ISM Gravitation

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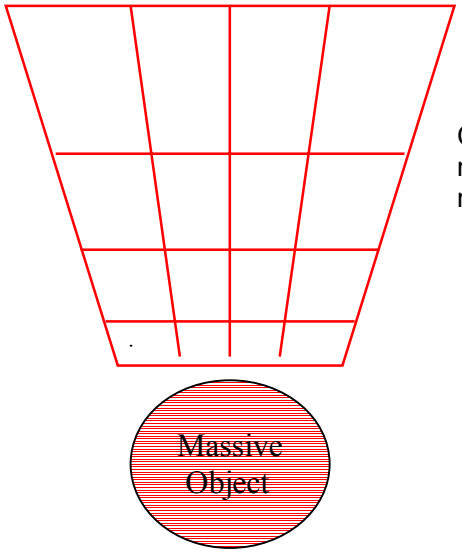
For all of its achievements, General Relativity remains a classical theory based on changes in geometry and stands separate from the other quantum forces of nature which propagate force through the exchange of virtual particles. Efforts to unify gravity with the other fundamental forces have been focused on String Theory, Loop Quantum Gravity and other variations and ideas that generally requiring the dimensionality of a point or other quantum effects at the Planck Scale. ISM gravity plays out in the three spatial dimensions by introducing the concept of a "time segment" with an orientation value of (X). The dimensionality of the time segment has been shown to have physical significance and represents a quantum entity. In the most fundamental sense of the term, ISM Gravitation represents a purely quantum theory of gravitation due to the perturbation of a background field from the emission of a fundamental quantum entity by a local gravitating mass.

Using IWPD Scale Metrics (ISM) the curvature of the 4-Vector Worldline – or, equivalently the 3 dimensional ISM coordinates – are determined by the interaction of a local mass with the total mass-energy of the universe. ISM suggests that all mass is in the process of decomposing to free space through the emission of a fundamental quantized entity (the "energime"). This suggests that the Background Energime Field (BEF), which is flat, is distorted near a massive object that alters the local concentration of free energimes; or, the Local Energime Field (LEF). The extent to which the BEF is altered is determined by the mass of the gravitating object as compared to the mass-energy of the universe.



Changing LEF due to perturbing effect of a massive object on the flat BEF as defined by the mass-energy of the universe.

This results in a condition that is essentially equivalent to the curvature of space and space-time in General Relativity. However, ISM suggests that this is equivalently and completely described by incorporating a time segment with an orientation value (X) plotted within the 3 spatial dimensions.

ISM gravity plays out on a two-dimensional space grid (2DSG) that represent the initial singularity from which the universe has evolved. The initial scaling factor applied to the grid was zero defining the initial singularity. With the passage of time, free energimes have been emitted resulting in a scaling factor that defines space as we experience it today. The 2DSG defines a flat BEF which may be perturbed by locally gravitating masses. The passage of time is equivalent to the magnitude of the time segment (or a time ring, if one chooses to apply a factor of pi). This time segment (or ring) is quantized and is responsible for defining the scaling factor required to convert the orthogonal relationships of the 4-Vector Worldline to the linear relationships utilized by ISM.

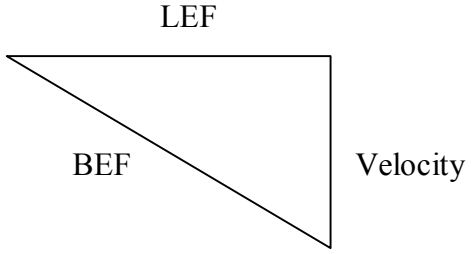
The impact of a gravitating mass at a given distance can be quantitatively expressed by:

$$LEF = \frac{BEF}{BEF + (a)\left(Mass \diagup Distance\right)}$$

Where *LEF* represents the value of the Local Energime Field relative to the BEF and (a) represents a proportionality constant that relates mass/distance to the BEF. The BEF is equal to the number of energimes per unit distance, which by definition is equal to unity. The value of (a) can be determined to be equal to the Gravitational Constant (G).

$$LEF = \frac{1}{1 + (G)\left(\frac{Mass}{Distance}\right)}$$

The "free fall" velocity of an object in a gravitational field is related to the BEF and the LEF through an orthogonal relationship



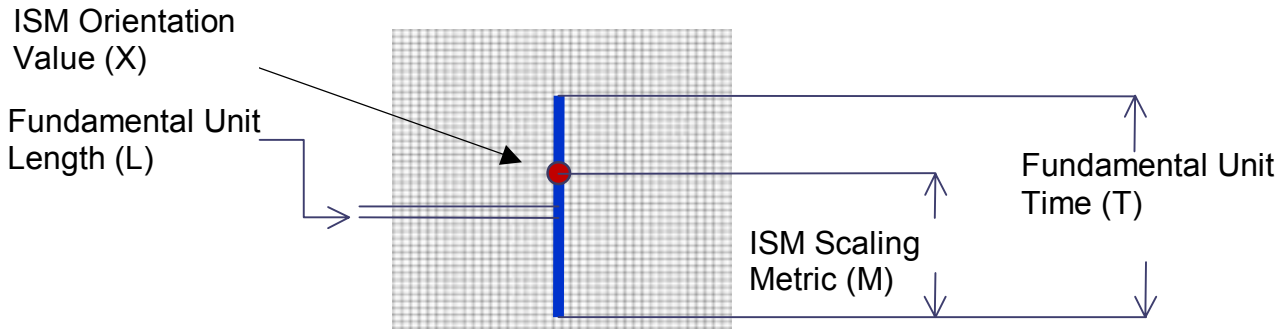
Solving for the free fall velocity yields:

$$v = \sqrt{1 - \left[\frac{1}{1 + GM/D}\right]^2}$$

However, this velocity can also be determined through a linear relationship between the BEF and LEF as follows:

$$v = (BEF - LEF)(ScalingFactor)$$

The required scaling factor has physical significance and is directly related to the value of the time segment and the orientation value (X) using ISM coordinates.



Scaling Factor = M/L

$$v = (BEF - LEF)\left(\frac{M}{L}\right)$$

ISM gravitation provides a quantum theory of gravity that successfully determines the free fall velocity of an object at any distance from a gravitating mass. The effects of a gravitating mass may be described using ISM coordinates or equivalently converted to a 4-Vector Worldline.

Evidence also suggests that ISM coordinates may be used to describe Quantum Electrodynamics as well as the Strong Nuclear Force suggesting a path for the unification of fundamental forces.