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Relationship between the gravitational constant G and the fine structure constant, reduced Planck constant, light speed and mass of electron

Jun Qing Bi

University of Bern, Switzerland

A formula connecting the fundamental physical constants G (gravitational constant), α (fine structure constant), m_e (electron rest mass), \hbar (reduced Planck constant), c (speed of light in vacuum) and m_p/m_e (proton-electron mass ratio), and Earth's length of day and orbital period is deduced. The values of fundamental physical constants calculated from this formula match very well with the known values of said constants. Particularly, using CODATA's current recommended values for all fundamental physical constants, the calculated gravitational constant G is $6.67409325 \times [10]^{(-11)} [“kg”]^{(-1)} “m”^3 “s”^{(-2)}$ compared with the recommended value of $G = 6.67408 \times [10]^{(-11)} [“kg”]^{(-1)} “m”^3 “s”^{(-2)}$. The implication of this interconnection between these fundamental physical constants directly indicates that there is an underlying relationship between gravitational and electromagnetic scales which may have meaningful physical significance in the search for a unified theory.

Biography

Jun Qing Bi is currently working in the University of Bern, Switzerland; he has extended his valuable service in field of Space science for several years and has been a recipient of many award and grants. His international experience includes various programs, contributions and participation in different countries for diverse fields of study. His research interests reflect in his wide range of publications in various national and international journals.

Thomas@novobit.ch

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