidence metric change occurred and once again sediment started accumulating. Energy rises continuously and so jumps at $k\varepsilon\sqrt{(L(L+1))}$ intervals=1, 1.73. So those square wave jumps should occur at these time intervals.

Note approximate multiples of 270MY metric change time intervals for these unconformities..This appears to occur elsewhere also. For example the Rain Valley and Concha formations in the Hoachuca Mountains of Ar are equivalent respectively to the Kaibab and Toroweap Grand Canyon (GC) formations. The Kaibab formation also (deeply) underlies the Quartzite Ar area.
Unconformity data obtained from State of Arizona geology map.

24.7 2.8my and 5.6my Metric Increment Square Wave Jumps

We note that from just above 5.6my it was cooler, from just over 3my to 5.5my is warmer. After just over 3my it was cooler again. Here is that quote from the article
"from 10 million to 5.6 million years ago, cyclic glaciation was highly active in the Northern hemisphere and glaciation was suppressed between 5.5 million and 3.5 million years ago.".. Of course we are back to the glaciation once again after 3my, we just came out of an ice age for example so the past 3my has been a cold period.

Recall metric jumps would increase radioactive decay and therefore volcanism. In that regard recall that the Pacific Plate carries the Hawaiian islands north-north west toward the subduction zone next to the Aleutian islands.. Thus the Hawaiian islands are like puffs of smoke carried by a strong wind (here the Pacific Plate) as are several other island groups (and underwater seamount groups as well) in the Pacific Ocean and in the Atlantic. You need to see a echo location (sonar) map of the Pacific ocean floor to see just how dominant a geographical phenomena these island and seamount chains are in the Pacific basin.
Thus there is an interesting possibility here. It is that if you are looking at the Hawaiian islands you are looking at 3 million year interval major eruptions and thus increased heating in the earth, which incidentally would be a result of such a metric jump.
Thus each island (in the Hawaiian islands) ***represents a specific metric change*** occurrence. Thus Oahu (that contains Pearl Harbor) would be the 2.8 million years old metric change, Mona Loa (the big island) the most recent and Kauai the 5.6 my change. Thus this may be evidence in itself of that 3 my metric jump effect.
Kaui island (of the Hawaiian islands) formed at the 5.6myo jump, Ohau at the 3myo jump, glaciation was decreased at the top of the 5.6-3my warm part square wave. At the 3myo jump there came about a separate human species (homo sapiens),

This forms the very convincing $\Delta\varepsilon$ sequence (lower inset of figure 6 above): 2.8my ago, 5.6my ago,..

Thus apparently from the above geological evidence metric change *really is a square wave*!
The movement of plates has caused the formation and break-up of continents over time,

270my Metric Quantization Jumps and Continental Splitting And Resultant Drift

Note these 2.5my metric quantization $\Delta\varepsilon$ jumps. and the resulting formation of the Hawaiian island chain? But the 100X volcanic activity of the 270my metric quantization e jumps had to have caused far larger volcanic effects than those 2.5my jumps. It had to have caused the continents to split apart for example due to increased volcanism along the mid Atlantic ridge in the case of the supercontinent Pangea split.
For example supercontinent Columbia or Nuna formed between 2by and 1.8by years ago and broke up 1.5by to 1.3by years ago (consistent with the 270my metric jump time) Supercontinent

Rodina formed 1by years ago and broke up into eight continents 600my ago and is also consistent with that time interval. The Pangea break up dates (found from undersea magnetic stripe mapping) to at least the beginning of the Jurassic. The Siberian traps also date from near the Permian Triassic transition time. Pangea broke up into Laurasia (later North America and Europe) and Gondwana.

Note the ε metric quantization pulse completely destabilizes this mantle convection cell morphology so that every other time (of a metric quantization pulse) the convection cell can rotate the other direction leading to continents eventually colliding again. Also the East Pacific Rise, etc.. volcanism constraints how far the North-South American continents can move west due to mid Atlantic ridge volcanism.

References

500my sound waves*(ripples)*
http://www.space.com/scienceastronomy/aas_universe_structure_050111.html

3my cycle*. 57th harmonic wave*
more info on your perseus mega cluster
http://chandra.harvard.edu/photo/2000/perseus/more.html
http://antwrp.gsfc.nasa.gov/apod/ap000615.html
http://antwrp.gsfc.nasa.gov/apod/ap030912.html

3,000,000 year event coinciding with a **climate change in Africa 2,800,000 years ago**.
http://cnn.netscape.cnn.com/news/package.jsp?name=fte/stardust/stardust&floc=wn-np

Major biological event at **5.5myo**
with previous evidence that chimps and human ancestors diverged from a common ancestor about 5.5 million years ago."

http://www.sciscoop.com/story/2004/10/11/6174/2171

And, palaeoclimatologists are agreed that **5.6 myo** is a key date in cyclical glaciation.

Major biological event at ***5.6 myo***

The researchers found chimp lice and human lice diverged roughly 5.6 million years ago, consistent with previous evidence that chimps and human ancestors diverged from a common ancestor about 5.5 million years ago."

http://www.sciscoop.com/story/2004/10/11/6174/2171

Hawaiian islands formed at ***3my*** *time intervals of volcanism (Ohau at 3my)*

"The island of Kauai is the oldest of the eight major Hawaiian islands and was formed by a single shield volcano approximately 5.6 million years ago (Stearns 1985)."

http://www.epa.gov/fedrgstr/EPA-SPECIES/1997/December/Day-05/e31839.htm

http://policy.fws.gov/library/00fr2348.html

*Square wave evidence for heating and cooling at **3my** time intervals*

, for one simple reason: from 10 million to 5.6 million years ago, cyclic glaciation was highly active in the Northern hemisphere and glaciation was suppressed between 5.5 million and 3.5 million years ago

http://www.nature.com/cgitaf/DynaPage.taf?file=/nature/journal/v411/n6834/full/411142a0_r.html&filetype=&dynoptions=

830my major biological event
Charles Lyle meeting, paleontological society of London, 5 June 2002
Xun Gu's abstract: "Early Metazoan Divergence was about 830 Million Years Ago.

Major geological event 1.4byo
. At about 1.4 billion years ago, the metamorphic complex was injected with dikes and larger blobs of granitic magma."
http://vulcan.wr.usgs.gov/LivingWith/VolcanicPast/Places/volcanic_past_death_valley.html
And, palaeoclimatologists are agreed that 5.6 myo is a key date in cyclical glaciation.

GIBBS ring of 100,000ky from 254my event

"Again, what causes the earth's orbit to vary from fairly circular to more elliptical <GravInductEMWave.html> every 100,000 years? I believe the root cause is variations in gravity."

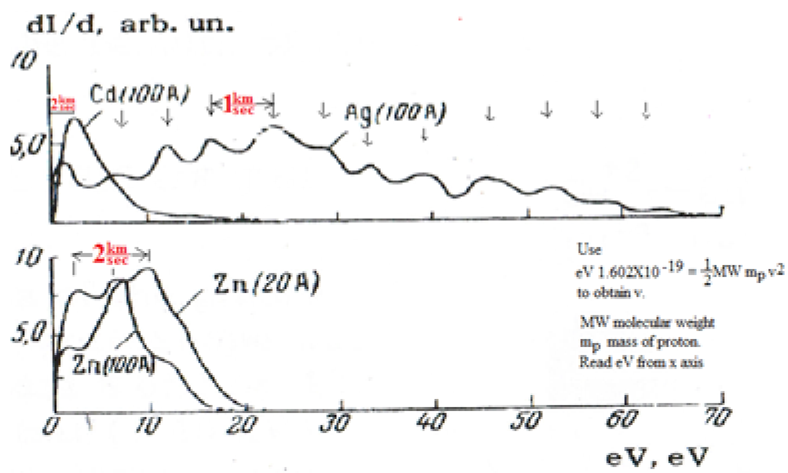
http://www.grandunification.com/hypertext/Earths_100,000_yr_cycle.html

Gravity change linked to ice age cycles!

State of Arizona geology map used for unconformity information.

Laboratory Evidence For Metric Quantization

Recall the 1 km/sec metric quantization (eq.13) observed in many physical situations (see below). Here we have an electric arc in which the intensity as a function of energy is measured.

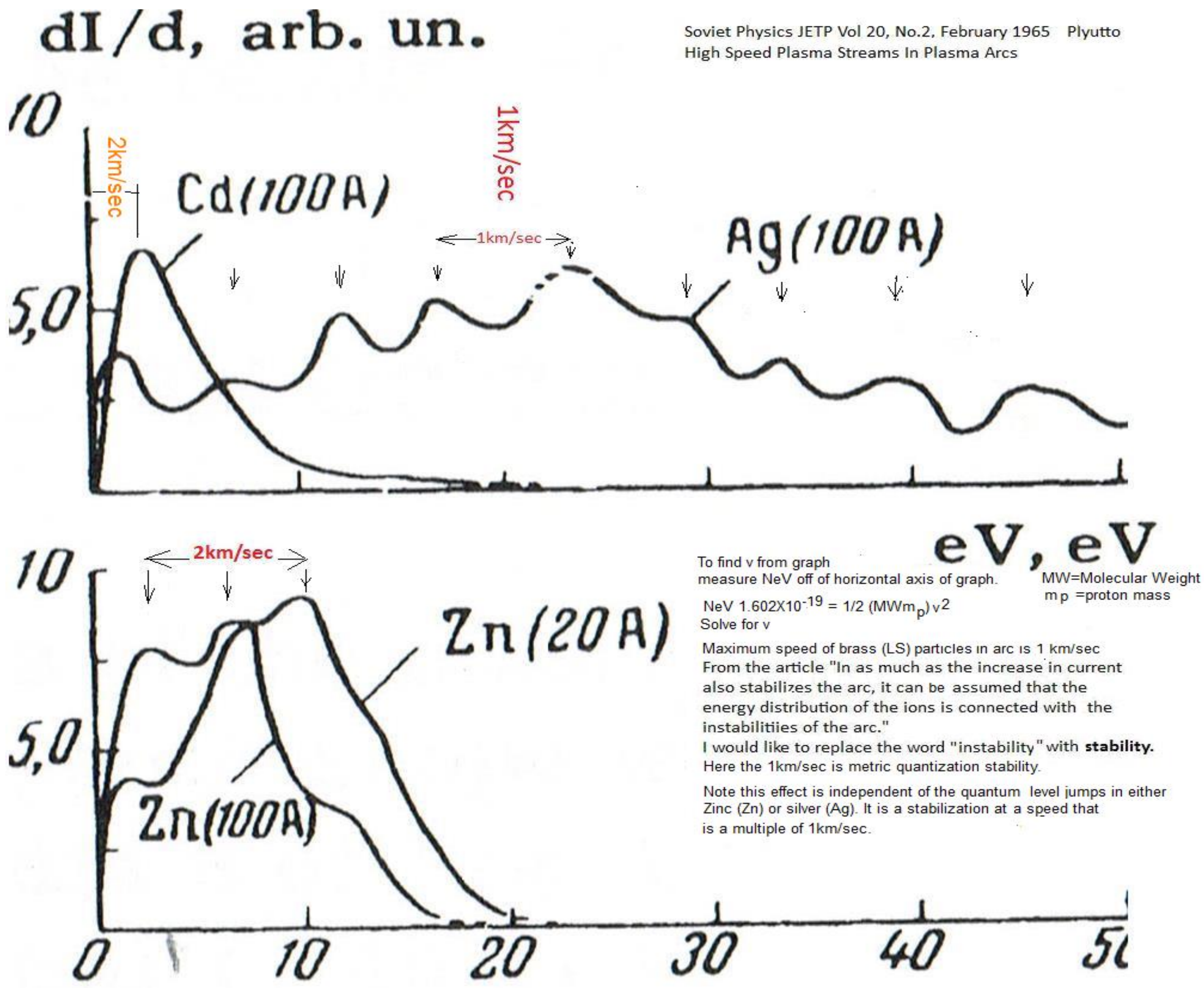


Recall the 1km/sec represent stability regions. We quote from the paper:

"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".

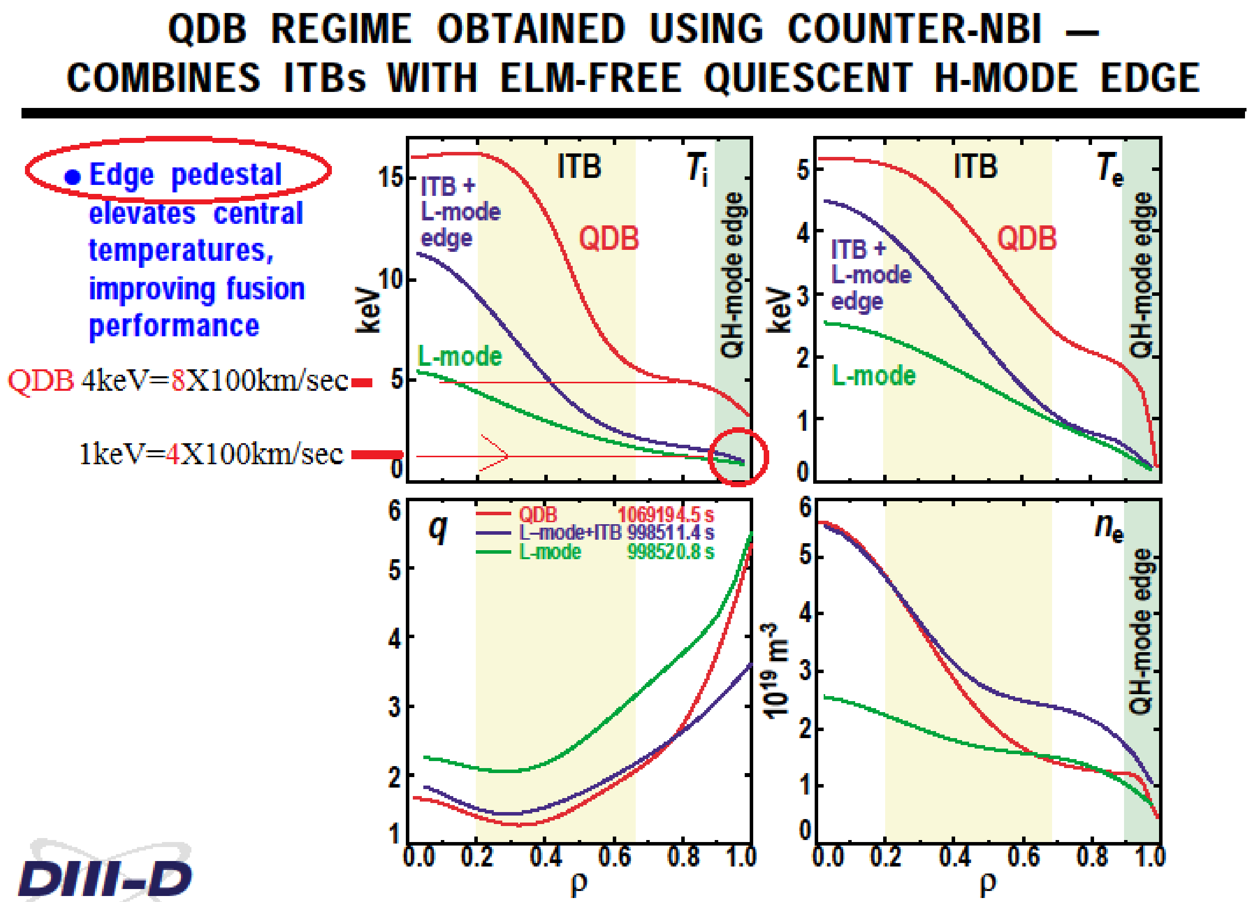
Maximum speed of LS was 1km/sec. LS is brass.



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. This 1km/sec difference is something more universal.
we also see a 100km/sec effect in tokomaks but less distinctly..
You probably are wondering why you can't observe metric quantization in your room for example given that 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.

Metric Quantization In A Tokomak Plasma
Some people have asked me why no one has seen metric quantization in the laboratory. Well, they have and they simply don’t realize what they are looking at.
For example I was wondering whether N100km/sec metric quantization might be used to create stability in a man made plasma. After all metric quantization plays a big role in the sun.
My metric quantization will only work in a isothermal plasma with ion speeds of N100km/sec, where N is an integer. But I have heard of **4**X100km/sec=300km/sec =1keV proton (ion) temperature in the ITB Internal Transport Barrier (L mode +ITB at the QHmode high plasma

density edge where this metric quantization isothermal plasma might be located) in the high density region. So that **4**X100km/sec layer of plasma *is the actual transport barrier* in the newly discovered Internal Transport Barrier ITB phenomena. These ITBs are considered to be the next frontier in Tokamak fusion physics since they are a promising source of stability in plasmas. The ITER in Europe is to be designed around the ITB. So plasma physicists may have already stumbled on to metric quantization stability (ie., that ITB caused by that 4X100km/sec) and not even realized it! The edge pedestal of 4X100km/sec provides the Internal Transport Barrier plasma. This edge pedestal is where the stability source is in this new type of plasma.



Metric Quantization In A Tokomak Plasma

Some people have asked me why no one has seen metric quantization in the laboratory. Well, they have and they simply don't realize what they are looking at.

For example I was wondering whether N100km/sec metric quantization might be used to create stability in a man made plasma. After all metric quantization plays a big role in the sun.

My metric quantization will only work in a isothermal plasma with ion speeds of N100km/sec, where N is an integer. But I have heard of **3**X100km/sec=300km/sec =1keV Deuterium temperature in the ITB Internal Transport Barrier (L mode +ITB at the QHmode high plasma density edge where this metric quantization isothermal plasma might be located) in the high density region. So that **3**X100km/sec layer of plasma *is the actual transport barrier* in the newly discovered Internal Transport Barrier ITB phenomena. These ITBs are considered to be the next frontier in Tokamak fusion physics since they are a promising source of stability in plasmas. The ITER in Europe is to be designed around the ITB. So plasma physicists may have

already stumbled on to metric quantization stability (ie., that ITB caused by that 3X100km/sec) and not even realized it!
To obtain a stable metric quantized plasma over the entire volume of the Tokomak you need a line charge down the middle with a relative potential of 511kV. See Gaussian pillbox illustrations below for the reason.

Metric Quantization And The Calculation Of G
The most recent Physics Today magazine says 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.
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 cause large errors in the torsion constant calculation and therefore the G calculation. The new experiments, with no such motion requirement (e.g.,floating the balls in mercury), will probably finally nail down the gravitational constant.

Appendix C

Theory Behind Galaxy Halo, Stellar Equatorial, Corona, Tachocline Speed Quantization
Here we introduce a generally covariant generalization of the Dirac equation (new pde) $\sqrt{g_{\mu\mu}}\gamma^{\mu}\partial\psi/\partial x_{\mu}=(\omega/c)\psi$ that does not require gauges (eq.1.9, Ch.1, www.davidmaker.com). Solve this new pde with local background metric $g_{oo}= e^{i\Delta\varepsilon}$. From particle mass considerations ε=.06, $\Delta\varepsilon$=.00058 ((1a), Ch.2) in the exponent of g_{oo}. These three values 1, ε, $\Delta\varepsilon$ are responsible for the masses of the three free leptons in that lepton equation (the new pde). Here the $\Delta\varepsilon$ perturbative contribution (to the ε term) in metric coefficient g_{oo} levels off to the quantized value $e^{i\Delta\varepsilon}$ in the galaxy halos and for stellar equatorial velocities: So we should set the Schwarzschild metric g_{oo} term equal to this metric term→

$$g_{oo}=1-2GM/rc^2 \rightarrow rel(e^{i\Delta\varepsilon})=\cos(\Delta\varepsilon)=1-(\Delta\varepsilon)^2/2+.. \Rightarrow$$

$(\Delta\varepsilon)^2/2=2GM/rc^2$. Thus for circular (centripetal acceleration) motion:

$$v^2/r=GM/r^2=c^2(\Delta\varepsilon)^2/4r \Rightarrow$$

$v^2=c^2(\Delta\varepsilon)^2/4=(87km/sec)^2$ after plugging in the values of $\Delta\varepsilon$ and c. So:

$$v^2 = \text{constant} \quad \text{or} \quad v=87km/sec$$

So the metric acts to quantize v. The actual measured velocities include the effects of both the metric and of visible matter. Thus in general $\mathbf{v_{measured}} = \mathbf{v_{metric}} + \mathbf{v_{matter}}$. The quantity $\mathbf{v_{metric}}/\mathbf{v_{matter}}$ is approximately 9, the usual "dark matter" to visible matter ratio (no dark matter here however). So,

$$10+87=97\approx 100km/sec.$$

Thus v is a constant in galaxy halos *when the metric is quantized*. FigureA1 shows many such nearby galaxy halo velocity curves (sections 23.4→ 23.6, (1a)). Note in section 23.4 there also is rotational energy quantization for the $\Delta\varepsilon$ rotational states (of outside object B) that goes as:

(L(L+1)) ∝ ½mv² so $\sqrt{L(L+1)}$ ∝ v. Thus v is proportional to L, L being an integer in figures A1 and A2. Therefore,

$$\Delta v = kL \text{ so } v = 1k,\ v = 2k,\ v = 3k,\ v = 4k\ldots\ v=N(100\text{km/sec})$$

Compare this result with N=2 with figure A1 for galaxy halo velocities and figure A2 stellar class O,B,A equatorial velocities. The N=2, v= 200km/s is ubiquitous (object B). There is a smaller quantized v of 1km/sec (object C) that applies to the sun thereby apparently providing our Δv=1km/sec solar differential rotation and giving that H in the Poynting vector and also the H in the solar cycle calculation above. In that regard the solar equator moves with 2km/sec metric quantization and the equatorial radiation zone rotates with the 1km/sec metric quantization. Thus this 1km/sec metric quantization is the reason for solar differential rotation.
Contents
(1a) http://davidmaker.com

Bode's Law
Recall we have done a lot with that object B N100km/sec metric quantization:
the corona, tachocline, galaxy halo, main sequence O,B, A stars..
But what about that 1km/sec object D metric quantization?

The solar differential rotation is initiated with that 1km/sec. It causes those He304 Gibbs jumps in the sun and the associated X class flare clumps.
Note by the way that metric quantization doesn't happen without
several degrees of freedom as in a the turbulent axis symmetric proto nebula 4.5BY years ago.
It could be that
Titus Bode's Law for planets (only Neptune does not obey Bode's law)
might also be the result of the 1km/sec object C metric quantization

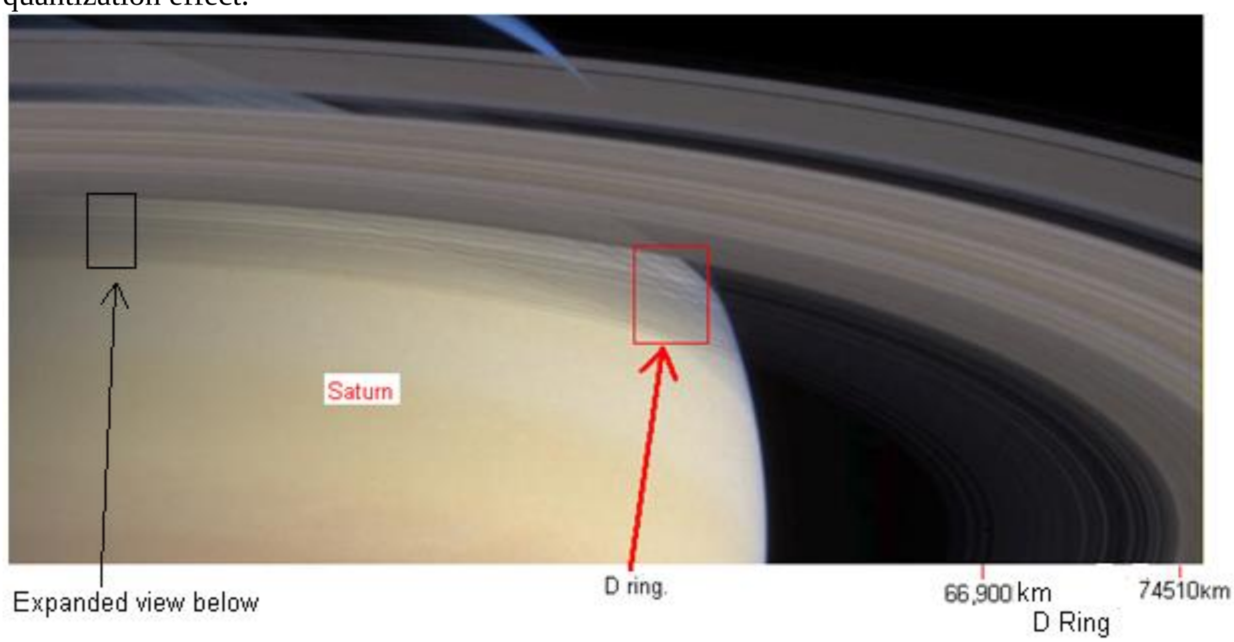
Planet	speed	Delta speed..
..		
Jupiter	13km/sec	**4**km/sec (Jup->Sat)
Saturn	9.57km/sec	
Uranus	6.76km/sec	**3**km/sec (Sat->Uran)
skip		**2**km/sec (Uran->Plut)
Pluto	4.71km/sec	

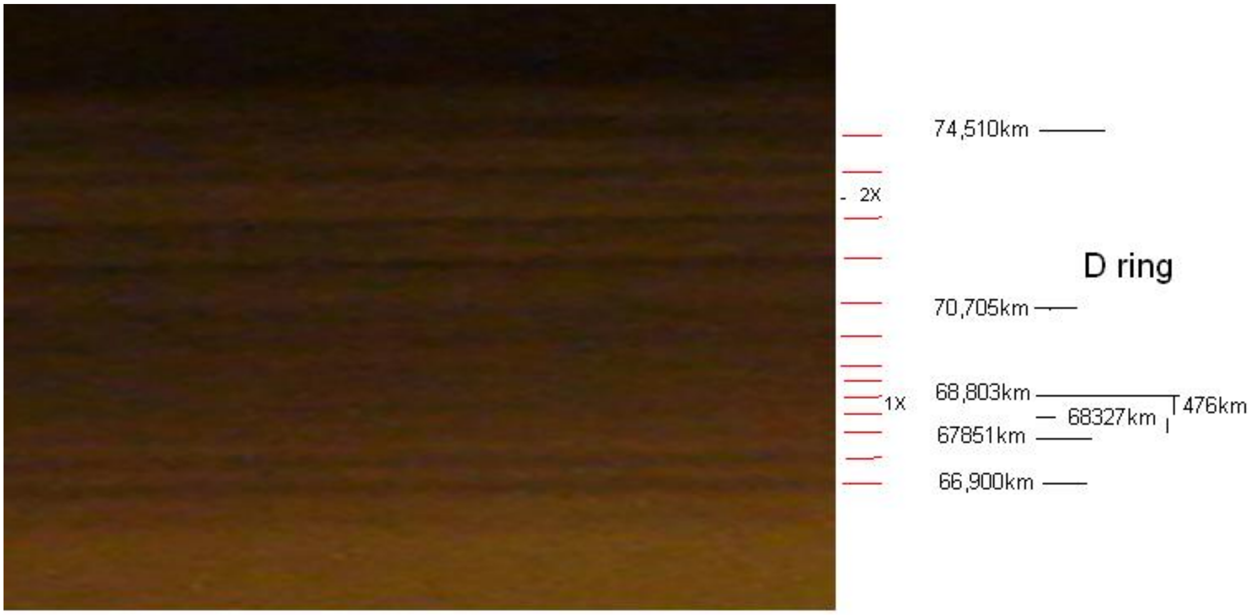
>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>
*After Pluto delta<1km/sec and so Oort cloud type chaos. For example
Eris and makemak are in highly eccentric orbits that don't obey Bode's law,.etc.
Even the 2 to 1 resonances of the Galilean moons of Jupiter exhibit those 2km/sec,3km/sec differences, making those orbits doubly stable!. In the asteroid belt Ceres has a 1km/sec difference between perihileon and aphelion and Vesta has 3 km/sec difference between perihelion and aphelion.
My fractal theory has outside objects (outside our own 10^{11}LY wide object A) B and C create a quantization of the metric ***in***side object A. The result is that dynamic systems with high degrees of freedom have velocity quanitization. For object B the velocities go as 100km/sec,200km/sec,300km/sec,..etc.

For object C it is 1km/sec,2km/sec,3km/sec,.. I noted earlier that galaxy halos and O,B,A stars exhibit those 100km/sec,200km/sec effect, Thus sun G,K,M stars exhibit the 1km/sec,2km/sec, effect which is the basis for my solar differential rotation model.
are here.

D Ring Metric Quantization

My fractal theory has outside objects (outside our own 10^{11}LY wide object A) B and C create a quantization of the metric ***in***side object A. Recall I have given presentations on this subject at scientific gatherings and you have helped with that galaxy halo data. The result is that dynamic systems with high degrees of freedom have velocity quantization. For object B the velocities go as 100km/sec,200km/sec,300km/sec,..etc.
For object C it is 1km/sec,2km/sec,3km/sec,.. I noted earlier that galaxy halos and O,B,A stars exhibit the100km/sec,200km/sec effect, Thus sun G,K,M stars exhibit the 1km/sec,2km/sec, effect which is the basis for my solar differential rotation model.
Anyway, that effect is inside Bode's law, the random motion of comets in the Oort cloud (they hit earth a lot by the way because of that)..
But you should also see the 1km/sec velocity quantization effect in Saturn's rings as well. The shepherding moons complicate this, making the rings more complicated than that equally space ringlets at 1km/sec speed differences. The question comes to mind whether there was some part of the Saturn's rings that did not have a Shepherding moon, you then **should see those equally space ringlets!!** You might even see two levels of metric quantization! The main reason for that curious record player like appearance of Saturn's rings should be this 1km/sec metric quantization effect.





For circular motion in the rings:
Centripetal Force $=mv^2/r=GMm/r^2$. So
$v_1^2=GM/r_1$; $v_2^2=GM/r_2$ .For example we take the outer and inner edge of each ring band:

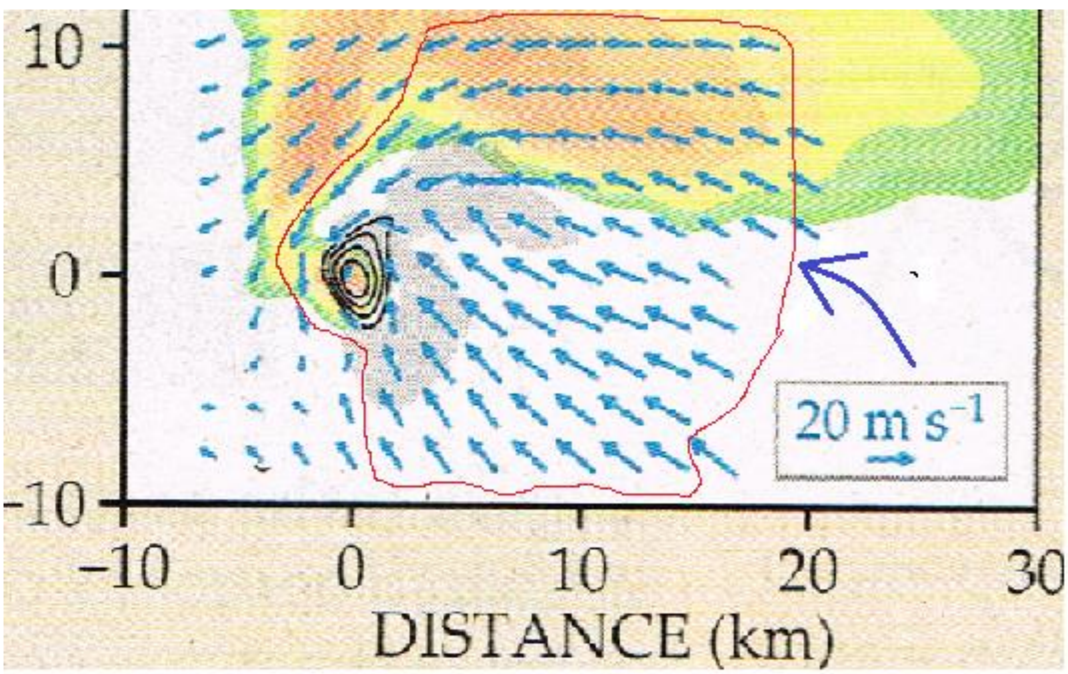
D Ring, 40 Ringlets Can't go any lower
sqrt($6.67X10^{-11}$ $5.68X10^{26}$/66900000)=23800m/sec= inner edge speed
sqrt($6.67X10^{-11}$ $5.68X10^{26}$/74658000)=22530m/sec=outer edge speed
23800-22530=1.27km/sec≈**1**km/sec,
1270/35= 20m/sec between ringlets. Next smaller metric quantization.

C Ring, 84 Ringlets
sqrt($6.67X10^{-11}$ $5.68X10^{26}$/92000000)=20293m/sec
sqrt($6.67X10^{-11}$ $5.68X10^{26}$/74658000)=22530m/sec
22539-20293= 2234m/sec **2**X1km/sec metric quantization speed.
≈1km/sec
2234/84=20m/sec. between ringlets. Next smaller metric quantization

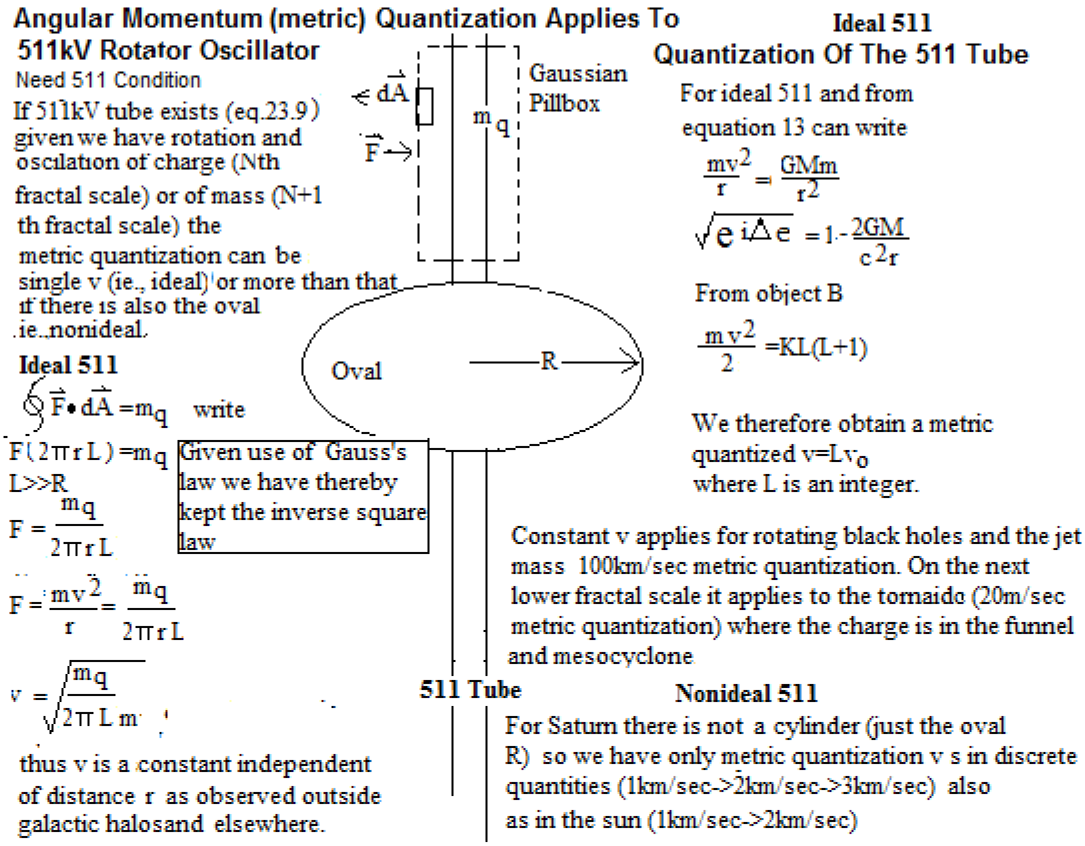
B Ring, Ringlets chaotic
sqrt($6.67X10^{-11}$ $5.68X10^{26}$/92000000)=20293m/sec
sqrt($6.67X10^{-11}$ $5.68X10^{26}$/122170000)=17610m/sec
20293-17610= 2683m/sec=**3**X894.4m/sec metric quantization speed.
894m/sec≈1km/sec

Resonance with Titan causes gaps and chaos in rings
A Ring, Ringlets chaotic. Beyond the Roche division the rings caused by individual moons.
sqrt($6.67X10^{-11}$ $5.68X10^{26}$/122170000)=17610m/sec
sqrt($6.67X10^{-11}$ $5.68X10^{26}$/139380000)=16487/sec
17610-16487= 1123m/sec metric quantization speed.
1123m/sec≈**1**km/sec

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.
Recall from equation 13 (first attachment) there are those 100km/sec $\Delta\varepsilon$, 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 and Don't Know About Tornado Formation" Physics Today, Sept.2014



To induce this effect we also require that 511kV rotator oscillator axial (z) force result of equation 23.9 since that is what provides the vertical pulse inducing the vorticity. So this object has to be at a high voltage as is the case in thunderstorms and given observations of a bright coronas deep inside the vortex of tornados. Also it has to be oscillating, in that regard recall the 'ground thumping' that gives tornados their characteristic seismic signature that has even been used to locate their positions.



Note here we have preserved the Gauss's law form of the inverse square law.

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

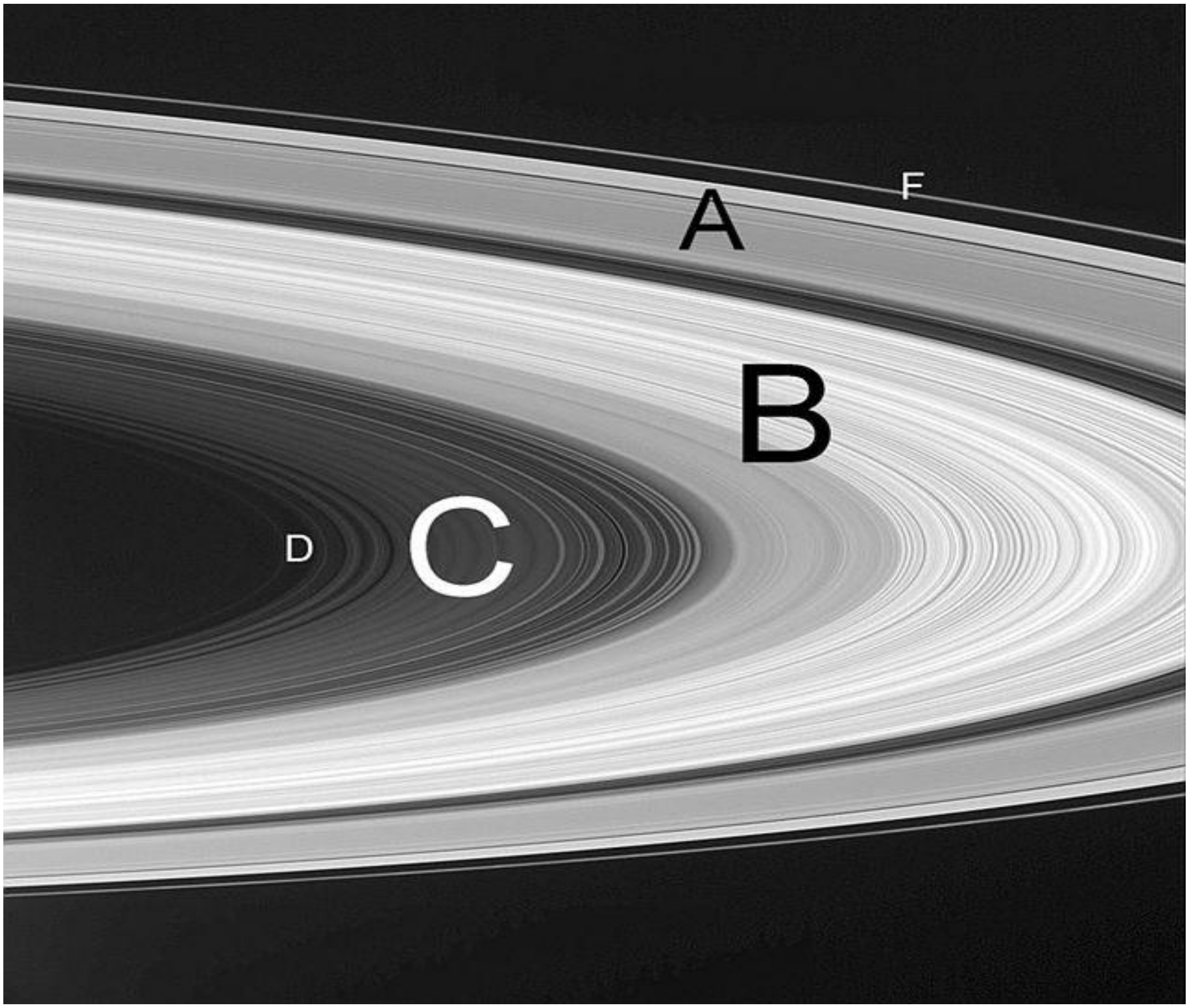
phenomena: cold cycles Pacific volcanic cycles Mass extinctions Dust

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.

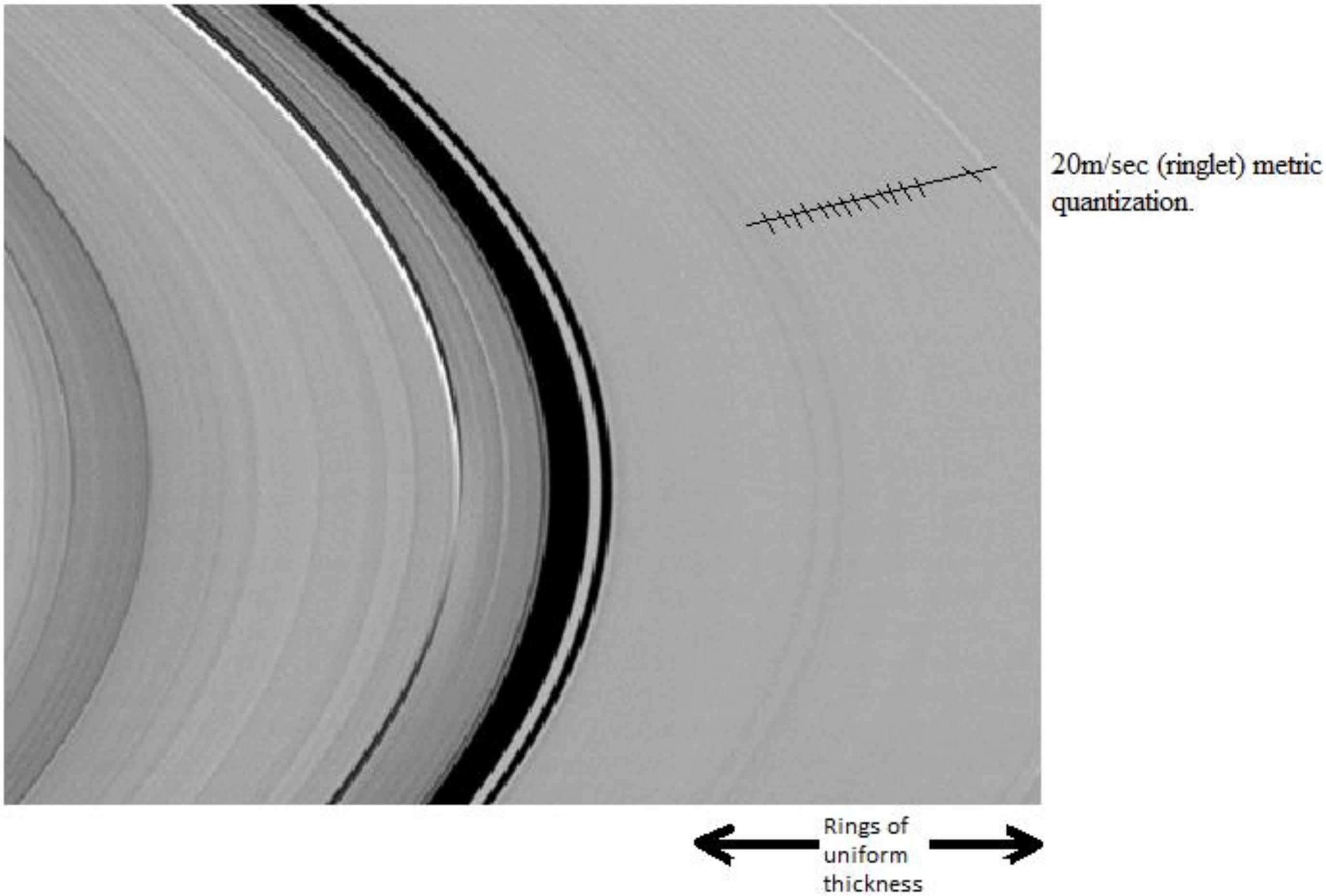
HDF =Hubble Deep Field

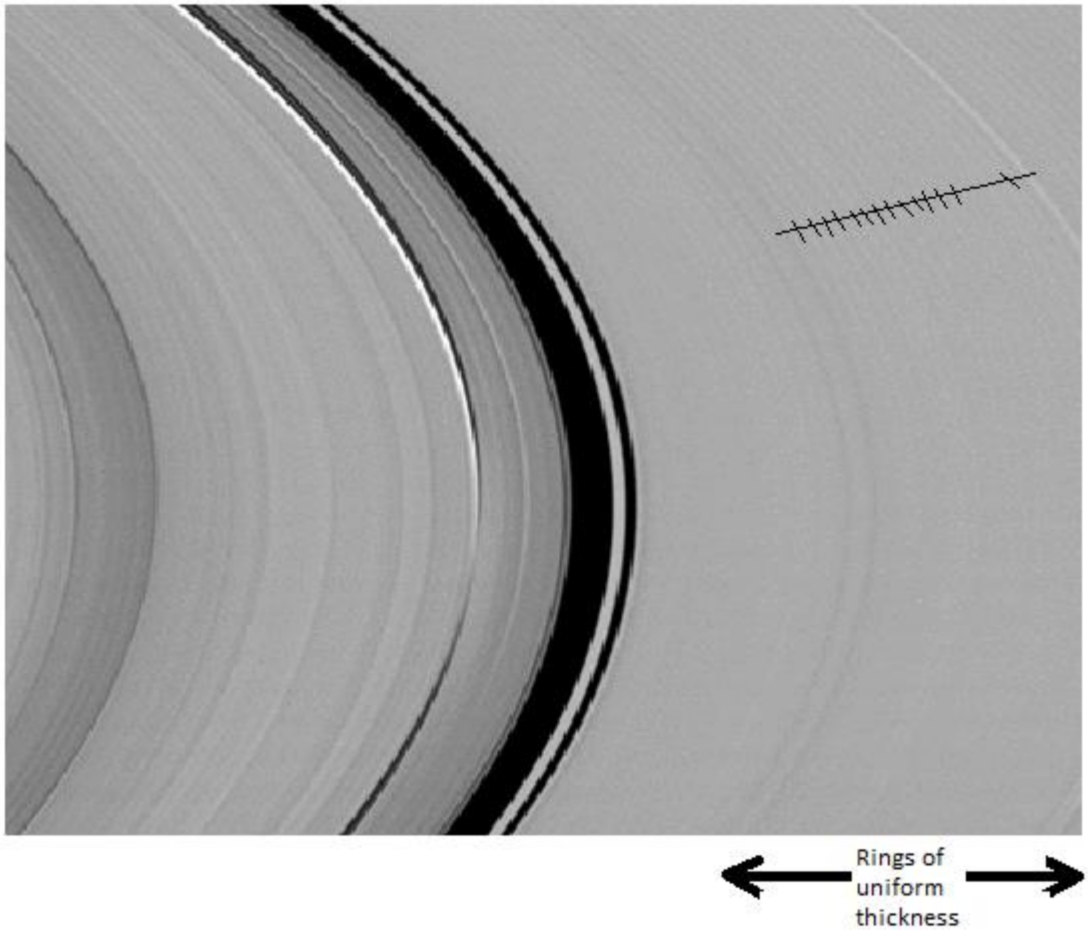


In the most detailed Cassini image of Saturn, there are 5 narrow rings, 8 2X widely spaced rings in the D ring: there are few shepherding moons here, the Roche limit will pull apart just about any big object here, *You see two levels of metric quantization in the D ring*. What an awesome sight, metric 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.

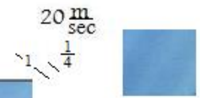

20m/sec (ringlet) metric quantization.
Rings of uniform thickness



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..



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!**

Laboratory Metric Quantization
In Plasmas

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My metric quantization will only work in a isothermal plasma with ion speeds of N100km/sec, where N is an integer. But there is a **3**X100km/sec=300km/sec =1keV Deuterium temperature in the ITB Internal Transport Barrier (L mode +ITB at the QHmode high plasma density edge where this metric quantization isothermal plasma might be located) in the high density region. These ITBs are considered to be the next frontier in Tokamak fusion physics since they are a promising source of stability in plasmas. So plasma physicists may have already stumbled on to metric quantization stability (ie., that ITB caused by that 3X100km/sec) and not even realized it!

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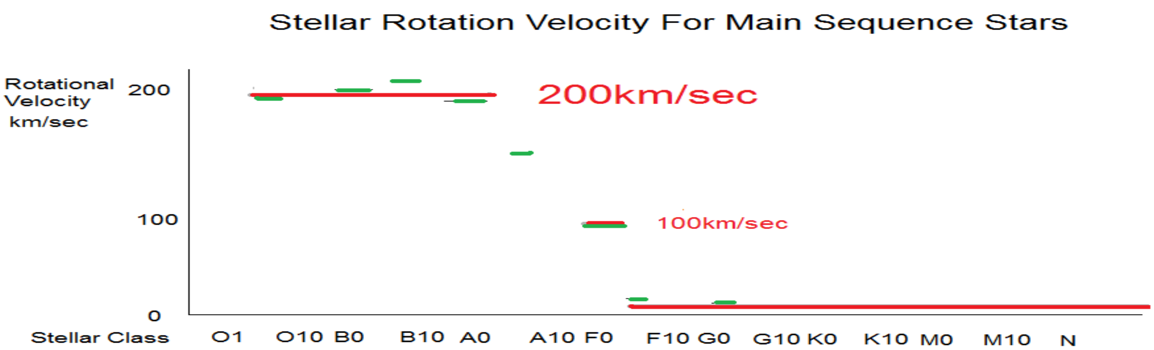
In my view metric quantization is the problem here especially with the experiments that require a moving oscillating torsion bar to measure the torsion constant, where we can then have a grand canonical ensemble with nonzero chemical potential (as in Saturn's rings), the requirement for for that metric quantization to effect relative speeds and here mess up the torsion constant calculation and therefore the G calculation. 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?

Appendix C



Note the region of instability is for the F class to G stars and is in the transition zone from from 100km/sec to 1km/sec.
Note the jump down in the middle region of the HR diagram above should then correspond to instability and it does!