Why the Field Equation of General Relativity is compatible with the Aether

I demonstrate that the centre piece of General Relativity, the Einstein Field Equation, is completely compatible with the concept of an Aether type field, and that a simple rearrangement of the terms in that equation changes the meaning such that variable geometry space-time is removed and an energy field filling flat Euclidean space is described by the equation. Such a field will, by the very definition of the Field Equation, have the same observed (and verified) properties as that used by General Relativity.

In my earlier analysis [1] I showed how the various effects of Relativity, such as Length Contraction, Time Dilation and Mass Increase, can be explained by Classical Physics; and how the equations describing these effects can be tied back to an underlying field that fills space. This field acts as a sort of medium through which all Electromagnetic waves (such as light and matter waves) propagate, at a speed determined by the density of the energy in the field. The (local) speed of light and rate of time are thus slower in a higher density field.

Subsequent to that work, I discussed the "smoking-gun" evidence that a type of aether field exists [2] – contradicting the assertions of Special Relativity that the speed of light is isotropic in all inertial reference frames – in the one-way-speed-of-light measurements made from a number of experiments.

I then explained how such a space-filling medium can explain the observed orbital speeds, and asymmetry in those speeds, of stars in Galaxies; thus, removing the need to invoke an enormous amount of (still undetected) Dark Matter in Galaxies [3].

Now I will demonstrate that the centre piece of General Relativity, the Einstein Field Equation [4], is completely compatible with the concept of an Aether type field, and that a simple rearrangement of the terms in that equation changes the meaning such that variable geometry space-time is removed and an energy field filling flat Euclidean space is described by the equation. Such a field will, by the very definition of the Field Equation, have the same observed (and verified) properties as that used by General Relativity.

The key to this rearrangement is in the Einstein Constant [5]. This constant converts from terms expressing variable geometry space-time to that of a field with energy density (just like that I theorized about in my paper [1]).

The Einstein Field Equation can be expressed as:

$$G_{\mu v=}R_{\mu v} - \frac{1}{2}Rg_{\mu v} \tag{1}$$

Where:

$$G_{\mu v=}\frac{8\pi G}{c^4}T_{\mu v} \tag{2}$$

The constant $\frac{8\pi G}{c^4}$ is the Einstein Constant, which converts the stress–energy tensor $T_{\mu v}$ (which is in terms of energy density) into that of variable geometry space expressed by the $G_{\mu v}$ term.

By simply multiplying all terms that describe variable geometry space by $\frac{c^4}{8\pi G}$ (the inverse of the Einstein Constant), they are transformed into terms describing a field with a variable energy density (an Aether type of field).

So, one can define a new Tensor, the Energy Field Tensor:

$$E_{\mu v} = \frac{c^4}{8\pi G}\,G_{\mu v} \tag{3}$$

Then using Equations (2) and (3), Equation (2) is then simply:

$$E_{\mu v} = T_{\mu v} \tag{4}$$

Thus Equation (1) becomes:

$$E_{\mu v=}\frac{c^4}{8\pi G}\left(R_{\mu v} - \frac{1}{2}Rg_{\mu v}\right) \tag{5}$$

Similarly, new definitions for $R_{\mu v}$ and R can be made:

$$D_{\mu v} = \frac{c^4}{8\pi G}\,R_{\mu v} \tag{6}$$

$$D = \frac{c^4}{8\pi G}\,R \tag{7}$$

Then using these new definitions, a new form of the Einstein Field Equation can be written, with all terms describing fixed geometry space containing a field with variable energy density:

$$E_{\mu v=}D_{\mu v} - \frac{1}{2}Dg_{\mu v} \tag{8}$$

References

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