EINSTEIN FIELD EQUATIONS REVISITED

$G_{\mu\nu}$ is the Einstein curvature tensor which represents the geometry of spacetime. $T_{\mu\nu}$ is the energy-momentum tensor in spacetime. The Einstein field equations are given by $G_{\mu\nu} = CT_{\mu\nu}$ where C is a constant. The value of C is determined by comparison of Newtonian physics with the Einstein field equations.in the limit of small mass densities and low velocities. See references 1 and 2. As far as I know, this is the only determination of the constant C. C is assumed to be the same constant for all interactions.

The estimated energy and momentum associated with observable baryons, leptons, and bosons is too small to explain the structure of galaxies and the acceleration of the expansion of the universe. Possible solutions are:

1.Dark energy was postulated to explain the accelerated expansion of the universe. It only interacts through gravitation. Dark matter was postulated to explain the structure of galaxies. It also only interacts through gravity. C is assumed to be the same constant for all interactions.

2. The value of C is a different constant for different interactions. Thus the geometry of spacetime can be altered by different values of C. Dark energy and dark matter do not exist.

3. Dark energy and dark matter exist, and C is a different constant for different interactions. .

References

[1] Ronald Adler et al, *Introduction to General Relativity*, McGRAW-Hill, 1975, pp 345-347.

[2] Charles Misner et al, *Gravitation*, W.H.FREEMAN, 1973, pp 404-407.

Date: 07/20/22.