ID ZGV-2-01
Title Charge, Spin and the Formation of Particles
Stage 2-Micro-Scale 3-Space

Abstract

A start is made on electrodynamics (electricity and magnetism) by constructing functional models of charge and "bulk rotation" in 3-sea / volumetric space. These are needed to model gravity.

Assumptions

1. The manifold now contains many co-pressed motes; an ever-expanding compound bubble
2. Cooling has removed much of the linear KE, now represented as intense shock-waves
3. Motes now: vibrate, are very pressurised and inflate, limited by side-pressure of neighbours
4. Intense pressure and spin "hotspots" remain, both as extreme highs and lows
5. The usual Laws of Conservation of Energy (which we know) may be applied to ZGV.

Description

It is likely that this section will broach the 2-page per section rule the author has set himself. These are complex subjects to present; in particular magnetism.

We are preparing for a clear derivation of gravity in +g mode, from charge. Gravity in ZGV arises from charge-swapping between the electron and proton. To analyse these effects, we need to successfully model:

a) the nature of charge
b) the nature of "entrapped spin", leading to
c) the formation of particles.

This action occurs in the first abstraction layer in the ZGV model - the spacial 3-sea of motes, a "cohesive mass" pressed together by cooling (= relentless expansion). Cooling continues driven by inflation rescaling. Linear KE is represented in the main by shockwaves passing through the mass of motes, although some regions (especially the exterior) can move or expand preferentially as a group "outwards".

A topological digression: Wherever one stands in this model, all else must expand "away" (as mote 3-space is a bubble sat on the surface of an expanding 4D hypersphere). All "is expanding".

Within the bulk of the motes, co-pressing causes chaotic transfers of linear KE - which is in terms of linear movement very degraded; the chaos likely appears as shockwaves and vibrancy ("heat").

Addressing: Pressure and Spin (angular momentum).

Part of our knowledge of Conservation of Energy is that systems attempt to seek out lowest relative Potential Energy i.e. to "flatten" in terms of energy or pressure gradients. This is taken to apply to ZGV; to the 3-sea of motes it means that individual motes preferentially expand or move in the

"lowest energy" direction - so will take the easy path. Thus, a mote M which finds the neighbours to the right pressing less strongly then neighbours to the left - would cause M displace itself rightwards i.e. take the path of least resistance.

ZGV-R-01: motes take the path of least resistance i.e. flow from high pressure to low pressure.

By moving into a lower pressure region, a mote can expand this raise V by dropping P; this will tend to continue until the mote finds it shares the same pressure as its neighbours, at which point expansion slows to the local average.

ZGV-R-02: regions of motes "flatten pressure" i.e. spread energy of pressure so, on average, all motes possess the same pressure, forming a region of the same or "iso" pressure.

In ZGV, mote pressure is the driver of charge. The pressure difference we measure as "voltage" or "electro-motive force / emf". Motes moving from hi to low pressure trace out paths of motion known as the "electric field".

The flow (that is, charge) can be measured by bounding any region. Motes crossing the notional boundary (due to ZGV-R-01 and -02) per unit time is "charge".

This pressure difference is felt throughout the local 3-space; the flow of motes through the 3-space is analogous to the "displacement current" suggested by Maxwell (Note- do not confuse with flows of electrons or holes in conductors; we will meet these later).

In the early 3-space, still with vast chaos, regions of different "charge" (hi and low mote pressures) will occur spontaneously and randomly, driven by mote flows, shockwaves and residual bulk linear motion impacting regions randomly.

Some random regions will be co-located with "bulk spin" (mechanical rotation or circulation of entire groups of motes). Bulk spin speeds too vary from low to extreme (as well as spin direction).

Regions of bulk spin (circulating space) implies a "sheer or torque gradient" across any one mote.

For instance, if a section of space is static yet a neighbouring section has any motion, then a torque (sheer-pressure) and KE will exist across the space - given that each mote is trapped by peer pressure.

Motes experience this torque as yet another way of "binding PE" into them; always though they will seek the lowest energy gradient. In these terms, the lowest energy will be a "square" mote i.e. undistorted space. Binding Potential Energy into a mote (work) happens when motes get distorted.

Although it is not the right place to go into magnetism in detail, some highlights from later sections are worth presenting for they are soon involved:

a) torque-rotated (=diagonally skewed) space equates to magnetism / the magnetic field;
b) spin direction of "clockwise skew" - as the observer views it - equates to a North "pole";
c) co-spinning (thus same-skewed) space "sees" each other as "in-frame" i.e. considers each

other as “square” (lowest PE) space;

d) by mutually co-spinning (e.g. an N pole over an S pole) the “in-between”co-rotating space becomes fully square - the amount of PE bound drops. This space is less pressurised. The “pole” space moves into this as a region of lesser pressure - the effect equates to attraction;

e) when mutually counter-spinning, each rotating space experiences the other as having “higher PE” so will experience repulsion; any closer movement will increase torque in intermediate space / raise PE; to do this work has to be added.

More later on these magnetic subjects. But the net effect is clear:

ZGV-R-03: co-spinning mote space experiences attraction * Such space aggregates *

This, by itself, is no more then a region possessing intense curl (a magnetic field).

// a historical note - the story so far, although “of the author's invention” had already been formulated by the Maxwellians as a variant on the developing electromagnetic aether model. Fitzgerald though threw out the ideas in September 1878 for a “good” reason - turning on the point that even simple relativistic effects were not then understood, especially event horizons. This will soon become significant, for he discarded the a element forming gravity within electrodynamics.

Plus, for completeness:

ZGV-R-04: the familiar Law of Conservation of Angular Momentum applies to mote space i.e. velocities are a function of the radii / locus being rotated about (smaller radius > faster velocities)

* Regions of bulk circulating space may be involved with a random pressure high or low - at which point particle formation can occur.

Two scenarios present themselves - a sudden extreme underpressure about co-circling space, or the inverse - a sudden extreme overpressure. These both as random chaotic effects; a fairly rare occurrence, most likely driven by a combination of shockwaves and resonance effects.

A) The Underpressure Case

Mote space about the circling region moves chaotically “away / apart” forming a rip / tear, perhaps a “mini-Void” to form, ideally centrally.

If the case is:

i) that the Void is central and wide enough,
ii) that the circling mass of motes is “going quickly enough” i.e. has large angular momentum
iii) that the exterior space is still of high enough pressure on average

(and this will usually not be so - but sometimes) a vortex forms, centred on the Void.

Motes are driven by hi > lo pressure difference between external mote space vs. to the Void to move in to the Void, yet the immediate region is circulating. The effect is a “3-D” twister or water-spout.

In 2-D situation of which we are familiar, the system manifests as rotating material with a wide "mouth" circling the low-pressure node and a long trail extending into the high pressure region. In a 3-D situation, the simplest analogous system would be a similar structure with a co-orotating "twin" atop it, wide-mouth to wide-mouth.

Here now is the crux.

Later in this model - and well known to us at this level of reality - is found something called Special Relativity (SR). One of the tenants of this is that fast moving things distort and suffer "time dilation"; in ZGV motes find they cannot expand due to crowding-pressures on them, from motion.

Given high enough pressures, circulating speed and critical dynamics - it is considered in ZGV that a stable 3D vortex, with twinned top / bottom twisters of motes, can form about a mini-Void.

The inner-edge speeds of the motes in such a structure (for it to be stable) are likely fast. ZGV takes it that these speeds approach the relativistic.

A new phenomena appears - relativistic isolation of the inside vs. outside. This is a form of "event horizon", one in which in-falling motes suffer a tempo retardation as they attempt to inwardly move and circle the internal Void.

The term for this in ZGV is "spin wall". It is not a perfect a boundary; the real issue is that - from external views - near-inner edge motes take extreme times "forever" to fall into the Void - as they are in a tempo-slowed condition, seemingly forever circling about the central Void.

The structure still attracts motes, which become ingested and lost to the outside. Effectively, the vortex system perpetually "eats" motes i.e. consumes spacial volume.

The centripetal force offered by the Void, the speed of rotation, the dual-poles, the twisting action and the spin wall / event horizon all form a unique object. ZGV views this as - the electron.

Note that the rotating tails of the twinned vortices will "hunt" to find a termination with lowest PE (i.e. same-way spinning structure). The generic term for these is "torsion thread"; in ZGV, in this spinning space situation, the tails are "axial threads" - the forerunners of "Lines of Force".

B) The Overpressure Case

This is a logically-inverted twin to the Underpressure Case. Here, a circling mass of motes becomes vehemently compressed, causing a condition similar to (A) above but with the central body as a density of motes, not a paucity.

Once the driver to overpressure has passed, the central motes see the external world as lower pressure, thus try to flow out. The swirling nature of the system again circles the motes; the small sizes and extreme speeds again (with correct conditions) cause a spin wall to form.

This spin-wall is however "internal" to the structure; again it bounds the system and is an event horizon analogue. Note that this particle is made of three parts - an central spinning mass, a top vortex and a bottom vortex; the vortexes again being inverted and one atop the other.

Each of these have “mass” as they are composed of many motes.

About the spinning structure mote space is drag-rotated and external spin vortices form. Again, these have axial threads, also hunting to find lowest PE.

Note that the structure perpetually attempts to emit central motes.

The centrifugal force (pressure to escape) from the central mass, speed of rotation and spin wall / event horizon all form a unique object. ZGV views this as the proton, the “mote emitting” twin to the electron.

But there is one crucial difference. The proton is a collection of highly compressed motes, in vast numbers trapped behind a relativistic wall. The proton is thus a “time capsule” containing a section of the early Universe - it hold motes which are very dense, where P is “vast” and V approx. 0.

The proton spin-wall is to some degree porous; it leaks.

The proton slowly overpressurises local space, by emitting young, fast-growing motes from the “early Universe” sample trapped within. On release, these grow quickly overpressurising the region.

It is simple to show that both these effects (the spacial volume loss and overpressurisation) fall off with distance from the particles by an inverse square law.

A suggested formal method to derive the inverse square law for these is to consider a flow of “flux” (the transit lines of any flow or field) passing through a unit area drawn on a sphere, at different radii from the particle centre. This is a standard method.

The effects on intermediate mote space (i.e. some distance from the particles) are easy to figure out.

Motes are mechanically repelled from protons and are over-pressurised i.e. suffer a slowing of growth = tempo retardation.

Motes are mechanically attracted to electrons and are under-pressurised i.e. suffer a speeding of growth = tempo acceleration.

But before launching into that, the reader is encouraged to prove for themselves that the model here for charged particles duplicates these known charge effects:

a) protons and electrons mutually attract - rule ZGV-R-01
b) protons repel protons - rule ZGV-R-01
c) electrons repel electrons - rule ZGV-R-01 (a trap for the unwary: the electron is a name for a gap; we will consider this later. Consider the sea of motes, not the “gap”)

INSERT:
diagram of vortex
diagram of electron

diagram of proton

Pros and Cons

There is no proof that the simple particles are so constructed, although it is tempting to consider the three-part construction suggested for a proton - to be “quarks”.

Also, this model suggests that there are no such things are true “particles” - they would be composed of the same “material” as the surrounding 3-sea. Thus is illuminated the wave / particle debate (and tempts the author to suggest that the families of particles are no more then the families of splashes occurring on the “surface” of a 3-sea).

Antimatter has been deliberately omitted; it could be included by adding complexity. The author saw in the model (this will be discussed in following sections) that pressure or “tempo-displacing” particles could flip charge sign leaving the particle otherwise as-is. He later discovered that this is a standard approach known as CPT. This sort of discovery is a common occurrence when using ZGV; the Standard Model has often addressed identical issues.

Afterword

We stand close to gravity for our suggested particles can command flows of motes (i.e. flows of space) plus they are interfering with the local tempo / arrow of time.

The reader is still advised that the author was not driving the model in any particular direction; these are but the simplest way the author could present a complex situation (our Universe) and was not looking or trying to force a breakthrough - he was exploring.