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A Theoretical Value for the Newton Gravitation Constant from the GEM Unification Theory of Gravity and Electro-Magnetism

The GEM(Gravity E&M) theory (Brandenburg 2007) is an alloy of the Sahkarov and Kaluza-Klein theories of EM and gravitation and allows the derivation of the Newton Gravitation Constant from first principles, and the two postulates of the GEM theory: 1. that gravity and EM forces, and electrons and protons are unified at the Planck length rP and split apart with the apprearance of a hidden fifth dimension. 2. That Gravity fields are an array of ExB drifts or pointing cells. Electron and protons are assumed to arise from the vacuum in a splitting of a lightlike interval into a timelike piece , (the electron) and spacelike piece ,(the proton,) with the three quarks corresponding to the three space dimensions. The first postulate allows the estimate the size of the new hidden dimension (esu units) ro =eˆ2/(mocˆ2) mo= (mpme) ˆ½ where mp and me are the proton and electron masses respectivelyand arrives at the formula
Ln (ro/rP) =(mp/me)ˆ1/2 =42.8503···which , when inverted becomes the formula
G= eˆ2/(mpme) alpha exp(-2(mp/me)1/2) = 6.668x 10ˆ -11 N-mˆ2/kgˆ2 This can be contrasted with the formula for G ˜ alphaˆ-1 exp (-Pi/4alpha) proposed by t'Hooft, (1989) derived from gravity models coexisting with thermal EM fields. Brandenburg, J. E. (2007) IEEE Trans.Plasma Sci. Vol. 35, No. 4. , p845. t'Hooft G. (1989) Nuc. Phys. B315 p517

Summary

The appearance of a Kaluza-Klein fifth dimension as a new degree of freedom in a 4-vacuum is postulated to allow the separate appearance of both EM and gravity fields and baryon and lepton number from the Planck scale, where they were before unified. A highy accurate formula for the Newton Gravitation constant G results(1 part per thousand) Gravity is postulated to exist as an array of ExB drifts or Poynting cells. A vacuum unstable to the production of charged particle pairs: protons and electrons,results, leading to continual inflation satisfying the Dirac large number hypothesis G˜1/Hubble Time. Brandenburg, J. E. (2007) IEEE Trans.Plasma Sci. Vol. 35, No. 4. , p845 and references therein.

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