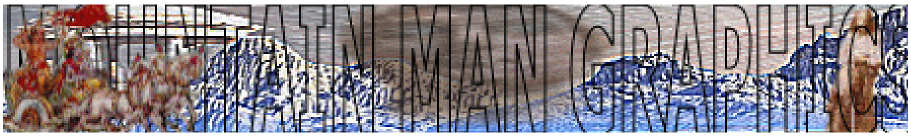

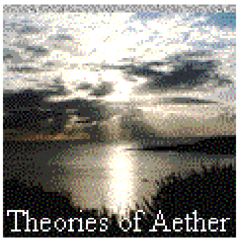

Derivation of Newtonian Gravitation from LeSage's Attenuation Concept

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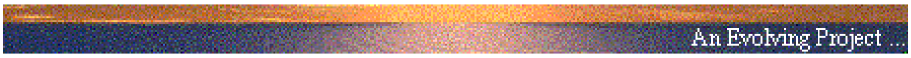

Derivation of Newtonian Gravitation from LeSage's Attenuation Concept

Once fully rendered, one will realize that gravitation is a connective process between matter and the ZPE (Zero Point Energy or aether) field. It not only produces the obvious result we call gravity, but also is the productive agent of elemental charge, inertia (which is why inertial mass is identical to gravitational mass), and the deBroglie wave phenomena.

A long time ago, Lord Kelvin (W. Thompson), Lorentz, Maxwell, and Hemholtz recognized that the behavior of matter had characteristics similar to vortex ring structures in a fluid (the atomic vortex hypothesis). This concept was abandoned in the early 1900's. This abandonment was more philosophical than substantive with the real problem being the math describing the model was, "at the time", intractable. Must more success was being obtained by QM methods. This same model rears up again in modern physics in the form of the mathematical topology of string/super string theory as well as in superconductivity and superfluidity. Penrose's twistor is a vortex ring, as is a magnetic field. It is interesting to note that vortex rings can sustain transverse vibrations (analogous to guitar string vibration), indeed Kelvin proved mathematically that linear disturbances in a saturated 3D vortex fluid (he termed a vortex sponge) would produce propagation of pure transverse waves identical to the equations and properties that describe the propagation of light through space. It was this relationship as well as many others that caused this hypothesis to be considered seriously. It also is interesting to note that Maxwell used this conceptual model as the basis for his derivation of the EM relationships.

Derivation of Basic Gravitational Relationships

It was George Lewis LeSage who in 1784 published a narrative description of the gravitation process as being the result of attenuation of what he described as ultra-mundane particles in material bodies. H. A. Lorentz and G. L. Dawin evaluated this process mathematically and came to the (correct) conclusion that for this process to work, a power dissipation would occur causing a continuous loss of energy from the attenuation process into matter. Since at that time, there was no known indication that this occurs in matter, the concept was rejected due to an obvious violation of the conservation of energy. Feynman argued against the premise claiming that the magnitude of dissipation required to create the observed gravitational field would, of necessity, cause a body such as the earth to become white hot and the resulting drag would have spiraled the earth into the sun long ago. This is not a necessary requirement. The solution the this Feynman argument is the same as the similar argument for the atmosphere relative to the earth's surface.

The basic gravitational relationship as identified presumes that the ZPE (aether) interacts weakly with the vortex rings that constitute matter. The "macro" effect of a spherical body immersed in this field is derived herein. The derivation below is for any point of evaluation (P) that is external to a spherical material body.

Note that the distance from P to the center of the body will be denoted as R. The radius of the body is denoted as r_o. The tangential angle is denoted as a_o. Any path traversing the sphere may be represented by line. The traverse distance within the sphere along this line is denoted as x. The relationship between x, r_o, and r is given by geometry as:

(x / 2) = (r_o + r)(r_o - r) = (r_o^2 - r^2) {A.1}

The (momentum) flux at point P along any such line will be affected by the interaction of the field within the sphere. This interaction will be the transfer of of some momentum/energy from the field into the ring structures. This general interaction gives rise to a standard thin-shield reduction equation of:

Fee = Fee_o e^(-ux) {A.2}

where Fee is the flux after interaction, Fee_o is the initial flux, u is the attenuation (Transfer) coefficient (in units of inverse length [u = rho u_s, where rho is density, and u_s is mass attenuation coefficient]), and x is the travel length in the sphere along any arbitrary line.

Because of the possibility of scattering (multiple interactions in shields of sufficient thickness), this equation is expanded using a "buildup" term, B. This buildup term corrects the equation for multiple scattering events that will contribute to point P that were not along the original path of the line. The buildup term will depend on the relative importance of each of the three possible interaction modes (removal, scattering, and slowing) in the body, the shape of the body, the size of the body, and the distance of the body from point P. The corrected general removal equation is:

Fee = Fee_o Be^(-ux) {A.3}

Determining the overall directional momentum flux (or current) due to the body at point P, one notes that (in an otherwise isotropic medium) the flux from all directions is identical except for the paths that traverse the body. These interaction paths have their momentum reduced according to the flux attenuation equation. In the isotropic medium, for each of the interaction lines there is another from exactly the opposite direction that has no interaction. The net flux at point P is then given as the sum (integral) of the momentum of all paths from the left and the right of point P. All paths outside of angle a_o are matched exactly by its opposite. The net contribution of paths outside of angle a_o is therefore zero. The contribution of the attenuation within angle a_o can be determined by the difference between the momentum from the left and the momentum from the right:

Delta Fee = (Fee_o - Fee) dOmega = (Fee_o - Fee)(dr / R)((r dTheta) / R) {A.4}

The sum of all such paths is then given by the integral:

Integral [Fee dOmega] = Double Integral [(1 / R^2)(Fee_o - Fee)r dr dTheta {A.5} which yields:

Fee_net = 1/R^2 Integral(0-2pi) dFee Integral(0-r_o) Fee_o(1-B(-ux)e^-ux)r dr {A.6}

and resolves to:

Fee_net = 2pi Fee_o/R^2 Integral (0-r_o) (1-B(-ux)e^-ux)r dr {A.7}

Noting that x may be replaced by:

L = Sqrt(r_o^2 - r^2)

x = 2L {A.8}

provides the general solution:

Fee_net = 2pi Fee_o/R^2 Integral (0-r_o) (1-B(-2uL)e^-2uL)r dr {A.9}

The Weak Solution:

The weak solution to the above equation is given when 2u[Sqrt(r_o^2- r^2)] is much less than 1. This is the case for very weak interactions (of any kind) when only a small fraction of the ZPE's momentum flux is removed by (deposited in) the body. In this case the buildup term is essentially 1 (there is no significant scattering), and the exponential term may be replaced by the first two terms of the power series approximation. This weak solution simplifies to:

Fee_net = 2pi Fee_o/R^2 Integral (0-r_o) (1-(1-2uL))r dr {A.10}

simplifying further:

Fee_net = 2pi Fee_o/R^2 Integral (0-r_o) 2uLr dr {A.11}

and:

Fee_net = u4pi Fee_o/R^2 Integral (0-r_o) Lr dr {A.12}

integrating the above equation gives:

Fee_net = u4pi Fee_o/R^2 [L^(3/2)/3] {A.13}

which resolves to:

Fee_net = u4pi Fee_o r^3/3R^2 {A.14}

This equation may be further rearranged to give:

Fee_net = Fee_o/R^2 [u4pir^3/3] {A.15}

It can be seen from the above equation, that for a weak solution, that the bracket term is an alternate form of mass derivation (volume, mass density, and a mass interaction coefficient u_s [u_s = u / mass density]).

This equation can be related to total mass M as:

Fee_net = (Fee_o u_s/R^2)M

The Strong Solution:

The strong solution to equation A.9 is given when $2uL$ is much greater than 1. This is the case for very strong interactions (of any kind) or when the body is very large. In the strong solution case, essentially all of the momentum (and energy) is deposited in the absorbing body. In this case, the buildup term is inconsequential because all of the field momentum flux is absorbed. The exponential term goes to zero. This strong solution simplifies to:

$$Fee_{net} = 2\pi\, Fee_o/R^2 \int_{0}^{r_o} r\, dr \quad \{A.17\}$$

integrating:

$$Fee_{net} = 2\pi\, Fee_o\, r_o^2/2R^2 = \pi\, Fee_o\, r_o^2/R^2 \quad \{A.18\}$$

This equation may be rearranged to give:

$$Fee_{net} = Fee_o/R^2\, [\pi\, r_o^2] \quad \{A.19\}$$

where r_o is less than or equal to R.

It can be seen from the above equation that for the strong solution, the "mass" of matter (the field momentum to matter interaction rate) is not important. The gravitational interaction is only proportional to the cross-sectional area seen at point P. The matter mass of the body is irrelevant. Thus there is a maximum gravitational field (the difference between the normal ZPE (aether) field momentum flux on one side and nothing on the other).

The Two-Body Problem:

The field flux (or gravitational field) equations determined above provide a description of the effect on the ZPE (aether) field due to a single body. If a second body is placed at the point P evaluated above, it is affected by the net field momentum flux (or current) with which it interacts.

If the second body is a weakly interacting body, then it will interact with the net momentum flux (and experience an acceleration) proportional to its interaction constant and volume. The net gravitational interaction (force) will therefore be:

$$F = Fee_o/R^2\, [u_1\, 4\pi\, r_1^3/3][u_2\, 4\pi\, r_2^3/3] \quad \{A.20\}$$

Since:

$$u = u_s(\rho) \quad \{A.21\}$$

this equation resolves to:

$$F = (Fee_o\, u_s^2) M_1 M_2/R^2 \quad \{A.22\}$$

which is the standard gravitational force equation. The experimentally derived constant G can be seen to be:

$$G = Fee_o\, u_s^2 \quad \{A.23\}$$

Thus we find that A.22 is the familar Newtonian Equation

$$F = GMm/R^2$$

From the above equation we see that for the standard form of gravitational force equation, the gravitational force constant is simply the product of the general ZPE (aether) momentum flux and the square of the attenuation coefficient of matter rings with the ZPE (aether) field. The gravitational constant thus contains both the ZPE (aether) momentum flux and its rate of interaction with the vortex ring structures.

In any isotropic particle field, the momentum flux (momentum per unit area per unit time) may be found by:

Fee = rho v^2/3 {A.24}

where "rho" is the density of the medium and is the average speed of the particles. We can show that epsilon not (eps_o) is the measured mass density of the ZPE (aether) field. We identify the speed of light (c) as the average particle speed divided by the square root of 3. Therefore, the above equation becomes:

Fee_o = eps_o v^2/3 = eps_o c^2 {A.25}

and substituting equation A.25 into equation A.23 gives:

G = eps_o c^2 u_s^2 {A.26}

Characteristic Field Acceleration:

The above two-body equation also clearly shows the acceleration that a material body will experience in a field current (momentum flux gradient). Using the standard F=ma equation for force and acceleration gives a = F/m and:

a_1 = Fee_o u_s^2 M_2/R^2 = Fee_net u_s {A.27}

Using equation A.23 also gives:

a = eps_o u_s^2 M/R^2 {A.28}

Note that in the case of a weakly interacting body the acceleration resulting from this type of field current is not dependent on the mass of the body. Thus any such matter body responds to a field current in the same manner (regardless of its mass). The important concept here is that field current creates an acceleration independent of mass, the resulting "force" is only a by product of this acceleration. This clearly demonstrates the derivative reason for the postulated "principle of equivalence".

Development of a General Gravitational Force Equation (General Relativity):

The above equations are simplified. They are based on the assumption of a non-rotational motionless body(ies) of uniform matter density and does not account for the finite transmission speed of the ZPE (aether) media. The more general equation would include these (rotation, non-uniform matter densities within the body, motions of the bodies, propagation speed of the ZPE (aether), and would make a provision for independent currents within the ZPE (aether) Field). Such inclusions will, of necessity, lead to the derivation of the General Relativistic Metric.

THE "LeSage" EFFECT (Gravitational Induction Heating):

Note the power dissipation (deposited [d]) of the ZPE (aether) field momentum into vortices would by definition result in an energy buildup. The equation that describes this (as a bulk process on a per unit area [Flux {f}]) is simply:

f_d = f_in - f_out

and for the weak solution we find that:

Where u in this case is a linear attenuation coefficient and L is the "effective" travel length through the material body

f_out = f_in[1-2uL]

Thus

f_d = f_in[2uL]

Gravitationally we have related this 2uL to 2GM/c^2r_o^2.

Thus:

f_d = f_in[2GM/c^2r_o]

We see from the above equation that everything is constant except for M and r_o (M is the mass of the body and r_o is the physical radius). Thus we can simply write:

f_d = KM/r_o

where K contains all the constant terms.

So what is K? (Big step here derivation not shown!)

K = (aGe^2/2pi h)/(4pi) = 2.41E-19 m/sec^3

[K can also be back calculated based on a known output {such as the measured anomalous net output of a large astronomical body}]

Where:

a = alpha (Fine structure constant)
G = Gravitational Constant
e = elemental charge
h = Planck's constant

THIS IS THE FIRST UNIFIED FIELD EQUATION (that I know of)! Equating the gravitational field potential to the thermal energy and black body EM emission of the gravitating material body.

The full equation using a lumped heat response model is:

f_d = (KM/r_o^2)(1 - e^-Ht)

and H is:

H = [U(4pi r_o^2)]/[MCp]

```
        Where:  U is the OVERALL heat transfer coefficient
                Cp is the heat capacity at constant pressure
                t is total time of existence in seconds
```

Here are the results of this equation for known astronomical bodies:

Body	Mass	Radius	Net Flux	Predicted Flux	Difference
Moon	7.4E+22	1.74E+06	0.01	.01	-2.5%
Earth	6.0E+24	6.37E+06	0.06	.034*	?

Jupiter	1.9E+27	7.18E+07	6.60	6.40	3.4%
Saturn	5.6E+26	6.03E+07	2.30	2.20	2.7%
Uranus	8.6E+25	2.67E+07	0.76	0.78	-2.1%
Neptune	1.0E+26	2.49E+07	0.76	0.97	-27.3%

```
      * the earth IS NOT in thermal equilibrium!
          It emits .06 watts/m^2 thus U = .06/delta T.
          Given delta T is on the order of 10,000 degrees K,
          U = .06/10,000 or 6.0E-06.  H is therefore,

      H = [(6.0E-06)(4pi)(6.374E+06)^2 ]/[(6.0E+24)(500)]
      H = 1.02E-18 (1/sec)
      t = (5E+09)(365.25)(24)(3600) = 1.58E+17 sec
      Ht = .1612

          (1-e^-.1612) = (.149)(.227) = .034
```

Due to the method employed, this resulting number has a rather high uncertainty and total power is the integration of this flux deposition over the total surface area (which is simply 4pi r_o^2)

thus:

P_d = 4pi r_o^2 (KM/r_o) = 4pi KMr_o

and

4pi K = aGe^2/2pi h

Here is the punch line. The individual ZPE (aether) quantum impact the vortex rings, exciting the rings to vibrate just like a guitar pick striking a guitar string (good old string/superstring theory). This "Brownian" excitation WILL create resonances within the masses of rings.

In a perfect medium (bulk viscosity approaches 0), the relationship of fluid particle speed (v) to bulk transverse wave speed (c) is: v = sqrt(3)c where the Sqrt(3) is simply the geometric transform into three equal orthogonal components.

Now consider a small volume element that contains two such vortex rings, one must realize that a vibrational change in one ring couples to the other. The vibration dilates/contracts the ring (resulting in volume/area changes of the ring) and will result in a responding sympathetic distortion of the second ring. This is a result of the fact that volume of the element will tend to remain constant. The resulting coupling factor will consist of square root of 3 (1.73...[the relationship of particle speed to wave speed]), the geometry of the ring (4 PI^2 [the area geometry of a toroidial ring]), and 2 because it is the interaction of the rings. This would lead to numeric constant that would be definitive of these interactions. This term is the inverse of the fine structure constant alpha (a). Alpha (a) then is simply:

```
      1
a  =  ------------------------
      2[Sqrt(3)(4 PI^2)]
```

which is 1 over 136.76...

```
       However. a more basic coupling
       would be simply 2a = 1 / (Sqrt(3)4PI^2).
```

This ends phase one, the explanation of the basic cause of gravitation,
as well as the definition of the fine structure constant.

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