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THE PROOF OF HYPOTHESIS REGARDING DISTORTION OF TIME AND SPACE USING THE NUCLEAR FUSION MODEL

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Abstract. The study is dedicated to modern topic: the analysis of conditions that lead to distortion of the time and space coordinates which results from the general theory of relativity. The main goal of this research is to prove the hypothesis regarding distortion of time and space using nuclear fusion model. For this purpose the simulation instrument is used to imitate a moving proton that hits an electron of a hydrogen atom. The methodology of simulation is based upon calculation of the probabilities of elastic scattering and charge exchange of a proton with a target electron. The distortion is modeled by the functions that relate time and space logarithmically for distorted time and exponentially for distorted space. Such geometry construction is described by the Schrödinger equation using the electron wave function. Then the probability of charge exchange is calculated as the squared coefficient of this wave function in the negative side of the geometry that is divided by the sum of the squared coefficients of all the terms of the equation. Thus, the calculation result shows that the calculated probability of the charge exchange is high when the time and space are not distorted. However, when time and space are distorted it decreases, and the probability of elastic scattering is growing. The achieved result also indicates that the discrete energy levels of electrons in hydrogen atoms shift when the distortion of time and space occurs in the nuclear fusion.

Keywords: general theory of relativity, nuclear fusion, distortion of time and space, charge exchange.

INTRODUCTION

In our previous research [2–8], we have found that a rotating ultra-heavy mass that distorts time and space produces anti-gravity. Anti-gravity is another gravity that holds the opposite sign, + or –, of the physical properties (energy intensity and angular momentum) from those of normal gravity. Then we predicted that anti-gravity should expand the size of the Universe. In addition, we developed the concept of the flying craft having a disk-shaped body for interstellar travel. The explicit images of the ultra-heavy mass that distorts time and space are a black hole and a nuclear fusion reactor as they continue producing heavier nuclei by fusing the lighter nuclei such as hydrogen, deuteron and tritium. By our previous research we have so far completed the numeric simulation of a rotating ultra-

heavy mass by applying the general theory of relativity with the mathematics of the 4-dimensional tensors. However, the distortion of time and space is still an unproven hypothesis.

A research question remains: whether the nuclear fusion relates to the distortion of time and space, or not. To answer this question, we used an approximation method. First, we have prepared an input dataset that simulates the infinite 4-dimensional time and space, by replacing them with the finite discrete values. Then we set a geometrical placement of an electron in the field of two fixed protons with a separation in two-dimensional coordinates. With this setting, we calculated the probabilities of the proton's elastic scattering and its charge exchange by the approximation method of quantum mechanics [9, pp. 95–97]. The probability of charge exchange leads to the fusion of the proton and the hydrogen-atom. Also, we simulated the distortion of time and space by the same method of our previous research [2–8], which was based on the general theory of relativity [1 pp. 32–36]. Finally, by comparing the calculated probabilities with and without the distortion of time and space, we examined the relation between nuclear fusion and the distortion of time and space.

METHOD

Probabilities of charge exchange and elastic scattering by a moving proton

We have simulated a fusion of two hydrogen-atoms. But, to simplify the simulation, we calculated the probabilities of moving proton's charge exchange and its elastic scattering with a target electron of a hydrogen atom. (Note: the moving proton is called incident proton.) The reference [9, p. 95] sets a system of an electron in the field of fixed two protons. According to the reference, we set the following linear operator that is called Hamiltonian, considering the proton and the hydrogen atom as two interacting quantum mechanical system:

$$H = -\frac{1}{2}\nabla_r{}^2 - \frac{1}{\left|r-\frac{1}{2}R\right|} - \frac{1}{\left|r+\frac{1}{2}R\right|} + \frac{1}{R} - \frac{1}{M}\nabla_R{}^2 . \qquad (1)$$

It is an operator that forms Schrödinger's equation shown below with wave functions, $\varphi(r,R)$, and $X(R)$. It consists of five components. First, $-\frac{1}{2}\nabla_r{}^2$, is for the kinetic energy of electron where electron's mass is 1 in atomic units, and where $\nabla_r{}^2$ is an operator that makes $\left(\frac{\partial\varphi(r,R)}{\partial r}\right)^2$, and $\varphi(r,R)$ is a wave function of electron's coordinate *r* and proton's coordinate R. Second; $-\frac{1}{M}\nabla_R{}^2$ is for the kinetic energy of the moving proton and ∇_R^2 is an operator that makes $\left(\frac{\partial X(R)}{\partial R}\right)^2$, where $X(R)$ is a wave function of the proton coordinate R. M is the mass of the proton. (Note: $M\nabla_R X(R)$ is the momentum p of a proton, and $p^2/2M$ is the kinetic energy of a proton; then $\frac{[\nabla_R X(R)]^2}{M}$ is the total kinetic energy of two protons.) The other three terms of (1) are for the potential energies:

1) potential energy of hydrogen atom with the target electron in its initial position

$$-\frac{1}{\left|r-\frac{1}{2}R\right|};$$

2) potential energy of hydrogen atom with its electron after charge exchange

$$-\frac{1}{\left|r+\frac{1}{2}R\right|};$$

3) potential energy of hydrogen's proton

$$+\frac{1}{R}.$$

The potential energy of the target electron 1) induces the proton's elastic scattering, and the potential energy of the target electron 2) induces its charge exchange with the incident proton. The proton's potential energy 3) induces both elastic scattering and charge exchange of the slowly moving incident proton.

Because the proton is moving slower than the hydrogen atom's electron, $-\frac{1}{M}\nabla_R{}^2$, is called the slow subsystem H_2 of the Hamiltonian, and $-\frac{1}{2}\nabla_r{}^2-\frac{1}{\left|r-\frac{1}{2}R\right|}-\frac{1}{\left|r+\frac{1}{2}R\right|}+\frac{1}{R}$, is called the fast subsystem H_1 of the Hamiltonian. Then (1) becomes as follows:

$$H=H_1+H_2.$$

Here H_1 plays the role of potential energy while H_2 plays the role of kinetic energy in the Hamiltonian (1). Then the following Schrödinger's equation gives the solution of the problem:

$$H\varphi_n(r,R)X(R)=\left(-\frac{1}{2}\nabla_r{}^2-\frac{1}{\left|r-\frac{1}{2}R\right|}-\frac{1}{\left|r+\frac{1}{2}R\right|}+\frac{1}{R}-\frac{1}{M}\nabla_R{}^2\right)\varphi_n(r,R)X(R)=$$

$$=(H_1+H_2)\varphi_n(r,R)X(R)=E_n\varphi_n(r,R)X(R).$$

Henceforward we focus on the potential energy H_1 of Schrödinger's equation:

$$H_1\varphi_n(r,R)X(R)=\left(-\frac{1}{2}\nabla_r{}^2-\frac{1}{\left|r-\frac{1}{2}R\right|}-\frac{1}{\left|r+\frac{1}{2}R\right|}+\frac{1}{R}\right)\varphi_n(r,R)X(R)=$$

$$=H_1\varphi_n(r,R)X(R)=\varepsilon_n\varphi_n(r,R)X(R), \qquad (2)$$

where $\varphi_n(r,R)$ $X(R)$ is the solution known as a wave function and ε_n is the eigenvalue of the potential energy. The wave functions are continuous, but the equation (2) leads to the discrete eigenvalues that define the energy states of the hydrogen atom as the suffix *n* gives discrete numbers, 0, 1, 2…, that define the discrete energy states of the hydrogen atom with an electron. Hence, the hydrogen-atom has a discrete energy spectrum in its atomic structure, while the slowly moving proton has a continuous energy spectrum.

Then the coefficients of the Schrödinger equation are calculated as solution of the problem of an electron in the field of two fixed protons with separation (distance) of R, as shown in Fig. 1 in a flat $x-y$ coordinate system. Here, r gives the distance between the origin O of the coordinates and an electron, which is indicated in the plane polar coordinates. Here, $(1/2)R$, and $-(1/2)R$ are the locations of two protons on the x-axis; and, $r-(1/2)R$ is the length of the vector between the proton located at $(1/2)R$ and the electron, and $r+(1/2)R$ is the length of the vector between the proton located at $-(1/2)R$ and the electron, indicated in plane polar coordinates.

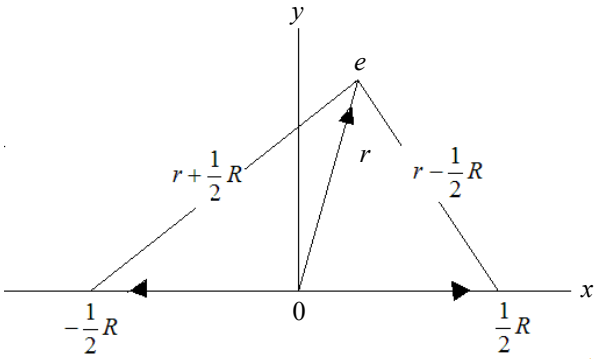

Fig. 1. Coordinates of two protons and an electron (modified from [9], p. 89, Fig. 21)

The Hamiltonian (1) is symmetric $(r \to -r)$ with respect to interchange of the incident particle (a slowly moving proton) and target particle (an electron of the hydrogen-atom). Here, the interchange of the particles means that the proton's $+$ charge changes to –. Then symmetric and anti-symmetric functions $\varphi_n^S(r,R)$ and $\varphi_n^a(r,R)$ are introduced. When the nucleons are far apart, the electron will be localized near one or the other proton, therefore we have:

$$\Phi_n^{S.a}(r,R)\underset{R\to\infty}{\longrightarrow}\frac{1}{\sqrt{2}}\left[\Phi_{n_0}^{Q}\left(r-\frac{1}{2}R\right)\pm\Phi_{n_0}^{Q}\left(r+\frac{1}{2}R\right)\right], \qquad (3)$$

where $\frac{1}{\sqrt{2}}\left[\Phi_{n_0}^{Q}\left(r-\frac{1}{2}R\right)\pm\Phi_{n_0}^{Q}\left(r+\frac{1}{2}R\right)\right]$ are hydrogen-atom's wave functions [8, p. 96].

The initial condition of the simulation is that the electron is attached to the proton at $+R/2$ of *x*-coordinates. It means that the wave function of the electron is initially:

$$\Phi = \Phi_{n_0}^{Q}\left(r - \frac{1}{2}R\right). \tag{4}$$

Here, $\Phi_n^Q(r-1/2R)$ means that φ_n^Q is a function of $r-1/2R$, that is the initial position of the electron, which is located at a distance from the coordinate $+1/2R$ to the electron *e* in the upper-right hand of Fig. 1. Here n_0 means the electron's initial state among its n energy states (4).

The uncertainty principle of quantum mechanics doesn't determine the exact position of an electron in a hydrogen-atom, but it only calculates the probability of the electron's position as the squared coefficients of Schrödinger's equation (2) that describes the system of the proton and the hydrogen-atom. Then in (2), the coefficient of $\Phi(r-1/2R)$ is for the proton's elastic scattering, and the coefficient of $\Phi(r-1/2R)$ is for the charge exchange (the capture of the proton by the hydrogen-atom). In this simulation, an electron's position is somewhere between two symmetrically placed hydrogen atoms, while their protons' positions are fixed at the $+1/2R$, and $-1/2R$ on the *x*-axis. Then these two protons are set in Fig. 1 to calculate the coefficients of a slowly moving proton and a hydrogen-atom of Schrödinger equation (2).

First, the position of the electron is at $+1/2R$ of *x*-coordinates in Fig. 1. It means the elastic scattering of the slowly moving proton because the electron of Fig. 1 stays at the electron's initial position with the hydrogen-atom's proton that is fixed at $+1/2R$. On the other hand, the move of the position of the hydrogen-atom's electron from $+1/2R$ to $-1/2R$ means the charge exchange (the hydrogen-atom's electron changes its sign from + to –) by the interaction between the slowly moving proton and the hydrogen-atom's electron [9, p. 84].

Therefore, the coefficient of $-\dfrac{1}{\left|r-\frac{1}{2}R\right|}\varphi_n(r,R)$ of (2) gives the amplitude of the elastic scattering of the proton; and, the coefficient of $-\dfrac{1}{\left|r+\frac{1}{2}R\right|}\varphi_n(r,R)$ gives the amplitude of the charge exchange. The coefficient of $+R/2$ gives the amplitude of both of the elastic scattering and the charge exchange to be made by the hydrogen atom's proton.

INPUT DATA FOR THE NUMERIC SIMULATION

If time and space are distorted (dependent on each other), the electron's plane polar coordinate r *must be* dependent on time. However, it contradicts the uncertainty principle of quantum mechanics because the location of the electron cannot be determined at any time by the principle. Then for the purpose of our numeric simulation, we compromise this contradiction by defining the kinetic energy as a constant term. The hydrogen-atom's electron may change its position from its initial position at $+1/2R$ of *x*-coordinates, to the position of the charge exchange, $-1/2R$, but the simulation doesn't calculate when it occurs, but only the probabilities of the occurrence.

Then we assigned 24 discrete values for the coordinates of r and R as shown in Fig. 2.

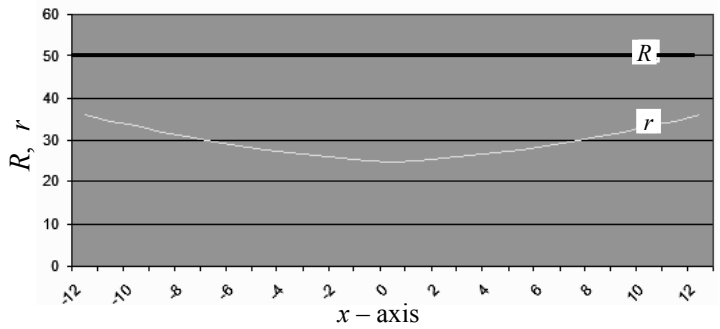

Fig. 2. Coordinates *r* and *R* without the distortion of time and space

In our simulation, symmetric and anti-symmetric functions $\varphi_n^S(r,R)$ and $\varphi_n^a(r,R)$ are substituted by the symmetric geometry of two hydrogen atoms as the mirror images on the both-sides of the origin O, as shown in Fig. 3. We assign the value of R by the empirically measured radius, 25 pico-meters, of hydrogen-atom [10]. Because two hydrogen-atoms are placed next to each other in Fig. 3, we assign 50 to the value of R. If charge exchange happens, the electron's plane polar coordinate, r, changes its position from the initial position, $+R/2$ of x-coordinates, to the position of the charge exchange, $-1/2R$. Then the relation between r and R is as follows:

$$r = \sqrt{\left(\frac{R}{2}\right)^2 + x^2}\ , \tag{5}$$

where x is the distance from the origin O toward $-1/2R$ and toward $+1/2R$, and the origin O is at 0 on the x-axis, $-1/2R$ is at -12 on the x-axis; and, $+1/2R$ is at +12 on the x-axis. The electron is initially attached to the proton at $+1/2R$ of x-coordinates (5); and then it will be attached to the proton at $-1/2R$ of x-coordinates after the charge exchange.

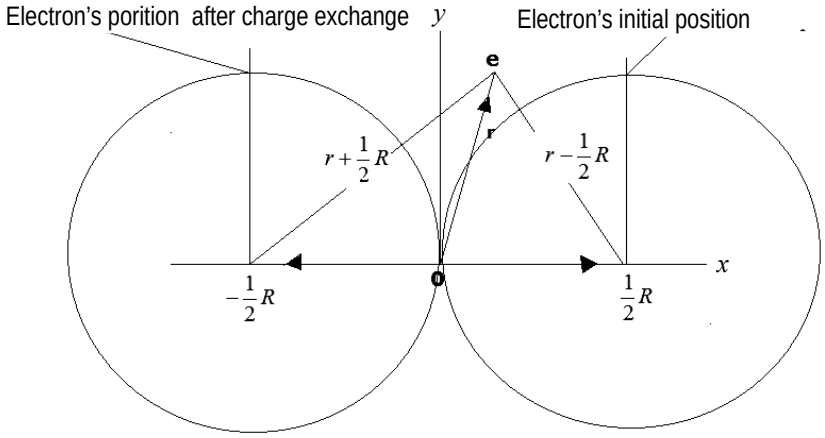

Fig. 3. Position of the electron and its coordinate *r*

As stated by (3), the nucleons are far apart; therefore, the electron will be localized near one or the other proton. However, it doesn't mean that R in this simulation should be far apart to infinity, but it only justifies the wave functions of hydrogen-atom that distinguish the initial state of the wave function $\Phi_{n_0}^{Q}\left(r-\frac{1}{2}R\right)$ and the wave function $\Phi_{n_0}^{Q}\left(r+\frac{1}{2}R\right)$ after the charge exchange.

Then we set sine curves as the wave functions $\varphi_n(r,R)$ of (2). And we set two frequencies, w_1 and w_2 as shown in Fig. 4, for simulating the lower energy state (the lower frequency) and the higher energy state (the higher frequency) of the electron of the hydrogen atom. These sine curves are the functions of r and R, which $\varphi_n(r,R)$ require.

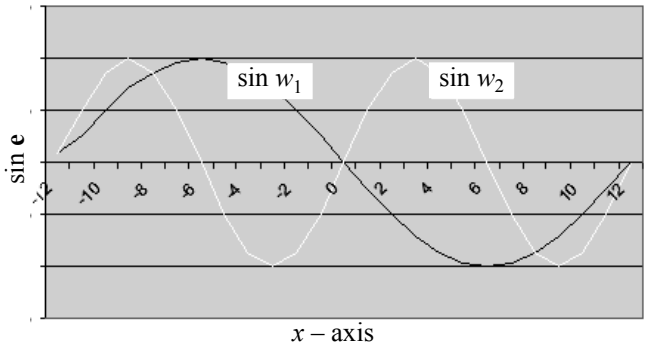

Fig. 4. Sine curves with lower frequency w_1 and the higher frequency w_2

If r and R are dependent on t, r becomes distorted distance ρ, while t becomes distorted time τ as shown in Fig. 5 and Fig. 6. In Fig. 2 shown above, r and R are distance without the distortion. However, in Fig. 5 and Fig. 6, τ and ρ are time and distance showing the interaction with each other. They are calculated by:

$$\tau = t + f(r); \tag{6}$$

$$\rho = t + g(r), \tag{7}$$

where, $f(r)$ and $g(r)$ are given functions of r [9 p. 34]. We set them as shown below, logarithmic distortion, and with exponential distortion:

$$f(r) = \log r,$$

$$g(r) = e^{r}.$$

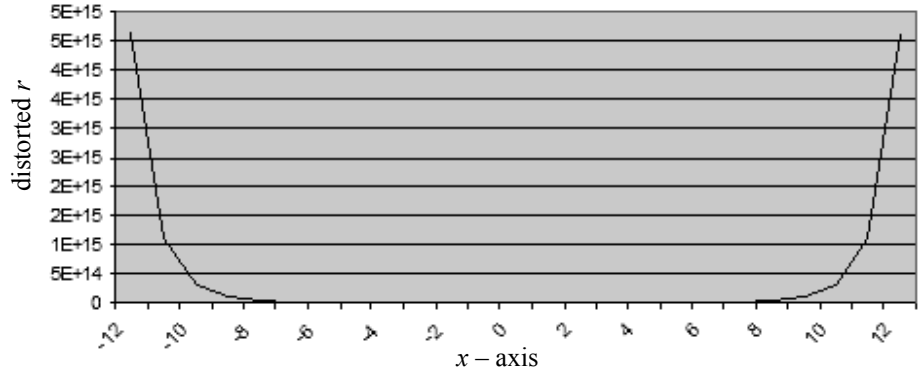

Fig. 5. Distorted coordinates of the electron's position (ρ) with interaction of time and space

We assume that logarithmic distortion for distorted time (6) and exponential distortion for distorted space (7). We think that distorted time should not vary exponentially, because distorted time coordinates should give the basis (less variable than exponential) of the 4-dimensional time and space even if they interact with space.

To calculate (6) and (7), we assigned a time coordinate *t* on the *x*-axis from +12 to -12, as the electron's initial position is at +12. According to (7), *R* is also affected by *t,* but it doesn't change as much as *r* does as shown in Fig. 6.

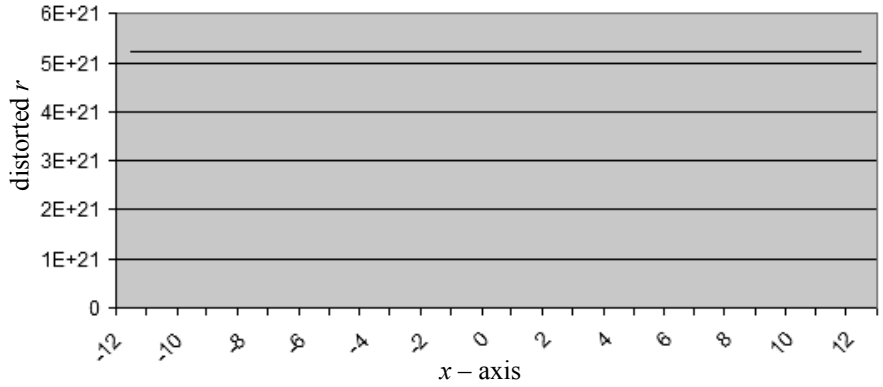

Fig. 6. Distorted coordinates of the proton's position (*R*) with interaction of time and space

For the distorted r and the distorted R, we used the same wave function (sine curve) as shown in Fig. 4.

ALGORITHM OF THE SIMULATION

The probability of charge exchange was calculated by the equation shown below:

$$H_1\varphi_n(r,R)X(R) = -\frac{1}{2}\nabla_r{}^2\varphi_n(r,R)X(R) -$$

$$-C_1\left(\frac{1}{r-(1/2)R}\right)\varphi_n(r,R)\,X(R) - C_2\left(\frac{1}{r+(1/2)R}\right)\varphi_n(r,R)X(R) + \frac{1}{R}X(R)\,. \quad (8)$$

For this numeric simulation, we defined that $-\frac{1}{2}\nabla_r{}^2\varphi_n(r,R)X(R) + \frac{1}{R}X(R)$ is a constant term (let's put it as *T*), and it is not affected by the geometry for the potential energy of the system in Fig. 1. Then we can use the matrix algebra shown below to calculate the coefficients, C_1 and C_2. Also, we don't need $X(R)$ henceforward, because (8) becomes independent from R. Then (8) becomes

$$H_1\varphi_n(r,R) = T - \left[-C_1\left(\frac{1}{r-(1/2)R}\right)\varphi_n(r,R) - C_2\left(\frac{1}{r+(1/2)R}\right)\varphi_n(r,R)\right] =$$

$$= T - \left[-C_1\left(\frac{1}{r-(1/2)R}\right)\sin w - C_2\left(\frac{1}{r+(1/2)R}\right)\sin w\right]. \quad (9)$$

When the reference [9] was published in 1969, a personal power computer of today was not available; therefore, it further described the algorithm in mathematical forms with calculus. Also, it suggested that the squared module of the coefficient C_2 of $-[1/(r+(1/2)R)]\phi_n$ gave the probability of charge exchange [9, p. 86]. In this research we used a personal computer to calculate the coefficients, C_1 and C_2, with the matrix algebra shown below.

First, we set a two-column matrix X,

$$X = \left[\frac{-1}{r+(1/2)R} \sin w \quad \frac{-1}{r-(1/2)R} \sin w \right] = \left[X_1 \quad X_2 \right],$$

and a two-row vector made of two coefficients, C_1 and C_2:

$$c = \begin{bmatrix} C_1 \\ C_2 \end{bmatrix};$$

now, (9) becomes as follows:

$$H_1 \varphi_n(r,R) = T - Xc = T - (C_1 X_1 + C_2 X_2).$$

Then we set the boundary conditions to solve the problem:

$$\frac{\partial [H_1 \cdot \varphi_n(r,R)]^2}{\partial C_n} = 0.$$

For example, in case of $n=1$, we have:

$$\frac{\partial [H_1 \varphi_n(r,R)]^2}{\partial C_1} = 2H_1 \varphi_n(r,R)(-X_1) = 0.$$

Then

$$X' H \varphi_n(r,R) = 0,$$

where X' is a transpose matrix of X.

On the other hand,

$$H \varphi_n(r,R) = T - Xc;$$

therefore,

$$X'(T - Xc) = 0.$$

Then, we can write:

$$X'Xc = X'T.$$

Therefore, the coefficients are calculated by the equation:

$$c = (X'X)^{-1} X'T,$$

where $(X'X)^{-1}$ is the inverse matrix of $X'X$. In this simulation, we set T as a 25 row-vector of unity (one), therefore the calculated coefficients are not absolute probabilities, but relative probabilities to the unity T. We think that it is sufficient to assign unity to T, because the goal of this simulation is to calculate the probabilities by means of relative squared modules of the coefficients. The calculated coefficients are proportional to the eigenvalues of the hydrogen atom.

RESULT

Fig. 7 and Fig. 8 show the calculated probabilities of the charge exchange and the elastic scattering of the slowly moving proton to the target electron. The probabilities shown in these figures are the calculated results that don't take distorted time and space. Table 1 shows the calculated values of these figures. The probability of the proton's elastic scattering is calculated by the squared coefficient C_1 divided by the sum of the squared coefficients of C_1 and C_2, and the probability of the proton's charge exchange is calculated by squared C_2 divided by the sum of the squared coefficients of C_1 and C_2.

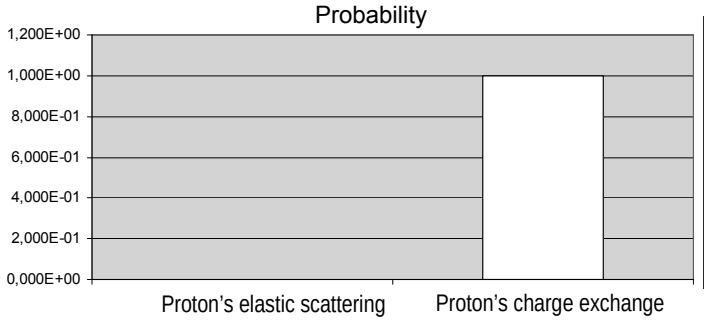

Fig. 7. Calculated probabilities of elastic scattering and change exchange with sin w_1 (without the distortion of time and space)

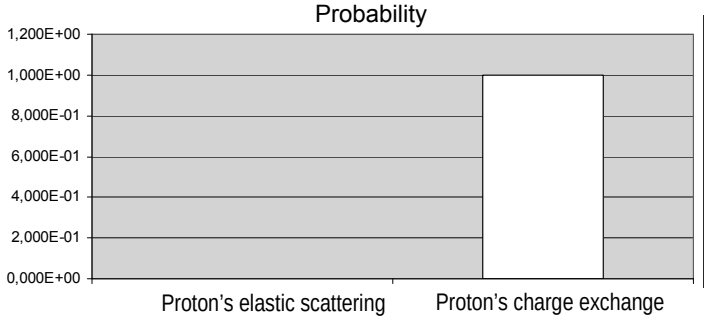

Fig. 8. Calculated probabilities of elastic scattering and change exchange with sin w_2 (without the distortion of time and space)

Table 1. Calculated probability without the distortion of time and space

Parameter		**C_1 for elastic scattering**	**C_2 for charge exchange**
Coefficient	W_1	$1{,}252 \cdot 10^{-2}$	$-6{,}220 \cdot 10^{-1}$
	W_2	$7{,}733 \cdot 10^{-3}$	$-6{,}068 \cdot 10^{-1}$
Squared coefficient	W_1	$1{,}568 \cdot 10^{-4}$	$3{,}868 \cdot 10^{-1}$
	W_2	$5{,}979 \cdot 10^{-5}$	$3{,}682 \cdot 10^{-1}$
Probability	W_1	$4{,}051 \cdot 10^{-4}$	$9{,}996 \cdot 10^{-1}$
	W_2	$1{,}624 \cdot 10^{-4}$	$9{,}998 \cdot 10^{-1}$

Note: The probability is a squared coefficient divided by the sum of squared coefficients

Fig. 9, Fig. 10 and Table 2 show the result of the simulation with the distorted time τ and distorted distance ρ. The probability of the charge exchange is lower than the probability without distortion shown in Fig. 7, Fig. 8 and Table 1. Instead, the probability of elastic scattering appears and reaches the same probability of charge exchange. It is also noted that the values of the coefficients of the equation shift from those without distortion of time and space. It means that the eigenvalues of Schrödinger equation (2) shift, i.e., the discrete energy states of the hydrogen atom also shift.

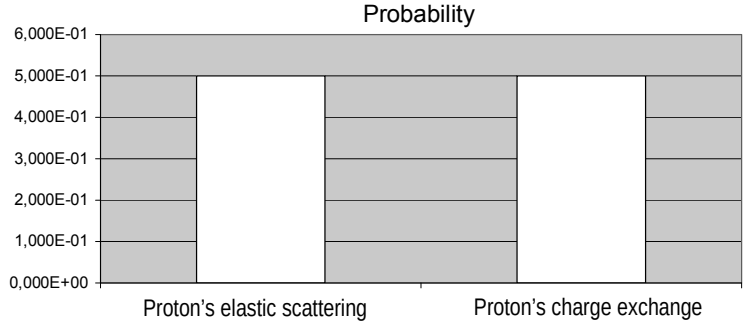

Fig. 9. Calculated probabilities of elastic scattering and change exchange with the distortion of time and space (sin w_1)

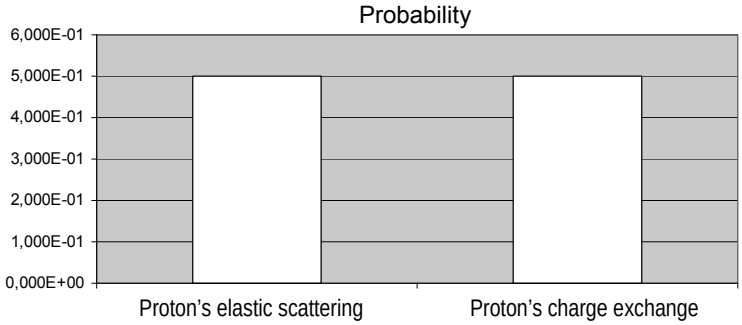

Fig. 10. Calculated probabilities of elastic scattering and change exchange with the distortion of time and space (sin w_2)

T a b l e 2. Calculated probability with the distortion of time and space

Parameter		**C_1 for elastic scattering**	**C_2 for charge exchange**
Coefficient	W_1	$1{,}597 \cdot 10^{27}$	$1{,}597 \cdot 10^{27}$
	W_2	$2{,}050 \cdot 10^{27}$	$2{,}050 \cdot 10^{27}$
Squared coefficient	W_1	$2{,}550 \cdot 10^{54}$	$2{,}550 \cdot 10^{54}$
	W_2	$4{,}204 \cdot 10^{54}$	$4{,}204 \cdot 10^{54}$
Probability	W_1	$5{,}000 \cdot 10^{-1}$	$5{,}000 \cdot 10^{-1}$
	W_2	$5{,}000 \cdot 10^{-1}$	$5{,}000 \cdot 10^{-1}$

Note: The probability is a squared coefficient divided by sum of the squared coefficients.

CONCLUSIONS AND RECOMMENDATIONS

The result of the simulation shows that the proton is captured by the hydrogen atom by the charge exchange at the beginning of nuclear fusion when the mass is

not yet heavy and when time and space are still independent. However, as the fusion process proceeds and time and space are interacted, the elastic scattering of the proton appears. It means that the nuclear fusion reaches saturation at some point of the process with the distorted time and space.

The experiment of nuclear fusion may verify the distortion of time and space. In our numeric simulation, the coefficient of the charge exchange differs between the cases with and without the distortion. It means that the discrete energy states of the electron in the hydrogen atom should also vary because the solution of discrete eigenvalues of Schrödinger equation (2) shifts from the case without the distortion to the case with the distortion. (The wave functions such as sine curves are continuous, but the equation (2) leads to the discrete eigenvalues that define the energy states of the hydrogen atom). Also, if the increased proton's elastic scattering is observed in the experiment, it verifies the distortion of time and space.

Therefore, if a laboratory experiment of nuclear fusion detects the shift of electron's energy states of the hydrogen atom and/or increase of the proton's elastic scattering, it will confirm the distortion of time and space in nuclear fusion.

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ДОВЕДЕННЯ ГІПОТЕЗИ СТОСОВНО ВІДХИЛЕННЯ ЧАСУ І ПРОСТОРУ НА ОСНОВІ МОДЕЛІ ЯДЕРНОГО СИНТЕЗУ / Й. Мацукі, П.І. Бідюк

Анотація. Дослідження присвячено сучасній тематиці: аналізу умов, які призводять до спотворення координат часу і простору, — явища, що є наслідком загальної теорії відносності, тобто коли час і простір стають взаємозалежними. Для аналізу використано інструментарій імітаційного моделювання з метою імітації руху протона, який вдаряє електрон атома водню. Методологія моделювання ґрунтується на обчисленні ймовірностей пружного розсіювання і обміну зарядами протона та цільового електрона. Таке спотворення моделюється функціями, які зв'язують логарифмічно координати часу і простору у випадку спотворення часу і експоненційно у випадку спотворення простору. Геометрію цієї взаємодії описано рівнянням Шредінгера з використанням хвильової функції електрона. Імовірність обміну зарядом обчислено діленням квадрата коефіцієнта хвильової функції на суму квадратів коефіцієнтів усіх членів рівняння. Результати розрахунків показують: імовірність обміну зарядом висока, якщо час і простір не мають відхилень, але коли час і простір спотворюються, вона зменшується і збільшується ймовірність пружного розсіювання. Отриманий результат свідчить про те, що дискретні рівні енергії електронів атомів водню зміщуються у випадку, коли у процесі ядерного синтезу виникає спотворення часу і простору.

Ключові слова: загальна теорія відносності, ядерний синтез, спотворення часу і простору, обмін зарядами.

ДОКАЗАТЕЛЬСТВО ГИПОТЕЗЫ ОБ ИСКАЖЕНИИ ВРЕМЕНИ И ПРОСТРАНСТВА НА ОСНОВЕ МОДЕЛИ ЯДЕРНОГО СИНТЕЗА / Й. Мацуки, П.И. Бидюк

Аннотация. Исследование посвящено современной тематике: анализу условий, которые приводят к искажению координат времени и пространства — явления, что является следствием общей теории относительности, т.е. когда время и пространство стают взаимно зависимыми. Для анализа использовано инструментарий имитационного моделирования с целью имитации движения протона, который ударяет электрон атома водорода. Методология моделирования основывается на вычислении вероятностей упругого рассеяния и обмена зарядами протона и целевого электрона. Такое искажение моделируется функциями, которые связывают логарифмически координаты времени и пространства в случае искажения времени и экспоненциально в случае искажения пространства. Геометрия этого взаимодействия описана уравнением Шредингера с использованием волновой функции электрона. Вероятность обмена зарядом вычислена делением квадрата коэффициента волновой функции на сумму квадратов коэффициентов всех членов уравнения. Результаты расчетов показывают, что вероятность обмена зарядом высока, если время и пространство не имеют отклонений, а если время и пространство искажаются, то она уменьшается и увеличивается вероятность упругого рассеяния. Полученный результат свидетельствует о том, что дискретные уровни энергии электронов атомов водорода смещаются в случае, когда в процессе ядерного синтеза возникает искажение времени и пространства.

Ключевые слова: общая теория относительности, ядерный синтез, искажение времени и пространства, перезарядка.