

Electromagnetism energy and space

Keep It Simple Stupid (KISS) – Ideas

REPLAY

For discussions from the nature's nature !
(<http://github.com/apotkonen/gt>)

Potkonen Ari

December 25, 2023

PREFACE

Personally I have been missing clear coupling and simplicity between electromagnetism and quantum mechanics modeling, which is now fuzzy area, overloaded with terms. Peoples have done lot of good work and existing models are usable for the practical life. Still there is need to go back in time and lift again obvious possible connection between electromagnetism and quantum physics on the table, if there is any possibility to get any clearance to our relativistic world. It's done with the lazy mathematician method: Guess the correct answer and let the others to proof that your and other historic proposals were right. Here correct answer is found with the simple "Duck test": "If it walks like a duck, looks like a duck, and quacks like a duck, it's a duck". In practice I state that there is only electromagnetism, energy and space in our relativistic world, nothing else, nothing less. Electromagnetism itself is kind of progressing phenomenon, supporting causality and offers for humans possibility to define time which is handy for modeling and tracking this causality, but time definition itself is also based to electromagnetism, energy and space, the major ingredients just proposed for our generally relativistic world. I really do not go to mathematic models, because then we overload ourselves and loose our target under mass of details. I try to explain needed change in our thinking in simplistic way, referring things we know from general relativity. Hopefully you'll get some ideas from here for your professional life!

Sincerely yours Ari Potkonen

Online: <http://github.com/apotkonen/gt>
<https://raw.githubusercontent.com/apotkonen/gt/main/general.pdf>

Editor: Not Named Yet
Author: Potkonen Ari
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Chapter 1

Guessing correct answer

1.1 Supposition

Our generally relativistic world we see consists only from electromagnetism, energy and space. Nothing else is there !

Electromagnetism itself is kind of progressing phenomenon, supporting causality and offers for humans possibility to define time, which is handy for modeling and tracking this causality, but time definition itself is based to electromagnetism, energy and space, the major ingredients what just proposed for our generally relativistic world.

1.2 Hypothesis

Hypothesis is that subatomic particles electron, positron, proton and antiproton are actually pure electromagnetic waveforms curled up in it's own space.

Schwinger limit (Julian Schwinger [8]) gives limits for electric field $E_c = 1.23 \text{ EV/m}$ (Eksa Volt / meter) and magnetic field $B_c = 4.41 \text{ GT}$ (Giga Tesla) after we can see nonlinearity in scale of electron Compton wavelength (Arthur Compton [2]) $\lambda_e = 2426 \text{ fm}$.

Strong electromagnetic fields in Compton wavelength scale ($\lambda = \frac{h}{mc}$) can produce discrete numerable curled waveforms ($\bar{\lambda} = \frac{\lambda}{2\pi}$), $\lambda_e = 386 \text{ fm}$, harmonics where wave goes with light speed, but from local observers perspective outside from curled space, human defined time seems to be stopped and we see kind of frozen representation from curled wave.

$$\hbar = \frac{6.582119569}{10^{16}} [\text{eVs}] = \frac{1.054571817}{10^{34}} [\text{Js}] \quad (1.1)$$

$$h = \frac{4.135667696}{10^{15}} \left[\frac{\text{eV}}{\text{Hz}} \right] = \frac{6.62607015}{10^{34}} \left[\frac{\text{J}}{\text{Hz}} \right] \quad (1.2)$$

$$m_e = \frac{E_e}{c^2} \quad (1.3)$$

Electron curled spacetime radius $\bar{\lambda}_e$ is

$$\bar{\lambda}_e = \frac{\hbar}{m_e c} = \frac{\hbar c}{E_e} = \frac{6.58 \text{ eVs} \cdot 299 \frac{\text{m}}{\text{s}}}{10^{13} \cdot 511 \text{ eV}} = 386 \text{ fm} \quad (1.4)$$

and diameter $\varnothing_e = 772 \text{ fm}$.

Electron annihilation released γ -photon wavelength λ_γ is

$$\lambda_\gamma = \frac{h}{m_e c} = \frac{hc}{E_e} = \frac{4.14eVs \cdot 299\frac{m}{s}}{10^{12} \cdot 511eV} = 2.436pm \quad (1.5)$$

There are few possibilities what has happened so that electron, positron could hold that electromagnetic wavelet – γ photon electromagnetic energy in after pair profuction; Either space is bending with light speed in curl so wave seems to be static or time, as we understand it, has been stopped because wave in curl curving proceeds with light speed or both because light speed is reached in formed curl. It's kind of total internal reflection forming standing wave having only one peak visible for externals and other peak is fully internal, only visible inside of curl. This bending makes curled wave behave like noticeable charged particle, still being a discrete standing wave due to nonlinearity making it possible to exist.

Curling can create discrete numbered relativistic bending forms to space, and we call known stable curl forms to electron, positron, proton and antiproton.

Each curl's bend space around and bending is called to gravity. Known lowest energy curls are electron and positron. Electron curl outside visible electric field is negative and other handed antiparticle positron has positive electric towards outside.

Because of this outside bended electric field, local observer can accelerate and move electrons and positrons using external electromagnetic field. When electron, it's curl is accelerated with the external electric field it will face relativistic Doppler effect it's wave is coming shorter which means that curled wave gains more energy and more mass. While decelerated curl wavelength widens and energy is lost to breaking against the external field.

Proton and antiproton next energy rich left and right hand sided electromagnetic field stable curls we know. Proton has positive field outwards and antiproton has negative field outwards. While energy is much bigger than electron has the wavelength of curl is shorter and curl size is smaller. Tight curl forms stronger bend to space and we see it as stronger gravity.

Electron negative electric field and proton positive electric field pull curls towards each other and those can superposition over the each other still maintaining own separate curls, proton smaller and electron bigger.

When curl and it's anticurl meet happens annihilation[1] where curl opens, gravity vanish and energy is again in electromagnetic form on local space. Pair production[7] can happen again from this released energy.

1.3 So called "weak interaction"

With the additional energy electron-curl $2426 fm$ [2] can reach proton-curl size $1.321 fm$ and form new harmonic curl called neutron $1.319 fm$. Due to needed extra energy neutron curl, even it's electric fields sum outside seem to be zero, is affected by external electric disturbances and cause neutron curl decay to proton and electron curl, average time to decay is about fifteen minutes.

This decay is called to beta β -decay to and acting force is called to weak force. Forces come during curl creation from electron Compton wavelength shortening taken energy – during size shrinking for electric field strengthening done work, and proton positive, electron negative electric fields mutual pulling force done work. These forces

and work amounts are opposite ones, partially cancel each other, causing sum force to look a like "weak force" or "weak interaction". Interaction begin and end state energy levels we can see from known rest masses whic directly relate to each separate or created harmonic curl energy at rest.

1.4 So called "strong interaction"

There is no strong interaction at all, seen strong interaction is relativistic electromagnetic interaction. For example proton - proton interaction is two different proton curls interaction, electromagnetic force pulls those away from each other starting from long distances. While curls come near by each other starting to form common harmonic curl, common relativistic space where both electromagnetic waves fly at light speed, and outside observer sees static view from curl having positive electric field towards outside observer. In this case repelling forces are so big that formed harmonic curl "Helium-2 (diproton)" isn't stable, and protons are immediately diverging apart. If we combine above in weak interaction told proton and electron combination called neutron with the proton we will get the stable "Hydrogen-2 (deuterium)" harmonic curl having one positive electric field towards outside observer, which easily form superposition with the additional electron curl.

Created harmonic curl has rest mass different from the ingredients rest masses and that is the needed or given energy during harmonic stable curl creation or it's breaking, those are the strong forces at common harmonic curl – atom core creation and breakage.

We should not use human defined term time here at all because in the

curl where field strength is so high that nonlinearity exists and affects to electromagnetic fields, forming space curling and related gravity. Electromagnetic forces reactions in nuclear scale can be defined just by comparing the ingredients and results rest masses. Differences are creating the dynamic forces driven reactive movements on reaction.

Because people are so keen to use their time definition to understand reactions we could give explanation using term time, so it might be helpful when reaching the matter how strong nuclear force could be just electromagnetic force and nothing else; When these separate waves are reaching near by, and they both are on nearby light speed in their own curls, coming together enough to form common curl they propagate at light speed, which means that relativistic electromagnetic force average affecting time, impulse time, shorter than what static observer can see, ... and understand ;-), therefore observer sees "strong interaction" because momentum is force multiplied with time, and now time is in its relativistic way $1/37[4]$ times shorter electromagnetic interaction than what observer thinks. This leads to situation where force has to be 37 times stronger than static local observer thinks to get if same effect happen in his local reference frame. User's reference frame where curled space internal time dilatation[9] is not seen.

And if change work get done, then later on uncurling also give that same bang backwards. Yep it's strong, but it's still electromagnetic force now forced to happen to item going with light speed at start state in its own curl.

This same process affects to all known more or less stable nuclides[5]. External conditions may vary, causing smaller or bigger probability for certain combinations forming.

$$\frac{1}{\gamma} = \sqrt{1 - \frac{v^2}{c^2}} ; \quad \gamma = 137.035999084 \quad (1.6)$$

$$\frac{v}{c} = \sqrt{1 - \frac{1}{\gamma^2}} = 0.99997 \quad (1.7)$$

Critical angle based to fine structure constant.

$$\theta_c = \arcsin\left(\frac{v}{c}\right) = 1.5631 \text{ rad } 89.556 \text{ deg} \quad (1.8)$$

By counting from speed difference how many internal reflections Nr_{min} are needed to cover full circle $2\pi \text{ rad} = 360 \text{ deg}$ we notice that about 406 reflections do the thing; Wave full internal reflection from minimum matter amount, one electron itself.

$$Nr_{min} \geq \frac{2\pi}{2 \arccos(\frac{v}{c})} = \frac{\pi}{\arccos(\frac{v}{c})} = 405.58 \quad (1.9)$$

This gives kind of hint what we are looking for. Truth is some kind of limit because formed electron or positron does not be full reflection instead it's showing either negative or positive electric field outwards, but not both. Kind of dot sized local space rotating so fast that light speed propagating wave from external observers perspective seems to stay still without energy loss or gain.

1.5 Superpositioning

Formed common curl – atom core – has positive electric field visible outside and it attracts electron curls to superpositioned position

balancing electric fields. Superpositioned electrons are relatively loosely connected and related to chemical properties of atom having core curl and superpositioned electrons.

Antimateria core curl have negative electric field visible outside and it attracts positron curls to superpositioned position balancing electric fields towards the outside local observer.

1.6 Tunneling

We do not live in isolation. Electromagnetic radiation in different waveforms, curls, harmonic curls, superpositioned curls and excitation levels in any local coordinate system having any speed level is still under radiation starting from thermal radiation towards high energy cosmic rays.

Electromagnetic waves can be summed up to sum wave and this holds over the space including the formed curls, harmonic curls and they excitation levels. Therefore some curls forming the barrier and others being trapped in can sum up with the external wave weakening barrier or strengthening the trapped curl so that summed curl can pass the barrier curls formed barrier.

1.7 Nuclear reactions

Radioactive decay is statistical value for the different curls, harmonic sum curls aka nucleus lifetime in the local reference frame under background radiation condition and referred material bulk own internal statistical state.

When there is external disturbance, background radiation and surrounding curls own curvature "gravity" and possible reaction pressure is affecting we see different reactions, changes to harmonic sum curls listed in nuclides chart[5], changes between the more or less stable harmonic waveforms in referred background environment.

Certain bulk material combinations can introduce chain reactions where initial curl breakage could introduce sub curls extraction and cause more curls to break in chain reaction aka fission.

Gravity and reaction pressure can also introduce and maintain existing curls merge or fusion to bigger harmonic curls in chain reaction way. Reactions can be exothermic releasing radiation and kinetic energy or endothermic by storing energy to created curl.

These defined reactions are reactions under one handed material bulks. Meaning other handed antimaterial curls participation to reactions is negligible.

1.8 Big Bang

Even material production is shown mostly be pair production creating 50% matter and another 50% of antimatter. Due to matter and antimatter annihilation process repeats several times before local cumulation occur. Withing existing local cumulations, probability that matter can stay longer intact grows. There will be places having more matter and other places having more antimatter. This way material probability survive longer grows. Any asymmetry in creation will boost cumulation significantly because there is no need to have huge distances between before massive cumulations can occur without risk to sudden annihilation due gravity merged local material and

antimaterial cumulations collision.

Due to expected amount of energy and mass of big bang ingredients must had, we could say that black holes are in some amount reversible or recursive. Because you can't have that amount mass, localized energy, without black hole formation before bang.

Most obvious explanation for the big bang is supermassive antimaterial and material back holes collision and expansion in combined black hole or expansion outside of combined black hole due the material annihilation in big way, same time opening each particle curl which remove gravity and electromagnetic radiation pressure overcome reduced gravity even pair production try to maintain it, in these circumstances immediate annihilation occur and radiation energy is free to enlarge space or even escape from black hole in form of big bang.

Other explanation is that material and antimaterial black holes merged by exploding blackhole internal structure we are part of. This leads to fractalistic structure of space.

1.9 Dark Matter

Space might be fractalish having space and blackholes in blackholes, then average density can be higher in inner space than what local observer can notice in near by environment, or there are unknown, unnoticed curl forms not affecting nor reacting with the known forms.

1.10 Geat Void

One explanation to great void formation in to space is an gigantic antimaterial mass passage through space, causing material annihilation. Interesting thing is could this passage formation be dated somehow, and does it have any relation to original big bang?

1.11 Accelerator physics

High energy accelerator physics has filled gaps from Live Chart of Nuclides [5], given lot of Feynmann diagrams[3].

Chapter 2

Mathematical formulation

The most needed gap fillings for Nuclides chart[5] are now done, and it's time to be able to understand fully local space of electron and positron. How space is curled and how electromagnetic γ -ray lives there according the Maxwell's equations in curved spacetime[6].

Dynamic process of electron-positron annihilation[1] opening the curls and releasing of γ -rays. Pair production[7] starting from "triplet production".

Continuing with the proton, antiproton, neutron, antineutron static representations without and with superpositioned electrons or positrons.

Then proceeding what happens on other collected Feynmann diagrams[3].

You are welcomed to continue this work and fill the missing.

2.1 Static electron and static positron

There is need to understand electron and positron local space curling, electric field in curled space and how this looks from remote static observer viewpoint. All in detail.

2.2 Annihilation

Original curls in detail, how waves summing at cross section of curls and how this leads to curl opening and γ -rays release.
Curved space "Gravity" behaviour during curl curvature opening.

2.3 Pair production

Incoming γ -ray wavelets. Curl creation in electron collision. Curl own space curvature development and from observers point static situation after that.

Formulation of discrete curl curvature form, and it's relation to gravity.

Chapter 3

Proof from formulation correctness

You are welcomed to write either theoretical proof, or model something we could measure nature and compare to calculations made based to formulation.

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General Theory Back Cover Abstract

Root question here is that do we understand spacetime curvature around energy concentration when energy is small and dimensions are small on subatomic and atomic scale.

This booklet breaks traditional method based description from the physics around as. Aim is have discussion, drop statistical methods for while for now and go back to the philosophy basics. Basic idea is well known from mathematics: Guess the correct answer and try to proof it to be true. In this booklet we really only lift the idea up, because others have done years and years work around these issues and we do not have solution yet.

Mostly what's done here is some proposal from reclassification of terms/items. Existing statistical method based theory verified by experiments, is not anyway wrong, but it's wide use prohibits, to ask meaningful questions. Or yes those have been asked, but not really seriously researched. Now I again lift these obvious questions and try to propose guessed, but obvious solution for accurate mathematical formulation. We need mathematical model capable to explain time dependent behavior on local coordinate system and how it transforms to lightspeed frame in subatomic, atomic scale. not just the statistical representation of it as now with existing models.

If exact mathematical solution is not found, we should have at least enough to model and find computational solution for the simplest examples we could think.

Initially we do initial assumption that all what we have is spacetime, electromagnetism and energy. Nothing else is there, even we have told to ourselves something else. Then we start to go through details case by case by thinking does it be possible and what it means in this particular case.