The Alternative Schrödinger's Equation

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Abstract. According to the unified theory[1,2] of dynamic space the inductive-inertial phenomenon[3] and its forces has been developed. These forces act on the electric units[4] of the dynamic space, forming the grouping[3] units (namely electric charges or forms of the electric field). So, by this inductive phenomenon and the phenomenon of motion[5] the wave function will be calculated. This wave function, which essentially interprets the phenomena of motion waves,[6] replaces the Schrödinger's equation.

Keywords: Inductive phenomenon; grouping units; wave function.

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1. Magnetic forces are Coulomb's electric ones

The magnetic forces are described as electric ones created by grouping units[3] of the moving electrons (Fig. 1), due to the inductive-inertial phenomenon.[3] If Q is a moving electric charge at speed u, while Q_1 is the respective electric charge of its grouping units, then it is obvious that

$$Q_1 = KQu, \tag{1}$$

where K is a ratio constant. We put in Eq. 1 the speed

$$u = u_a C_0, \tag{2}$$

where u_a is the respective timeless speed,[7] then

$$Q_1 = KQu_a C_0. \tag{3}$$

As u_a is dimensionless value then, due to Eq. 3, it should obviously apply

$$KC_0 = 1 \Rightarrow K = \frac{1}{C_0} \tag{4}$$

and so the Eq. 3 becomes

$$Q_1 = Qu_a \Rightarrow u_a = \frac{Q_1}{Q} \Rightarrow u_a^2 = \frac{Q_1^2}{Q^2}. \tag{5}$$

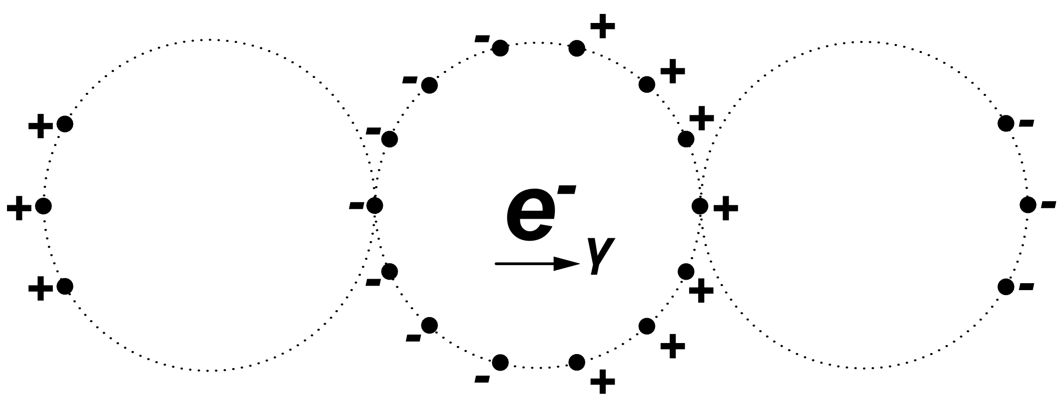

Figure 1. The grouping units and their first pair of reproduction extra grouping units

However, the timeless speed[7] has been found as a function of the pressure difference[6] ΔP on both sides of the formation of the first grouping unit and of the cohesive pressure[4] P_0, namely it is

$$u_a = \sqrt{\frac{\Delta P}{P_0}} \Rightarrow u_a^2 = \frac{\Delta P}{P_0}. \tag{6}$$

Therefore, due to Eqs 5 and 6, it is

$$u_a^2 = \frac{Q_1^2}{Q^2} = \frac{\Delta P}{P_0} \Rightarrow \Delta P = P_0 u_a^2. \tag{7}$$

2. The wave function replaces Schrödinger's equation

The time and spatial fluctuation of the spherical formation of the first grouping unit implies a harmonic change in the difference[6] ΔP of the cohesive pressure. Therefore, the first amplitude A_1 (Fig. 2) of the pressure fluctuation $\Delta P = P_0 u_a^2$ (Eq. 7) will be

$$A_1 = \frac{\Delta P}{2} = \frac{P_0}{2} u_a^2 \Rightarrow A_1 = \frac{P_0}{2} u_a^2 \tag{8}$$

and for $u_a^2 = Q_1^2/Q^2$ (Eq. 5), then Eq. 8 becomes

$$A_1 = \frac{P_0}{2} \cdot \frac{Q_1^2}{Q^2}. \tag{9}$$

The electric charge of the second grouping unit, due to Eq. 5, becomes

$$Q_2 = Q_1 u_a. \tag{10}$$

The fluctuation amplitude A_2 decreases, keeping in denominator the accelerated electric charge Q (Eq. 9) as the operative cause of the phenomenon, that is

$$A_2 = \frac{P_0}{2} \cdot \frac{Q_2^2}{Q^2}. \tag{11}$$

By replacing the electric charge $Q_2 = Q_1 u_a$ (Eq. 10) of the second grouping unit in Eq. 11, the fluctuation amplitude A_2 becomes

$$A_2 = \frac{P_0}{2} \cdot \frac{Q_2^2}{Q^2} = \frac{P_0}{2} \cdot \frac{Q_1^2}{Q^2} u_a^2 \Rightarrow A_2 == \frac{P_0}{2} \cdot \frac{Q_1^2}{Q^2} u_a^2. \tag{12}$$

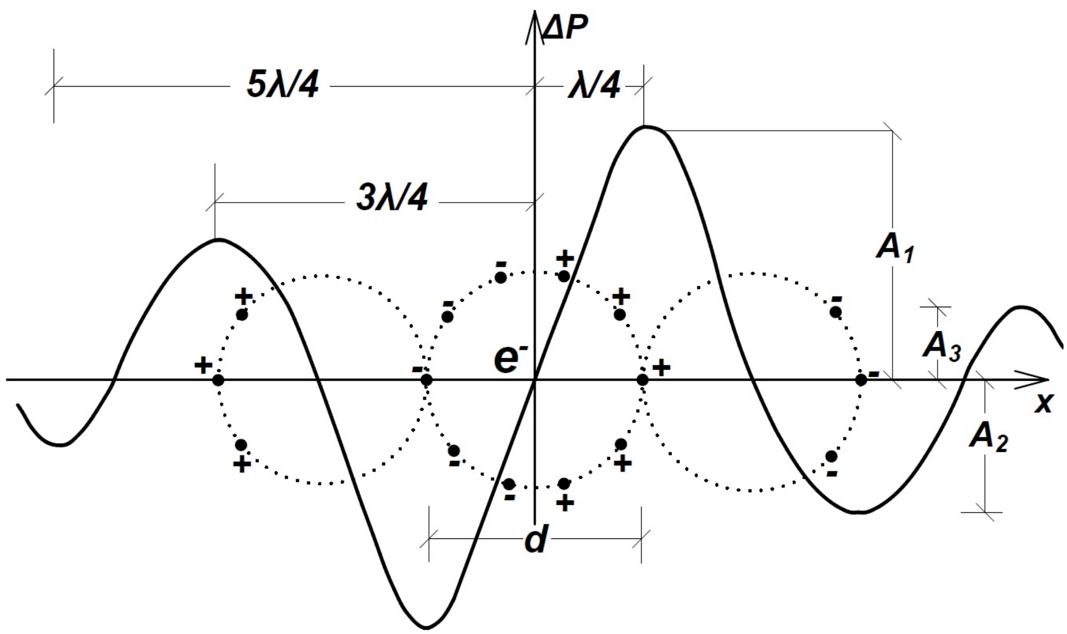

Figure 2. Descending change of pressure difference ΔP as motion arrow[6] of the electron with a motion formation diameter $d = \lambda/2$, where λ the wavelength of the harmonic fluctuation amplitude A of motion wave ($A_1 = P_0 u_a^2/2$, $A_2 = P_0 u_a^4/2$, $A_3 = P_0 u_a^6/2$, where $u_a < 1$ the timeless speed[7] of the electron)

However, due to Eq. 9, the Eq. 12 becomes

$$A_2 = A_1 u_a^2, \tag{13}$$

which results in

$$A_2 = A_1 u_a^2, A_3 = A_2 u_a^2, A_4 = A_3 u_a^2, ..., A_n = A_{n-1} u_a^2, \tag{14}$$

where A_n is the amplitude on either side of the formation and, due to Eq. 8, the Eq. 14 becomes

$$A_1 = \frac{P_0}{2} u_a^{2\cdot 1}, A_2 = \frac{P_0}{2} u_a^{2\cdot 2}, A_3 = \frac{P_0}{2} u_a^{2\cdot 3}, ..., A_n = \frac{P_0}{2} u_a^{2n}. \tag{15}$$

Therefore, we conclude that the fluctuation amplitude decreases with geometrical progress and more pronounced for low speeds, since the timeless speed[7] is $u_a < 1$. If $u_a = 1$ (the timeless speed of light[7]), Eq. 15 becomes

$$A_n = \frac{P_0}{2} = \frac{\Delta P}{2} \Rightarrow \Delta P = P_0, \tag{16}$$

that is, the E/M wave[8] uses the entire cohesive pressure[4] P_0 of constant amplitude, while its electric charge of grouping units are equivalent, since $Q_1 = Q u_a$ (Eq. 5) or in general $Q_n = Q_{n-1} u_a$ and for $u_a = 1$ it is $Q_n = Q_{n-1}$.

The wavelength of the formation (Fig. 2) is $\lambda = 2d$ and, of course, the first fluctuation amplitude of ΔP is $A_1 = P_0/2u_a^2$ (Eq. 8) observed at the ends of the half-wave $\lambda/2$. This fluctuation decreases by geometrical progress, as mentioned above.

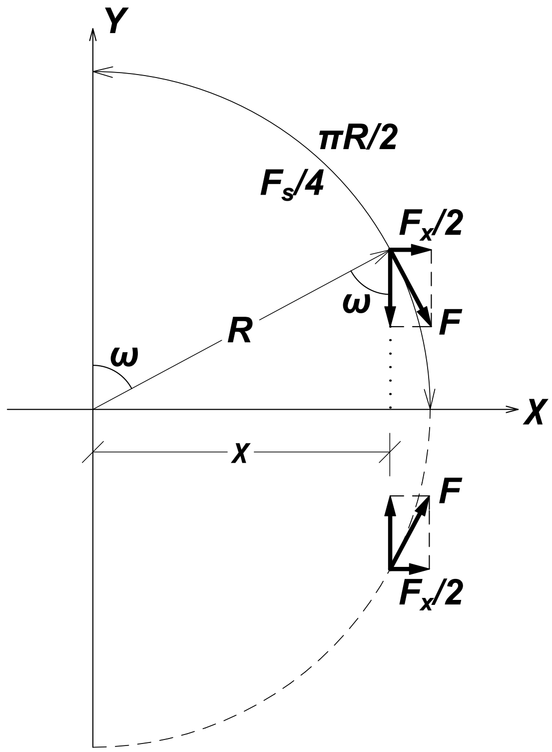

Figure 3. Horizontal component F_x of kinetic force[9] F causes a sinusoidal change in the pressure difference ΔP or the motion arrow[7] of the particle

The pressure difference ΔP is a sinusoidal function of the distance x from the particle. Fig. 3 shows that the horizontal component F_x of the kinetic force[9] F causes a sinusoidal change in the pressure difference ΔP or else in the motion arrow of the particle. Using the projection theorem (Fig. 3) we calculate the force $F_x = F_s/\pi \cdot sin\omega$ (Eq. 17) as follow:

The arc $2\pi R/4 = \pi R/2$ corresponds to an accumulated force[9] $F_s/4$ and the length x corresponds to a horizontal force $F_x/2$. So, for $x/R = sin\omega$, it is

$$x = \frac{\pi R}{2} \cdot \frac{F_x/2}{F_s/4} = \pi R \frac{F_x}{F_s} \Rightarrow F_x = \frac{F_s}{\pi} \cdot \frac{x}{R} = \frac{F_s}{\pi} sin\omega \tag{17}$$

as a sinusoidal function. The pressure difference ΔP, caused by the F_x vertical to the cross-section πR^2, becomes

$$\Delta P = \frac{F_x}{\pi R^2} = \frac{F_s}{\pi^2 R^2} \cdot \frac{x}{R} = \frac{F_s}{\pi^2 R^2} sin\omega \Rightarrow \Delta P = \frac{F_s}{\pi^2 R^2} sin\omega \tag{18}$$

and so, it is a sinusoidal function. So, the pressure difference ΔP can be written as

$$\Delta P = A sin\frac{2\pi x}{\lambda}, \tag{19}$$

where A the fluctuation amplitude of wavelength $\lambda = \lambda/2 + \lambda/2$ corresponding to the diameter $d = \lambda/2$ of the grouping unit (Fig. 2). By replacing the general equation of amplitude $A_n = P_0 u_a^{2n}/2$ (Eq. 15) in Eq. 19, the pressure difference ΔP becomes

$$\Delta P = \frac{P_0}{2} u_a^{2n} sin \frac{2\pi x}{\lambda}. \tag{20}$$

This wave function applies (Fig. 2) for

$$x = \frac{\lambda}{4}, \frac{3\lambda}{4}, \frac{5\lambda}{4}, ..., \frac{(2n-1)\lambda}{4}. \tag{21}$$

From the general equation $x = (2n-1)\lambda/4$ (Eq. 21) and for the absolute value of x it is found

$$n = \frac{2|x| + \lambda/2}{\lambda}. \tag{22}$$

Therefore, due to Eq. 22, the Eq. 20 becomes

$$\Delta P = \frac{P_0}{2} u_a^{\frac{4|x|+\lambda}{\lambda}} sin \frac{2\pi x}{\lambda}, \tag{23}$$

which for $|x| > \lambda/4$ decreases continuously.

This wave function, which essentially interprets the phenomena of motion waves, replaces Schrödinger's equation, where $-\lambda/4 < x < +\lambda/4$, $u_a = u/C_0$ the timeless speed[7] of the particle, u its time speed, C_0 the light speed, $\lambda = h/mu$ the so-called de Broglie's wave length,[6] h the Planck's constant,[10] m the mass[6] of the particle and P_0 the cohesive pressure[4] of space.

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