42.8503... A Theory of the Unification of Gravitation and Electromagnetism

JOHN BRANDENBURG, Orbital Technologies Corporation — The GEM (Gravity Electro-Magnetism)(1), theory is presented as an alloy of Sakharov (2) and Kaluza-Klien approaches to field unification. The metric tensor becomes: $g_{ab} = 4(F_c^a F_{cb})/(F_{ab} F_{ab})$, where $F_{cb}$ is the EM field due to the ZPF (Zero Point Fluctuation). It is found that this results in a massless ground state vacuum. It is found that a flat-space metric is recovered in the limit of a full spectrum ZPF. The vacuum ZPF energy and vacuum quantities $G$, $h$, and $c$ give birth to particles quantities $m_p$, $m_e$, and $e$, in a process triggered by the appearance of the Kaluza-Klein fifth dimension. Where also, the EM and gravity forces split from each other in a process correlated to the splitting apart of protons and electrons. This leads to the formula $\ln(r_o/r_p) = \sigma = 42.8503...$, where $\sigma = (m_p/m_e)^{1/2}$, where $m_p$ and $m_e$ are the electron and proton masses respectively and where $r_o = e^2/m_o c^2$, $r_p$ is the Planck length, and where $m_o = (m_p m_e)^{1/2}$ and the formula: $G = (e^2/m_o^2) \exp(-2\sigma) = 6.668 \times 10^{-8}$ dynes-cm$^2$/g$^2$ (esu). The splitting of the electron and proton occurs as the splitting of a light-like space-time interval into a time-like part, the electron, and a space-like part, the proton, with three inseparable sub-dimensions, the quarks. (1) Brandenburg, J.E. (2007), IEEE Trans. On Plasma Sci., Vol. 35, No. 4., p845. (2) Sakharov A.D. Sov. Phys. Doklady 12, 1040, (1968).

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