THE DAON THEORY
Relations between matter and velocity

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Abstract

The **Daon theory** is a new general theory of physics, it is a completely new way to approach physics and includes, in principle, all phenomena of nature.

The theory is presented in a series of closely related papers treating Electromagnetism, Atomic physics, relativity, Particle physics, Gravitation and Cosmology. They should be red in this order for a complete understanding.

The explanation for the various natural phenomena are simple and logical. All the results from this theory agree, as far as we know, with experimental data.

In this document is presented an analysis of changes within an atom at high velocities.

It is strongly recommended to first read [1] and [2] of the Daon Theory for a complete understanding.

0.1 Introduction

We know that high velocity change the characteristics of all particles, but, we have not yet understood how it works. It is therefore necessary to examine the surrounding media (if such a thing exist) to be able to obtain a better understanding.

Chapter 1

The reference system

How is it possible that the law of Louise de Broglie ($mv\lambda = h$) is valid also at very low velocities. In this law, the velocity is relative to what? How is it possible that the wavelength vary with velocity in an empty space? If we examine a charge particle, in linear constant movement, its associated wave must be due to some transverse movement. If we now apply an electric field, in the direction of its velocity vector, the particle accelerate. But, such an acceleration can not act on the transverse movement! This means that the transverse oscillation should have the same constant frequency! It follows that the law of Louise de Broglie must be due to an interaction between the particle and a surrounding media. But, if a media exists, the velocity of a particle must be relative to such a media!?

The precision and development of diffraction measurements have significantly improved, in later years, we will take a closer look a the results from some diffraction experiments, which will allow us to make some important conclusion of the reference system surrounding us.

1.1 X-ray diffraction

The X-ray diffraction is interesting since this type of experiment gives a rather precise measure of the position of the atoms (molecules) in a crystal. The photon's velocity is so much higher than the difference of velocity between the earth and an eventual surrounding media. I.e., any such relative velocity can be neglected, considering the precision of the result obtained. We can therefore consider that the best results of the distance between atoms,

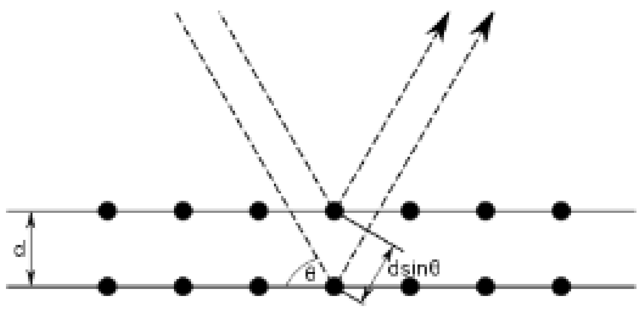

Figure 1.1: Scenario of Bragg reflexion (Lawrence Bragg and his father William Henry Bragg)

(molecules) in a crystal, are correct to at least an order of 10^-5.

1.2 Electron diffraction

We are interested of the Low Energy Electron Diffraction, since the velocity of the electron beam is in the same order, as an eventual relative velocity between the earth and the surrounding media. Two different fundamental equations are used in the analysis of the experiment; the law of Louise de Broglie $mv\lambda = h$ and Bragg's law (fig. 1.1) $n\lambda = 2d\sin\theta$, d is the distance between layers.

The picture obtained from such experiments are symmetric, as presented in figure 1.2, giving identical results, independent from position (direction) of the experimental apparatus or time of experiment. The electrons velocities are around $11\ 10^6\ \frac{m}{s}$, compared to the CMBR which is around $0.37\ 10^6 \frac{m}{s}$, i.e., if we believe that the electrons velocity should be relative to a media (ether), we would expect that such pictures should be asymmetric or irregular. This not the case!?

The conclusion must be that there is a local reference frame centred on the earth, i.e., some sort of neutral potential, following the earth in its movement through space.

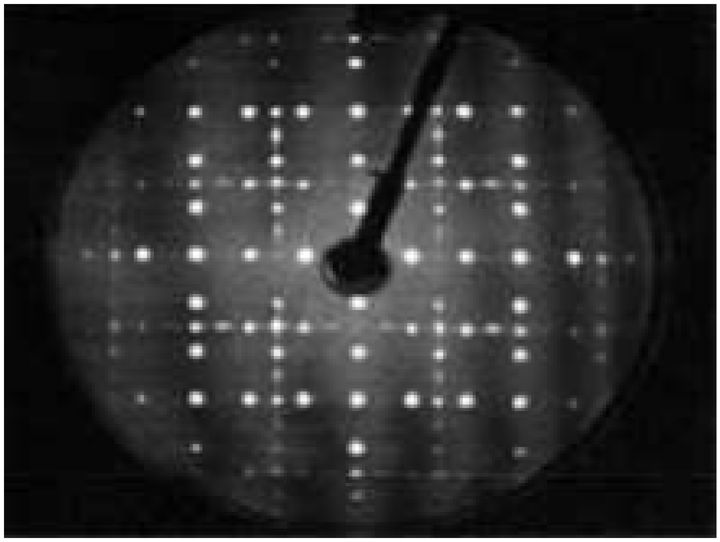

Figure 1.2: Experimental picture of LEED

1.3 Neutron diffraction

We can make a further step since neutron diffraction experiments use neutrons with much lower velocities then for electron diffraction (around $10^3 \frac{m}{s}$). As for the electron diffraction, there is no sign of any irregularities or asymmetries in the results. It follows, since the rotational velocity of the earth is around $0.5 \frac{km}{s}$, that also the rotational velocity of earth must be perfectly compensated, i.e., the local reference frame must follow the earth rotation, as well as, any other possible motion. The velocity of rotation of the free daons, can't follow the earth at bigger radius, since the interaction between free daons is insignificant in the azimuthal sense.

Chapter 2

Modification of an electron at high velocity

We will again examine the electron, since this is the most simple particle to treat.

The daons produce an electron when they are arranged in a regular spherical pattern, as presented in figure 2.1.

They must produce a radial equilibrium, to assure the stability of the electron. The daons are associated with the electron through their Order (electric field). Electricity and magnetism are then expressions of the collective behaviour of these daons[1].

The difference in the electro-magnetic phenomenon, due to the velocity, must depend on the difference in velocity between the center of the electron and the surrounding free daons. This difference is produced by the limited value of the signal velocity (c), it is therefore necessary that the shells adapt themselves to the action-reaction signal, coming from the internal shells versus the external and the signal coming from the external shells versus the internal ones.

An electron shell is a surface around the electron, where the daons Order is constant.

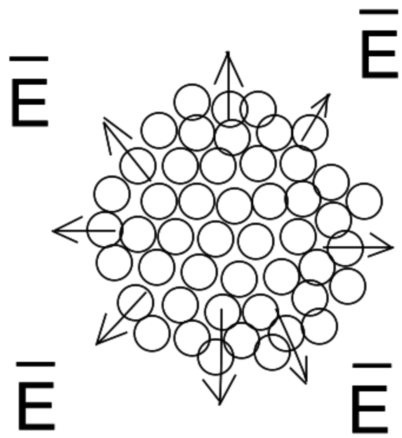

Figure 2.1: Schematic picture of a cut through the center of an electron

2.1 Compensation for the reduction of the electron's shell

Let us suppose that the electron has a velocity $\vec{v}$ relative to the surrounding "free daons" (i.e. daons being completely disordered). The daons will then orient themselves relative to the position of the electron at the moment it was sending its "signal of existence" (delayed potential). The geometrical situation of some shells of daons, reached at the same time by the "signal of existence" from the electron, is indicated in figure 2.2.

The distance between the electron's center and one of these spheres is

$$r = r_0(\sqrt{1 - \beta^2(1-O)^2 \sin^2\theta) - \beta(1-O)\cos\theta}) = r_0 f(\theta) \qquad (2.1)$$

$$\beta = \frac{v}{c}$$

Notice that the daons start to follow the electron in its movement, with increasing order.

We now examine the same delayed potential, but now starting from a sphere around the electron, ahead relative to the electron's center so that the signal from the sphere will reach the center at the same time. Such

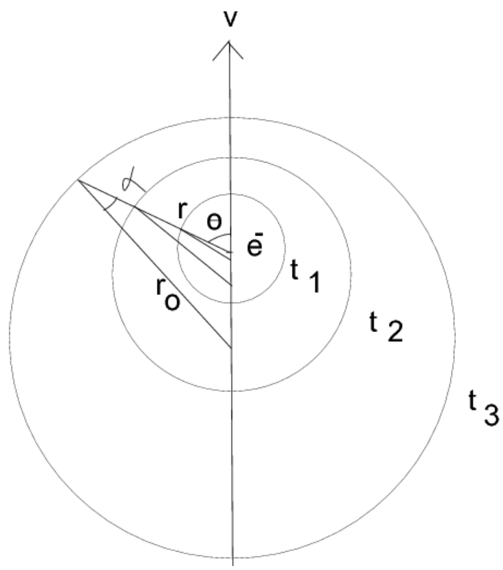

Figure 2.2: Spheres reached, at the same time, by the "delayed" signal coming from the electron's center

an arrangement will give the same equation (2.1) but now in the opposite direction i.e. $f(\pi - \theta)$.

We have[1] that the interaction between daons of different size is

$$a = \frac{3}{2} \frac{c^2}{\sqrt{r_d^- r_d^+}} \tag{2.2}$$

i.e. the interaction between daons with different size is their geometrical mean.

The geometrical mean difference in the signal path must therefore be, using equations (2.1) and (2.2)

$$r_m = r_0 \sqrt{f(\theta) f(\pi - \theta)} = r_0 \sqrt{1 - \beta^2 (1 - O)^2} \tag{2.3}$$

r_0 is a shell radius for an electron at zero velocity, relative to the surrounding free daons.

The electron's ordered daons must be positioned in a very precise order, to remain in equilibrium, it's therefore not possible to have a radial equilibrium, as indicated in equation (2.3), since here the daons would have a different radius relative to the free daons, when the Order becomes neglectible ($O \simeq 0$). It is therefore the external free daons which are deciding the size of the daons, throughout the electron. The equation (2.3) must be valid for any of the electron's shell. This then leads to a general reduction of size of the electron daons, but this can not be done in the outer shells, since the free daons always have the same size ($r_{d_{fd}}$), the electron must therefore create new shell in its external parts. This can be done by absorbing ordered daons from the electrical field which is accelerating it.

The electron's increased order make its daons contract so that the electron shrinks, but, the free daons, surrounding the electron, have always the same size and produce therefore always the same disorder. This phenomenon is exactly the same, as if we increased the free daon size to $r_{d_{fd}}\gamma$!

2.2 Mass increase

We calculate our electron's mass as follows ([1]; eq.(1-36))

$$m_e = m_d \int_0^\infty \frac{4\pi r^2}{\pi r_d^2} \frac{\pi}{2\sqrt{3}}\ O\ O \frac{dr}{\Delta r} = Const. \frac{r_{e_\infty}^3}{r_{d_{fd}}^3} \tag{2.4}$$

$\sqrt{\frac{8}{3}} r_d$ is the distance between two neighbouring shells, while the Order is $O = \frac{r_e^2}{r_e^2 + r^2}$.

We now use the EP-code to examined what happens to the electron mass, varying the size of the free daons (over a very wide range), while the daon mass is kept constant (system constant), the following law emerged,

$$\begin{aligned} \frac{r_{e_\infty}^3}{r_{d_{fd}}^4} &= \text{Constant} && (2.5) \\ \Rightarrow m_e &= K_e r_{d_{fd}} \\ \Rightarrow m_e &= m_{e_0}\gamma \qquad r >> r_{e_\infty} && (2.6) \end{aligned}$$

i.e. the free daon radius is directly proportional to the electron's **rest mass**. We also found that the graph of the radial equilibrium (r_e^2), the order (O) and the mass (see fig. 2.3), relative to the electron radius, keeps its shape, independent from the free daon size. And we found of coarse the law of Einstein[4]

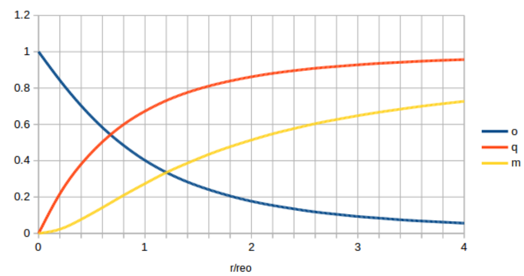

Figure 2.3: Graph of the main parameters of the electron

2.3 Deformation of an electron's shell

The delayed potential (see fig. (2.2)) has also another consequence, there is a difference in angle (α), of the rotational axis of the daons, between different shells defined as

$$\cos\alpha = \sqrt{1 - \beta^2(1-O)^2 \sin^2\theta} \tag{2.7}$$

The consequence of this difference is that the daons action between shells is reduced, this reduction has to be included in both directions, as presented in figure 2.4. This means that the radial force is reduced by a factor $\cos^2\alpha$, but, since the radial equilibrium must be maintained, this impose an increase of the radial force by a factor $\frac{1}{\cos^2\alpha}$. The size of the daons within an electron's shell is constant, the shell radius must therefore increase with a factor $\frac{1}{\cos\alpha}$, to maintain the constant order within each shell. This means that the form of the shells must be flattened out in the direction of velocity.

We obtain that the total deformation of a shell as

$$r = r_0 \frac{\sqrt{1-\beta^2}}{\sqrt{1-\beta^2\sin^2\theta}} \qquad r >> r_{e\infty} \tag{2.8}$$

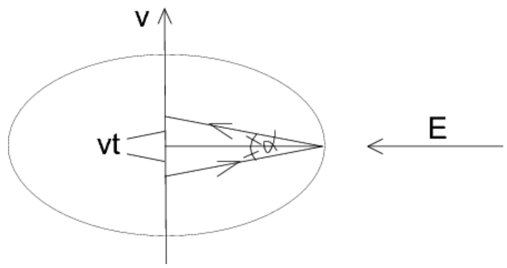

Figure 2.4: Geometry of the em-fields around an electron at constant velocity.

The electron's radial equilibrium remains always spherical, even when the shells, of constant order, are deformed. The discussion leading to the Einstein mass formula, is therefore still valid.

If we now examine the movement of the electrons, within an atom, we have already found[2] that the electrons must move on an equipotential surface. Such a surface is a shell around the nucleus with constant Order. There is no difference between the electromagnetic field around an electron or the EM-field around the nucleus. The equation (2.8) must therefore be valid also for the nucleus. It follows that modification of the electromagnetic field will act also between molecules and therefore all matter. We obtain therefore that all matter must follow the same law

$$l = l_0 \frac{\sqrt{1-\beta^2}}{\sqrt{1-\beta^2 \sin^2\theta}} \tag{2.9}$$

θ is the angle relative to the velocity vector.

2.4 Time dilatation

The velocity of an action signal will be modified in both directions, using equation (2.8), we obtain

$$t' = \frac{r}{cf(\theta)} + \frac{r}{cf(\theta+\pi)} = 2\frac{r_0}{c\sqrt{1-\beta^2(1-O)^2}} \qquad r >> r_{e_\infty} \tag{2.10}$$

i.e., we obtain a time dilatation[3] of

$$t = \frac{t_o}{\sqrt{1-\beta^2}} = t_o\gamma \qquad r >> r_{e_\infty} \tag{2.11}$$

2.5 Electromagnetic interaction at high velocity

We have now sufficient knowledge to analyse the EM-force acting between two charged particles. We start with expressing the force acting between two particles, where we consider the second particle to be the source, we obtain

$$\vec{F} = \frac{q1q2}{\sqrt{\gamma_1\gamma_2}}\vec{E} + q_1 \; \frac{v_1 \times \vec{B_2}}{\cos\alpha_1\cos\alpha_2}\cos\alpha_1\cos\alpha_2 \tag{2.12}$$

i.e., the strength of the E-field, of the electron is increased by a factor $\frac{1}{\cos^2\alpha}$ but the action of the external field, towards the electron, is reduced by the same factor, due to the inclination of the daons in the shells and the delayed potential from the external shells towards the electron center. The time delay of the signal reduce the electric action but not the magnetic one.

The potential energy between the two charges becomes

$$\vec{E}_p = \frac{q1q2\int_r^\infty \vec{E}}{\cos\alpha_1\cos\alpha_2} \tag{2.13}$$

The potential energy (masses) lost by the two charges, comes from the external part of their ordered daons (fields), i.e. there is here no effect from the time delay. There is also no correction from the signal coming from the external part versus the internal part. It follows that to ionize a "relativistic" particle you must also add the energy (mass) coming from the inclination of the daons within the shells.

We verified the equations (2.12) and (2.13), using the program ATOMOL; we examined the ion 197AU with only 1 and 2 electrons. We obtained, for their ground state, the energy 92.44 keV and 90.78 keV (exp.values 93.254 and 91.516 keV) respectively; the corresponding trajectories are presented in figures 2.5 and 2.6. The Hydrogen-like ion gives the interaction between a charge standing still (the nucleus) and a relativistic electron ($\gamma = 1.180$), while the Helium-like ion includes the interaction between the two relativistic electrons ($\gamma = 1.178$).

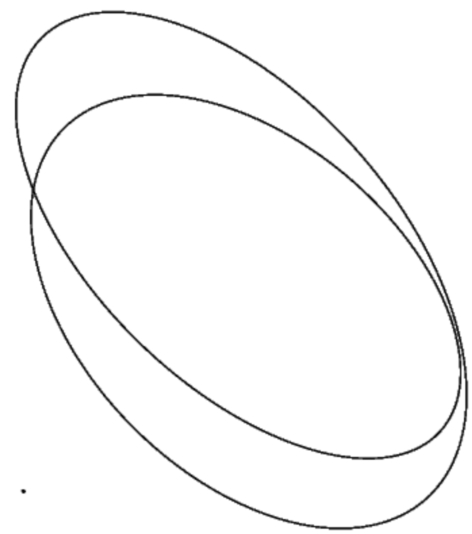

Figure 2.5: Trajectory of the Hydrogen-like 197AU

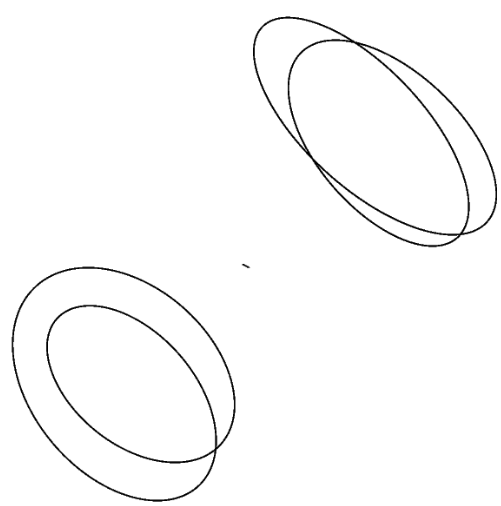

Figure 2.6: Trajectory of the Helium-like 197AU

2.6 Conclusion

We have shown that all major bodies in the Universe has a local reference system, which implies that they are surrounded by a neutral potential following them in their path through space. These potentials also follow their rotations and any other possible movement.

We give the explanations to the modifications of the electrons characteristics at high velocity ($v \simeq c$).

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