An Alternative Depiction of the Sub-Atomic Model

By

Murray E. McGill FLMI, BSC

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I hereby declare that I am the sole author of this thesis.

This is a true copy of the thesis, including any required final revisions, as accepted

by my examiners.

I understand that my thesis may be made electronically available to the public.

Abstract

This thesis is an alternative model of the sub atomic structure based on three premises:

1. The fundamental make-up of matter
2. The rotational rate of matter
3. The non-planar rotation of matter

From these three assumptions I will unify the four fundamental forces and redefine the base understanding of magnetism.

Further this will rewrite our quantum model and Einstein's relativity, as it relates to quantum.

This is a tall order and if I was afraid of appearing a fool, I wouldn't have submitted it. But, the quest for understanding requires us to sometimes stand alone and look the fool. "Our knowledge can only be finite, while our ignorance must necessarily be infinite" (Karl Popper)

This paper is written in a Copernican style, but with enough substance to convey understanding of this alternative model. This understanding leads to the demand for further inquiry.

Acknowledgement

I would first like to thank my mother. Even though we had limited resources she would order science "Digest". Small books about science that perked my interest at an early age.

I would also like to thank my children for their willingness (and sometimes less so) my expression of the early components of this thesis. (Jason, Amanda, Christopher, and Emily-Ann)

Finally, I have the deepest respect for science and scientist. We after all stand on the shoulders of giants. That the understanding that they provide, used wisely can improve the quality of life for human kind.

The First Approximation $F_g = F_e$

Premise 1:

The base particles of all matter are Positrons and Electrons. All other sub-atomic particles are composed from these base particles.

The 1st approximation of the radius of an electron.

1) $F_g = F_e$

2) $\dfrac{Gm_1 m_2}{r^2} = \dfrac{K_e q_1 q_2}{r^2}$ where r = 1m   note: (-) denotes an electron a
(+) denotes a positron
e' is the diameter of a base particle

(+)(-)   (-)(+)
P1   P2   where P1(particle 1) is separated from
P2(particle 2) by 1 meter [from P1(-) to P2(+)]

3) $Gm_e m_e = k_e[1/(1-e')^2 - 2/1^2 + 1/(1+e')^2]$

4) $\dfrac{Gm_e m_e}{k_e} = \dfrac{(1+e')^2 - 2(1+e')^2(1-e')^2 + (1-e')^2}{(1+e')^2(1-e')^2}$

5) $= \dfrac{1 + 2e' + (e')^2 - 2 + 4(e')^2 - 2(e')^2 + 1 - 2(e')^2 + 1 - 2e' + (e')^2}{(1+e')^2(1-e')^2}$

6) $= \dfrac{6(e')^2 - 2(e')^4}{(1+e')^2(1-e')^2}$ note: e' << r, r=1

7) $= 6(e')^2$

8) $e' = 4.004 \times 10^{-24} m$ average diameter of a base particle

9) $e'_r = 2.002 \times 10^{-24}$ average radius of a base particle

Note:

$$\frac{Gm_1m_2}{r^2} = m_i a$$

$m_1 = m_i$ $a = gm_2/r$

Therefore: inertial mass = gravitation mass. This implies that gravity permeates through all space. But we are equating that the gravitation force = electric force.

The 2nd Approximation $F_g = K_e c^2/r$

When modelled using simple cubic packing with r = 7.625 where 1 = e'
The maximum number of particles = 1856

$$F \quad = \quad \frac{K_e\, m_e\, c^2}{2 r_e}$$

$$= \quad 1.58818 \times 10^{16}$$

$$F_e \quad = \quad \frac{K_e \times i e^2}{e_r^2}$$

$$= \quad 7.8816 \times 10^{15}$$

$$F/F_e \quad = \quad 2.0070$$

$$r \quad = \quad \frac{r^2 \times i e^2}{M_e\, c^2}$$

$$= \quad 4.7815 \times 10^{-24}$$

$$r \quad = \quad 2.3908 \times 10^{-24}$$

This approximation demonstrates that gravity is the difference between the charged particles. This would be expressed as a wave as all "clumps" of matter would rotate @ the same frequency (see Nucleosis)

A Non Anti-Matter Universe

To have a universe with only neutrons, protons and orbiting electrons. The electron radius must be slightly larger than that of the positron. (E.G. 1.5r vs 0.5 r)

If the electrons radius was larger than the positron's when the particles were undergoing centrifugal forces; the electron would extend slightly farther from the centre of a clumped mass. This small extension from the centre of the nucleus would create a strong tendency for orbiting particles to be electrons. This would be from the larger centrifugal forces acting on the electron vs the positron.

Non-Planner Orbit of the Electron

From observations we know that the electron has a ½ spin, or that the it rotates 720⁰.

If we assume that the electron has a non-planner orbit, with one axis double the other, the orbital equation becomes.

Arc Length   = $[(4\pi r)^2 + (2\pi r)^2]^{\frac{1}{2}}$

              = $(20)^{\frac{1}{2}}\pi r$

Velocity   = $\left[(\frac{Gmm}{r})^2 + (\frac{Gmm}{r})^2\right]^{\frac{1}{2}}$ At large distances the force constant is G

              = $(2)^{\frac{1}{2}}\frac{Gmm}{r}$

Period   = $\frac{Arc\ Length}{Velocity}$

              = $\frac{(10)^{\frac{1}{2}}\pi r^2}{Gmm}$

$\therefore Period \ \alpha \ radius^2$

Double the radius = 4 x the period. The particle will maintain its relative location with a point of the sphere. In this case with this model, the electron maintains its relative location with a proton.

This generates our wave equation to

A sin(θ)cos(ɸ) + B cos(θ)sin(ɸ)

This is simply, a three-dimensional wave equation, that can easily fulfill the Schrödinger equation requirement.

We also know that the frequency of θ = 2ɸ as the spin is ½ or it rotates 720⁰.

What we have is an electron that has a fixed location relative to the nucleus.

We also know that the $Period \ \alpha \ radius^2$. Meaning that the orbital period = n and the radius is r^n. The binding energy of the electron is $\frac{E_0}{n^2}$.

The only other uncertainty is the eccentricity of the orbit. The larger the value of n the larger the orbit an electron has. The more eccentric the orbit could be. This model is consistent with the observations that there are small differences from the expected wavelength emitted when an electron changes orbit. This difference would be based on the eccentricity of the orbit.

Further investigation (modeling) would need to be performed to determine if this model would predict fixed eccentricity of the orbit when under the influence of a magnetic field. This may have to do with the interaction with other nuclei in order to maintain a fixed gravitational wave.

The Strong Force

When we model two protons (made of an unbalance number of electrons and positrons) with a neutron (made of a balanced number of electrons and positrons) between them.

🔴   -   Positron

🟢   -   neutron

🔴🟢🔴

The neutrons and positrons are rolling masses in contact with one another. This motion maintains the distance from the unpaired positrons at a fixed distance. When modelled, the total forces at a point between the neutron and proton creates a final attractive force that is approx. 1.3708 electric charges. The force of attraction on either unpaired positron is approx. 0.61146 electric changes.

This means that we have a stable nucleus. This nucleus, for this model will have spheres in rotation at the speed of light (c).

The Weak Force

The weak force is simply the Roche limit when an electron is knocked from its stable orbit around the nucleus.

An unstable orbit is when the electron is not rotating with the unpaired positron in the nucleus. When the electron travels close enough to the nucleus it can dislodge an electron, positron pair.

When the pair leaves the rotating nucleus, it leaves at the angular velocity equal to that of the nucleus. In this model that velocity is the speed of light. Any additional force would result in a rotating pair. The rotation rate of the pair would observed as it's frequency.

The positron, electron pair, would have thee degrees of freedom. This would allow the frequency to be set up as a wave packet. This wave packet would be the frequency of the independent rotations ($\Delta\theta$, $\Delta\phi$, $\Delta\Upsilon$ or pitch, yaw and roll)

Magnetism

From this model we can ascertain that photons are not emitted due to magnetic force but from the Roche Limit. This is the attraction of electric charges as the unstable electron approaches the nucleus.

For stable electrical orbits near the nucleus the forces would be in balance. The question then arises then what is the magnetic force?

Under this model a "magnetic field" would be created perpendicular to the path a free electron. A Bound electron's orbit would be slightly altered to be in phase with the path of the free electron

Free Electron   (f)
Bound Electron   (b)

   1) BEFORE   (f) →
                                  (b) ↓
   2) AFTER   (f) →
                                  (b) ↑

This movement of the bound electron would create slight local distortions of the gravitational frequency.

This modification of our interpretation of magnetism at the sub atomic level is changed. This has no real impact on the Maxwell equations.

Note: In this model the positive charge is rotated about the nucleus, cancelling out most of the induced perpendicular force. There will be minimal pulsed differences. Based on the distance of the non-paired positron and the orbiting bound electron.

Recap of the Four Fundamental forces and Magnetism in this Model

Gravity – The alternating difference in charge potential of the electrons and positrons. In our location of the universe, this charge potential is primarily from the nucleus of atoms. All atoms would be rotating in complete synchronicity with each other. This creates an alternative pulse or wave.

Electric Force – this is the only fundamental force. There are two varieties, positive and negative. The negative particle has a slightly larger radius. All other forces are a result of this force.

The Strong Force – This is the attractive force of neutrons and protons, to one another due to the electric force.

The weak force – This is the Roche limit as electrons change from a stable orbit to one that is unstable. This results in a shear force of the electron onto the nucleus.

Magnetism – The perpendicular movement of bond electrons from the path of a free electron. This creates a pulse of electric charge. This pulse is more localized & stronger that that of gravity, and at a different frequency.

Quantum

Based on this model where all matter is composed of electrons and positrons; we would expect any number of smaller particles, that could arise from high energy collisions.

This would range from a positron/electron pair, to much larger either balanced or unbalanced charges. All particles from these collisions would be expected to have mass. Simply a non-neutral gravitational attraction.

Non-spherical charged particles could appear to have partial charges. These "partial" charges would be result of partial cancelation of charges. The simple 2d model below would illustrate the partial unbalance charge.

```
              (-)
           (-)(+)(-)
        (+)(-)(+)(-)(+)
```

Relativity

In this model, all particles would attempt to maintain a universal pulse or rhythm (gravity). The total energy for a particle to escape from a nucleus would be equal to the total the escape energy of the nucleus plus any net gravitational energy.

The revolutional frequency of the nucleus would be dependent on the relative location of the particles with one another. If a particle were to orbit a larger mass of particles. The nuclear frequency would decrease, to maintain the net universal pulse.

External rhythm
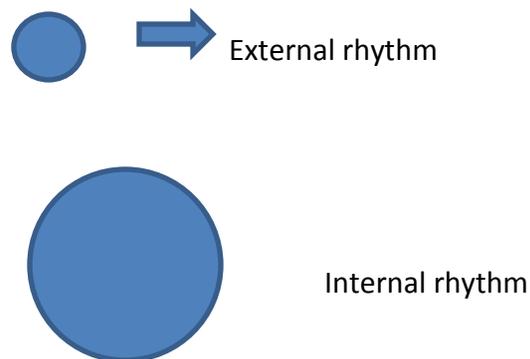
Internal rhythm

If the relative mass differences were significantly different the larger object would in effect maintain its internal rhythm and the much smaller object would decrease its rhythm to match the larger object.

The rhythm would decrease in relation to the difference in velocity of the smaller object to the larger one. The force on all particles on the surface of the nucleus would increase as the square root of the force. $\left(1 - \frac{v^2}{c^2}\right)^{\frac{1}{2}}$

There would be a simple relationship between the total energy and the relative velocity of the objects to one another; as well as the gravitational force.

Nucleosynthesis

This model would introduce a small change to the existing model of the "Big Bang". This change would be prior to the formation of neutrons.

Initially there would only be positrons and electrons. Not all electron positron collisions would result in an electron positron pair as all collisions would be perfectly elastic.

Only low energy collisions would result in the clumping of positron electron pairs. This would only be possible under high density situations.

(+)

(+)
(-)

(-)
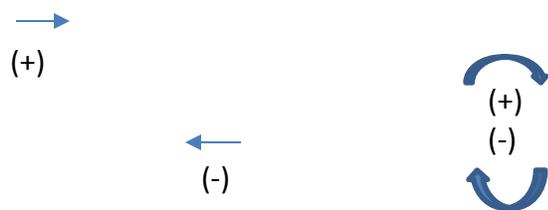
This would result in rotating pairs. The rotating pairs wold result in other rotating pairs to rotate in synchronicity. (early gravity)

$$(+) \quad + \quad (-) \quad = \quad (+) \quad + \quad (-)$$

$$1\omega \qquad\qquad 2\omega \qquad\qquad (5)^{\frac{1}{2}}\omega \qquad (5)^{\frac{1}{2}}\omega$$
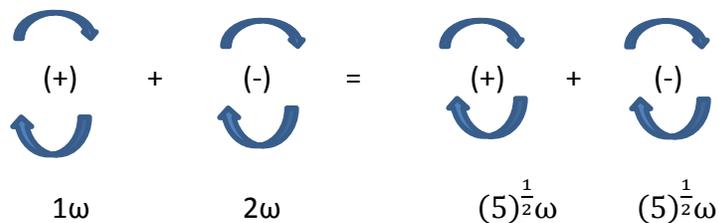
As time passed low speed collision of pairs would occur until either the density of the early universe dropped below a critical value of the clumping. This would be where the particles achieved the maximum radius due to the synchronized value of ω. In this model this value is the speed of light (c). These particles would be neutrons.

Movement of neutrons or other charged particles that were in close proximity to each other would results in torque being applied to the rotating neutron.

Under the correct balanced scenario an electron would be released. This would be due to the slightly larger radius of the electron. The released electron would orbit the positive nucleus. The orbiting electron would act as a stabilising spring. The electron could be forced either slightly forward or retarded from its normal orbital position.

(-) ↕ Relative to the rotation of the nucleus

This would allow time for the proton to accelerate/recede relative to its previous rotation due to the forces of moving particles close to its proximity.

All other progressions from hydrogen to heavier elements would proceed as defined in our current model.

Dark Matter

During nucleosynthesis, just as the most common type of element is hydrogen. The expected most common particles would be either positron electron pairs or a slightly larger more electrostatically neutral cube.

This less dense matter would tend to orbit, a denser core of matter. This significantly lighter matter would be easily ejected from the denser core with a small amount of solar wind.

If a photon were to collide with this neutral mass; most collisions would result in an exchange of positron electron paid. Much like Newton's cradle, the photons energy would be transferred through the neutral mass.

```
(+)    ⟶    (-)(+)         (+)(-)   ⟶    (-)
(-)         (+)(-)         (-)(+)        (+)

        Before                    After
```

There would also be expected a smaller percentage of deflections. This would be where the rotation of the neutral mass and the photon would not align. Although rare there would be some expected level of these, therefore slightly decrease in the perceived amount of light from distant objects.

```
(+)    ⟶    (+)(-)         (+)    ⟷    (+)(-)
(-)         (-)(+)         (-)         (-)(+)

        Before                    After
```

Dark Energy

This model as it stands; does not explain dark energy.

If the normalization of the photon's velocity is not linearly dependent on the absolute difference between the standard speed of light and the decreased velocity of a photon. Only then would it explain this phenomenon

More modelling of this is required to determine if this is a viable explanation. With this model any unaccounted red shift would be offset by a blue shift as the photon travelled toward our galaxy. This would result in a standard red shift.

The Photon

Based on this model a photon should have mass. The rotational nature of both gravity and photons would greatly decrease the attractive force when these rotations are not in phase.

The normalization of the velocity of a photon would occur when ever a photon interacted with the nucleus of an atom. The velocity of the photon would be reset to our value of light as the nucleus of the atom would be rotating at this velocity. Under normal densities of gas this change in velocity would approach zero. This is to say that the velocity of a photon is c relative to the velocity of the last collision with a nucleus. $v \propto c$ of the last baryon that the photon collided with.

Under this model, if a photon were traveling perpendicular to a large gravitational body, the photons path would bend toward that body.

This model would also predict either a red shift (away from) or a blue shift (toward), in a low-density environment, under the influence of gravity. This would allow the photon a sufficiently large enough path, without colliding with into a baryon, in order to alter its velocity.

In the Anderson paper on the pioneer anomaly, we see described as an apparent slowing down of the pioneer spacecraft. This slowing down was measured by a blue sift in the signal from the satellite. This is in direct agreement with the prediction with of this model.

The Anderson paper details the anomaly and subsequent paper by Turyshev indicating the origin of anomaly was thermal, have been reviewed. I refer to Paul Ten Boom's paper "The Pioneer Anomaly! An inconvenient Reality or Nasa's 12 year misconception. (add details from all three papers)

His arguments to the possibility that neither conclusion was final is more thorough than I would hope to duplicate.

References:

John D Anderson
        Study of Anomalous Acceleration of the Pioneer 10 and 11.

Slav G Turyshev
        Support for the thermal origin of the Pioneer Anomaly in light of new data

Paul Ten Boom
        Pioneer Anomaly: An inconvenient Reality or Nasa's 12 year misconception.

Conclusions

Based on this model there is only one primary force, the electric force. The gravitational wave is merely a component of the electric force. The strong force is just the binding energy of the electric force as it applies at the subatomic level. The weak force is the Roche limit of the unstable electron orbit. Magnetism is a wave caused by the displacement of electric charges due to the movement of free(unbound) electrons.

This model presents a greatly simplified quantum model. This simplicity of course becomes highly complex as we move from a simple hydrogen atom to more heavier elements.

The electron is a particle that orbits the nucleus and is also a component of the nucleus.

Relativity does exist, but only at the quantum level. There is quantum time and absolute time.

A positron electron collision would be a perfectly elastic collision resulting in the particles rebounding from each other. We could have an unbalanced positive triple colliding with an electron resulting in two photons being produced.

Future Directions

This initial paper lays out a very divergent picture of modern physics. It leaves much of the modeling and validation to be pursued prior to any definitive acceptance of this thesis as a new model of modern physic.