

ID ZGV-1-02

Title The Starting Conditions: Motes and Conservation of Energy

Stage 1-Creation

### Abstract

The ZGV concept of a “mote” able to manifest and conserve all forms of “3-energy” is introduced.

### Assumptions

1. A real “something” embodies spacial 3-volume, setting size, causing separation of spacial points
2. This “something” is the agent possessing / carrying all other known incarnations of energy
3. These exist in great profusion in our Universe's manifold
4. These are indivisible spacial quanta
5. The Universe is expanding as if pressurised from within.

### Description

A means is invented to carry the plasticity, isotropy and homogeneity mentioned at the end of ZGV-1-01. The concept sprung from a method used to resolve “structure clashes” between data in computing. This was to address the following problems:

P-01: If our Universe is made of strings (as M-Theorists suggest) then why do we live in a Universe with only 3 dimensions - not 5, 6, 10, 11 or 26? (insert the latest number of dimensions supposedly enjoyed by strings)

P-02: It is seen that spacially, we have a 3-D Universe. Given that strings are individual with many dimensions and isolated - then why do we exist in the same 3-D? By default, strings have no means to communicate or agree which dimensions to exhibit. Different strings may choose different 3-D.

The solution suggested: insert a 3rd structure between the string and observed reality, bridging from the myriad, multi-dimensioned world of strings to our own Universe.

The structure envisioned was a “bubble” or “skin”; an isolation vehicle, enclosing each string. It would interface (i.e. adapt) the arbitrary realm of strings to a form to suit our manifold. It was suggested that this may be a property of our local manifold. As a result, each discrete “string-verse” was permitted (by some latent manifold property) to express only specific dimensions.

The term chosen for this structure was “mote”, one per string and of similar size (i.e. sub-Planck). An indivisible quanta of volume, the mote would have to incarnate / possess / express the known properties found at a point in our space.

As the mote is to us a 3-D object, the energies selected to express were:

- volume (=3-size)
- internal pressure
- linear motion of KE
- spin (rotation) in each of the 3 axis

a vibrancy or resonant oscillatory character.

By default, motes are of unit size (setting 3-size, they can be no other).

Yet motes are plastic; pressure situations many modify volumicity which locally will be regarded as “a unitary size of different properties” although motes of dissimilar size “see” the scale factor.

It is further assumed that the mote, in all interactions, will be conservative i.e. the energies of a mote are fixed unless traded and all trades are perfect - there are no overall losses. Any loss from one mote implies proportionate gains in others. This imposes a rule known as Conservation of Energy. A simple “gas law” to trade energy between pressure and volume ( $PV = \text{constant}$ ) was adopted to enforce Conservation of Energy for spacial volume.

#### Pros and Cons

This is a simple approach for a building-block for curving space; the basis of a “frame”. There is no proof of this.

Regarding Conservation of Energy. Although conservative systems of mathematics are well known and adopted as “Law” in physics, there is no rigorous proof that Creation has stopped or that it will never choose to “make a little adjustment” here or there.

Given that we know little of the true genesis of our Universe, it is possible that Creation continues in some form we cannot presently detect. Clearly, Conservation of Energy is imperfect - for we exist; Creation has happened at least once. Assuming that our Universe is indeed real and not a fiction held in some powerful imagination.

Fortunately, the author takes it that we exist, that Creation has stopped and that Conservation of Energy henceforth applies as a hard rule; this is both a conventional and simple stance.

#### Afterword

The “mote” at this point was a convenience; just an option, a potential way forward to explore our Universe. It was not thought special.