Symmetrical electron from quark-like magnetic monopole

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In this article I propose a geometrical structure for a magnetic monopole constructed from Planck time, elementary charge -e, speed of light -c and the fine structure constant alpha. The frequency of the electron can be solved in terms of this monopole and time. As a monopole comprises a 1/3rd part of electron charge, it is analogous to the quark. The electron formulas suggest a Planck unit theory where the frequency of the Planck units mass and length are dictated by the frequency of the electron.

1 Introduction

A magnetic monopole is a hypothetical particle in particle physics that is a magnet with only one magnetic pole (a north pole without a south pole or vice-versa). In more technical terms, a magnetic monopole would have a net "magnetic charge". Modern interest in the concept stems from particle theories, notably the grand unified and superstring theories, which predict their existence. Magnetism in bar magnets and electromagnets does not arise from magnetic monopoles, and in fact there is no conclusive experimental evidence that magnetic monopoles exist at all in the universe.

The quantum theory of magnetic charge started with a paper by the physicist Paul A.M. Dirac in 1931. In this paper, Dirac showed that if any magnetic monopoles exist in the universe, then all electric charge in the universe must be quantized.

Further advances in theoretical particle physics, particularly developments in grand unified theories and quantum gravity have led to compelling arguments that monopoles do exist. Joseph Polchinski, a prominent string-theorist, has described the existence of monopoles as "one of the safest bets that one can make about physics not yet seen". These theories are not necessarily inconsistent with the experimental evidence. In some theoretical models, magnetic monopoles are unlikely to be observed, because they are too massive to be created in particle accelerators, and also too rare in the Universe to enter a particle detector with much probability [1].

Einstein proved that a magnetic field is the relativistic part of an electric field. This means that while an electric field acts between charges, a magnetic field acts between moving charges (as a charge moves through space more quickly and through time more slowly, its electromagnetic force becomes more magnetic and less electric). Therefore, the pole strength is the product of charge e and velocity c [2] or Ampere-length.

2 Magnetic monopole:

The ampere-meter (Ampere-Length) is the SI unit for pole strength (the product of charge -e and velocity -c) in a magnet.

$$\sigma_e = \frac{\pi^2}{3\alpha^2 AL} = \frac{2\pi^2}{3\alpha^2 ec} \tag{1}$$

3 Electron:

The electron frequency f_e (frequency of an electron at rest);

$$f_e = t_p(\sigma_e)^3 \tag{2}$$

Planck mass:

$$m_e = m_P f_e \tag{3}$$

Compton wavelength:

$$\lambda_e = \frac{2\pi l_p}{f_e} \tag{4}$$

Gravitation coupling constant:

$$\alpha_G = (\frac{m_e}{m_P})^2 = f_e^2 \tag{5}$$

para-positronium lifetime:

$$t_0 = \frac{\alpha^5}{\sigma_e^3}.\frac{t_p}{t_x} \tag{6}$$

ortho-positronium lifetime:

$$t_1 = \frac{9\pi\alpha^6}{4\sigma_e^3(\pi^2-9)}.\frac{t_p}{t_x} \tag{7}$$

4 Quark:

Traditional Quark theory suggests that the basic unit of charge is a 1/3th part of elementary charge 'e', such that;
Electron: -1
Proton: U + U + D = 2/3 + 2/3 – 1/3 = 1
Neutron: U + D + D = 2/3 – 1/3 – 1/3 = 0
A magnetic monopole analogue;

$U = \sigma_e^2$
$D = \sigma_e^{-1}$

5 Discussion

The magnetic monopole is a geometrical construct according to Planck units, as with the electron frequency formula. The parameters of the electron (electron mass and wavelength) are a function of the electron frequency whereby the electron dictates the frequency of the Planck units for mass and length. This suggests a Planck unit theory where wave-particle duality reflects an analog electron wavelength to digital electron mass oscillation. A dimensional analysis of these formulas is discussed in the article on the Mathematical Universe [4].

References

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4. A Mathematical Universe Hypothesis
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