The Electromagnetic Unit of Gravity

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Abstract

It is well known that dividing Faraday's constant by Avogadro number gives the elementary electric charge e. Here we will find that dividing the gravitational constant G by Avogadro number, gives the neutral electric charge which is a combination of the two sorts of it $(e^- + e^+)^2$, this suggests that $(2e)^2$ is the unit of gravity just as e is the unit of electricity and accordingly gravity in its deep nature is a neutral charge.

Keywords: Avogadro Number, fundamental charge, gravitational constant, hydrogen atom, Faraday's constant, Kepler's third law

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Introduction

Unifying gravity with electromagnetism was an old aim since Einstein and before him. As it is known, his unified field theory did not succeed in achieving this great aim. Now, obtaining the neutral basic charge from the gravitational constant through dividing it by Avogadro Number, suggests that gravity is nothing but a neutral electric charge consisting of its two "halves": the negative and positive. In this paper we aim to explain how and why the neutral charge $(2e)^2$ comes from dividing the gravitational constant G by Avogadro Number N_A.

Why $\frac{G}{N_A} = (2e)^2$?

With defining these terms, we are going to find the answer to this question on numerical and dimensional basis in the following:

$(e^- + e^+)^2$ is the basic circular motion in the universe

Any circular motion consists of two halves equal in magnitude and opposite in direction, simply without these two halves no circle can be formed, this is the case of hydrogen atom, the simplest and basic atom with a planetary form, where two charges equal in magnitude and opposite in direction create the circular motion of the electron, the lighter particle around the proton, the heavier one. Therefore $e^- + e^+$ or $2e$ explains the circular motion in this atom. To be sure of this as a fact, let us consider the Sun which is mostly a hydrogen star. It is formed as a whole from N_s = $1.19x10^{57}$ hydrogen atoms, where hydrogen atom is the basic unit of matter in the universe. Now multiplying the number of hydrogen atoms forming the sun by $(2e)^2$ gives the following

$$N_s(2e)^2 = 1.22x10^{20} \quad ^{(1)} \qquad [1]$$

But this is the squared orbital velocity of any solar planet V^2 which inversely proportional to its distance R from the Sun where Kepler's third law (2) describes this circular motion as follows

$$\frac{4\pi^2 R^3}{T^2} = V^2 R = 1.32x10^{20} \qquad [2]$$

This law is the accurate and practical one in the three laws of Kepler, where the term π without which the 3rd law cannot be correct, proves that the circle and not the ellipse with the simple and deep concept of the circle is the real geometry of the motion of solar planets.

Therefore from 1 & 2

$$V^2 R = N_s(2e)^2 \qquad [3]$$

The dimensions of e^2 as a circular motion will be shown later.

Eq. 3 proves that the circular motion in hydrogen atom caused by $(2e)^2$ is the basic motion of greater astronomical systems. Moreover, the hydrogen surface of the Sun is the chromosphere (3) above which the corona layer where electrons are free from protons in the plasma state. If an object is supposed to be at this hydrogen surface of the Sun, it will move with the velocity of an electron orbiting the proton at the fifth and last level of energy in hydrogen atom (4) (mostly after the fifth level the electron is free from the atom) , because the radius of the Sun is $6.95x10^8$ meter , then this object at the surface of the Sun will move with the following velocity

$$\frac{1.32x10^{20}}{6.95x10^8} = 1.91x10^{11}. \quad ^{(5)} \qquad [4]$$

The energy of electron at the fifth and last level of energy is $m_e v^2 = 1.73x10^{-19} J$ where v^2 has the mentioned value of [4], and this shows that the Sun itself behaves as a large hydrogen atom!

The gravitational constant G

It is the ratio between the squared orbital velocity V^2 which is determined by the distance from the central mass R, where $V^2 R$ (Kepler's third law) is a constant due to any gravitational system and M as the central mass of this system, we have the gravitational constant as follows

$$G = \frac{V^2 R}{M} = 6.67x10^{-11} \qquad [5]$$

Avogadro Number

This is one of the fundamental constant we accustomed to meet in chemistry and physics (6) , let us take it from being one mole of an ideal gas occupying 22.4 liters at STP, or it is the number of atoms in 12 grams of carbon 12 isotope, to be the ratio between the number of hydrogen atoms forming the central mass of a gravitational system and the central mass itself, let us prove this, for example, through dividing the number of hydrogen atoms forming the Sun by its mass in Kilograms

$$N_A = \frac{N_H}{M_S} = 5.97x10^{26} \qquad [6]$$

This calculation can be applied to any gravitational system like that of the Earth-Moon one.

From [5] and [6] we have

$$\frac{V^2 R}{N_H} = (2e)^2 \qquad [7]$$

This means that when constant $V^2 R$ of a gravitational system is divided by the number of hydrogen atoms forming the central mass of this system, this division gives the electromagnetic unit of gravity representing in the two sorts of fundamental charge $(e^- + e^+)^2$ or $(2e)^2$, again this proves that $(2e)^2$ is the basic unit of circular motion in the whole universe, Therefore hydrogen atom is not only the multiple of every substance in the universe, according to Prout's theory (7), but the circular motion of every gravitational system is a multiple of its $(2e)^2$

Therefore $$\frac{G}{N_A} = \frac{V^2 R}{N_H} = (2e)^2 \qquad [8]$$

In fact e^2 has the dimensions $\frac{L^3}{T^2}$ or $V^2 R$ as multiplying the proton, the central mass of hydrogen atom, by the gravitational constant gives

$$Gm_p = (2e)^2 \qquad [9]$$

The dimensions of L.H.S. are $\frac{L^3}{T^2}$

From Coulomb's law $$e^2 = m_e v^2 r 4\pi\varepsilon_0$$ [10]

Then for R.H.S. $$e^2 = \frac{ML^3}{T^2} \cdot \frac{e^2T^2}{ML^3}$$ [11]

And from [9] $$\frac{L^3}{T^2} = \frac{ML^3}{T^2} \cdot \frac{e^2T^2}{ML^3}$$ [12]

Where $$e^2 = \frac{L^3}{T^2}$$

Therefore, $(2e)^2$ has the numerical value and in the same time the dimensions of circular motion as the electromagnetic unit of gravity because $(2e)^2$ does not mean only v^2r in [10] but all the terms in e^2, and this is the deepest point in that gravity is simply a neutral charge.

Conclusion

The attraction between the positive and negative charges forms another shape of attraction called gravity which is therefore a neutral charge , this neutral charge $(2e)^2$ is revealed in this paper as the ratio between the gravitational constant G and Avogadro Number $\frac{G}{N_A}$ just as the electric charge e is the ratio between Faraday's constant and Avogadro Number, where $\frac{G}{N_A} = \frac{V^2R}{N_H}$ meaning that $(2e)^2$ is also the ratio between the squared orbital velocity determined by R in a gravitational system V^2R and the number of hydrogen atoms N_H forming the central mass of this system, where every atom shares by its small portion $(2e)^2$ in its whole circular motion.

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