DETERMINISTIC PHYSICAL & INTELLIGENCE LEARNING BASED ON NEWTON'S ANTI-ENTROPY WITH SCREW-STRUCTURED PARTICLES

Chiharu Sano

Cliest Corp., Research Center

48-11 Nakazato, Hiratsuka-shi, Kanagawa-ken, 254-0054 Japan

E-mail: alai@yk.netlaputa.ne.jp Tel./Fax:81-468-75-9456

Abstract

Probabilistic information entropy can classify but never make learning, defined in A.I. as extraction of function from data. As Newton was inspired of the Third Law, observing screws, I create a model of screw-structured particles, to 100% respect it. The vacuum ether is an ocean of electron-positron pairs. An electron has an anti-clockwise winding outer electric spiral and a clockwise inner mass spiral. A positron has its symmetric structure. With the screw model, we can deterministically calculate several physical entities, overcome the eclecticism of Copenhagen doctrine, explain why an accelerated orbital electron doesn't emit light, why atoms linked by screw electrons form a stable molecule, why "strong interaction" is just a Coulomb force, how "quark" (=fake) appears. The universe was created from the vacuum.

[N.B.] For further details, please consult my thesis and dissertation.

I. Deriving the equation of Compton scattering

I.1. Compton scattering equation derivable, using micro-oscillation of physical time

Using the "micro-oscilation of physical time" I proposed in HYPOTHESIS-III, the equation of Compton scattering is derived.

$$\Delta x \cdot \Delta p = \frac{\eta}{2}$$

$$P = m \cdot v = m \cdot \frac{dx}{dt'}$$

Let us put: $t' = 2t - \frac{\eta}{\pi \cdot m \cdot c^2} \cdot \sin\left(\frac{2\pi \cdot m \cdot c^2}{\eta} \cdot t\right)$ where I put $2t$ instead of t.

As the electron rotates 360^{o}, $2\pi \cdot \Delta x$ can be considered here as $\Delta\lambda$. This rotation of 360^{o} is related to the principle «One Rotation One Action».

$$\frac{\Delta\lambda}{2\pi} \cdot \left(m \cdot \frac{dx}{dt'}\right) = \frac{\Delta\lambda}{2\pi} \cdot m \cdot \frac{1}{2 - 2 \cdot \cos\left(\frac{2\pi \cdot mc^2}{\eta} \cdot t\right)} \cdot \frac{dx}{dt} = \frac{\eta}{2}$$

Therefore $$\Delta\lambda = \frac{2\pi \cdot \eta}{mc} \cdot \frac{2 - 2\cos\left(\frac{2\pi \cdot mc^2}{\eta}\right)}{2} = \frac{h}{mc} \cdot \left(1 - \cos\left(\frac{2\pi \cdot mc^2}{\eta}\right) \cdot t\right)$$

I.2. Compton scattering equation derivable, introducing a term of Newtonian Action

The key-point is that if only we add a term derived from the action of Newton's third law to the momentum equation Compton and Eisnstein derived, we get the equation of Compton scattering. The number of electron-positron pairs taking part in the action/reaction of Compton scattering is: $\nu - \nu'$.

The action/reaction equation of Newton's third law for one electron of an electron-positron pair of vacuum interacting with the free electron, can be written as:

$$m_e \frac{dv}{dt} \cdot v_{\text{int}} = -m_{e^-e^+} \frac{dc}{dt} \cdot v_{\text{int}}$$

If we omit v_{int} of both sides and integrate both sides with regard to the time, we get:

$$m_e \cdot \Delta v = -m_{e^-e^+} \cdot c$$

$$\frac{1}{2} m_e \cdot (\Delta v)^2 = \frac{1}{2} m_{e^-e^+} \frac{m_{e^-e^+}}{m_e} c^2 = \frac{1}{2m_e} \left(\frac{\eta}{c}\right)^2$$

This is exactly the term we have to add to and modify the energy conservation law:

$$\frac{1}{2} m_e v^2 = \frac{1}{2m_e}\left(\frac{\eta}{c}\right)^2 (\nu - \nu') + \frac{1}{2} m_{e^-e^+} c^2 \cdot (\nu - \nu') = \frac{1}{2m_e}\left(\frac{\eta}{c}\right)^2 (\nu - \nu') + \eta \cdot (\nu - \nu')$$

The equations of momentum conservation are:

$$p \cdot \sin\alpha = \frac{h\nu'}{c} \cdot \sin\theta \,, \quad \frac{h\nu}{c} = p \cdot \cos\alpha + \frac{h\nu'}{c} \cos\theta$$

If we eliminate α, we get: $m_e v^2 = \frac{h^2}{m_e}\left(\frac{\nu}{c} - \frac{\nu'}{c}\right)^2 + \frac{2h^2 \nu \nu'}{m_e c^2}(1 - \cos\theta)$

$$h \cdot (\nu - \nu') = \frac{h^2 \nu \nu'}{m_e c^2}(1 - \cos\theta)$$

As the definition of Compton wave-length is $\Delta\lambda = \frac{c}{\nu'} - \frac{c}{\nu}$, we get: $\Delta\lambda = \frac{h}{m_e c}(1 - \cos\theta)$

II. "Newton's wave equation", i.e., Newton's original third law of action/reaction

$$\nu = \frac{\eta \kappa^2}{2m} \qquad \text{(a)}$$

derived from the quantum relation: $E = \frac{1}{2m} p^2$, $E = h\nu$ and $p = h\kappa$

I here use $\frac{d\nu}{d\kappa}$ as the velocity, as De Broglie, and derive a new wave equation which would be a quantum dynamic version of Newton's third law.

De Broglie put to be equal to the velocity of the matter wave V_g, and the right hand side can be transformed as follows, using the derivative in terms of space, just like Schroedinger's $div\ grad$ but here only $grad$.

$$V_g = \frac{d\nu}{d\kappa} = \frac{\eta\kappa}{m} = \frac{\eta}{m}\cdot\left(\frac{\partial}{\partial x},\frac{\partial}{\partial y},\frac{\partial}{\partial z}\right) \qquad \text{(c)}$$

Here just as De Broglie put $\phi = A\cdot\sin 2\pi(-\nu t+\kappa x)$, I put the wave function as:

$$\phi = F\cdot\cos 2\pi(\kappa r-\nu t) \qquad \text{(d)}$$

where F is the force or the derivative of the energy in terms of space distance. The reason why I use cosine instead of sine is that it concerns matter wave of matter made of Fermions. I mutiply the both hand sides of (c) by F. As $F = m\frac{\partial^2 r}{\partial t^2}$:

$$V_g\cdot\phi = \frac{\eta}{m}\cdot\left(\frac{\partial}{\partial x},\frac{\partial}{\partial y},\frac{\partial}{\partial z}\right)\phi$$

$$V_g\cdot F\cos 2\pi(\kappa r-\nu t) = \frac{\eta}{m}\cdot F\cdot\left(\frac{\partial}{\partial x},\frac{\partial}{\partial y},\frac{\partial}{\partial z}\right)\cos 2\pi(\kappa r-\nu t)$$

$$= -\frac{p}{m}\cdot F\cdot\sin 2\pi(\kappa r-\nu t)\cdot(1,1,1)$$

$$F\cos 2\pi(\kappa r-\nu t)\cdot V_g = -F\sin 2\pi(\kappa r-\nu t)\cdot V \qquad \text{(e)}$$

If only we put $F_1 = F\cos 2\pi(\kappa r-\nu t)$, $V_g = V_1$, $F_2 = F\sin 2\pi(\kappa r-\nu t)$, and $V = V_2$, the equation (e) can be seen as a quantum dynamics version of Newton's ThirdLaw of action and reaction.

$$F_1\cdot V_1 = -F_2\cdot V_2$$

II.1. Beta-decay deterministically explained by "Newton's wave equation"

Pauli «solved» the «energy conservation» problem by newly introducing the existence of a particle neutrino, but this does not mean that Pauli solved the question of «randomness» of the split of the total fixed energy between the electron and the neutrino in beta decay. But this, in fact, is not random and can be calculated according to the exact mathematical space-time point, using the above-mentioned wave function.

In the beta decay of neutron, the electron captured inside the nucleon and the electron-positron pair of the vacuum interact, and the emerging anti-neutrino is the destroyed form of the positron of the electron-positron pair of the vacuum, that is, the string of the spiral of the positron is broken. The shock of the neutron turning into the proton, that is, the inner electron of the neutron taken out of the nucleon by electron-positron pair of the vacuum, thereby turned inside-out to become the positron of the proton, destroys the spiral string of the positron of the vacuum, whose partner electron has clutched the inner electron of the neutron.

So, one of the wave equations is that of an electron which is a Fermion:

$$F\cos 2\pi(\kappa_{e^-} r - \nu_{e^-} t)\cdot V_g = -F\sin 2\pi(\kappa_{e^-} r - \nu_{e^-} t)\cdot V \qquad \text{(i)}$$

The other wave equation is that of the electron-positron pair (in other words, that is the so-called «photon») which is a Boson, because it is a combination of two Fermion electron-positron.

$$F\sin 2\pi(\kappa_{e^-e^+} r - \nu_{e^-e^+} t)\cdot V_g = F\cos 2\pi(\kappa_{e^-e^+} r - \nu_{e^-e^+} t)\cdot V \qquad \text{(j)}$$

$$F\cos 2\pi(\kappa_{e^-} r - \nu_{e^-} t)\,\sin 2\pi(\kappa_{e^-e^+} r - \nu_{e^-e^+} t)\cdot V_g$$
$$= -F\sin 2\pi(\kappa_{e^-} r - \nu_{e^-} t)\,\sin 2\pi(\kappa_{e^-e^+} r - \nu_{e^-e^+} t)\cdot V$$

$$F\cos 2\pi(\kappa_{e^-} r - \nu_{e^-} t)\,\sin 2\pi(\kappa_{e^-e^+} r - \nu_{e^-e^+} t)\cdot V_g$$
$$= F\cos 2\pi(\kappa_{e^-} r - \nu_{e^-} t)\,\cos 2\pi(\kappa_{e^-e^+} r - \nu_{e^-e^+} t)\cdot V \qquad \text{(j')}$$

$$F\sin^2 2\pi(\kappa_{e^-} r - \nu_{e^-} t)\cdot V + F\cos^2 2\pi(\kappa_{e^-} r - \nu_{e^-} t)\cdot V = 0 \qquad \text{(m)}$$

Please note that the first term comes from the electron, and the second from the electron-positron pair from which emerges the anti-neutrino. Please note that from (k) and (l), (m)

can also be written: $F\sin^2 2\pi(\kappa_{e^-} r - \nu_{e^-} t)\cdot V + F\cos^2 2\pi(\kappa_{\bar{\nu}} r - \nu_{\bar{\nu}} t)\cdot V = 0$ (m')

From (m) we get: $F \cdot V = 0$

This means the action, that is, the time derivative of energy, is zero. This explains why the sum of kinetic energies of the electron and the neutrino $T_e + T_{\bar{\nu}}$ that Pauli talked about is constant. Moreover, my above reasoning shows how that constant sum of energy is split between the electron and the anti-neutrino, that is,

between $F\sin^2 2\pi(\kappa_{e^-} r - \nu_{e^-} t)\cdot V$ and $F\cos^2 2\pi(\kappa_{\bar{\nu}}\cdot r - \nu_{\bar{\nu}}\cdot t)\cdot V$,

which are deterministically determined at the exact space-time point. We need No Probability & Statistics theories. We do not have to take any average at all. Experimet shows $T_e + T_{\bar{\nu}} = 1.16\ MeV$ And if we plot the number of electrons as the vertical axis versus the kinetic energy of the electron as the horizontal axis for beta decays repeated many times, we get a graph whose peak is at a little less than 0.3 MeV:

$$\frac{0.29\,MeV}{1.16\,MeV} \cdot 360^{\circ} \cong 90^{\circ}$$

is the commonly observed angle of play (loosely rotatable angle without collision) between the electron spiral and the positron spiral of the electron-positron pair of the vacuum. That difference of the angle 90° is well deduced in the equation (m') as the phase difference between cosine and sine. The energy ratio between the electron and the anti-neutrino is deterministically determined by the exact mathematical time at which the spiral string of the positron is broken.

III.Newton's inverse-square law derivable from Newton's third law & screw particles

Astonishingly, Newton's and Coulomb's inverse-square law, which are theories of fields, can be demonstrated based on Newton's Third Law of action/reaction, using the model of screw-structured particles along with the principle "One Rotation One Action". And from this theoretical demonstration, we can foresee its huge technological possibilities of application.

$$F_1 \cdot v_1 = -F_2 \cdot v_2 \qquad \text{or}$$

$$m_1 \left(\frac{d^2 x}{d t^2} \right)_1 \cdot \left(\frac{d x}{d t} \right)_1 = -m_2 \left(\frac{d^2 x}{d t^2} \right)_2 \left(\frac{d x}{d t} \right)_2 \qquad \text{(a)}$$

For a screw, v_1 and v_2 do not mean the velocity of linear motion but signify the Rotational velocity, more precisely, the rotational velocity (not the angular velocity) of a point on the rotating spiral of the screw. And this is the same for the screw of the electron-positron pair of vacuum.

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For a screw, v_1 and v_2 do not mean the velocity of linear motion but signify the the Rotational velocity (not the angular velocity) of a point on the rotating spiral of the screw. And this is the same for the screw of the electron-positron pair of vacuum. Let us suppose that an object charged with positive electricity and an object with negative electricity are located at a distance r first, then, reduce the distance by half to $r/2$. According to the principle "One Rotation One Action", though the distance is half now, the electron-

positron pair of vacuum carrying the action should quickly rotate one time, at a double velocity v_1', where the "space-distance grain" that is, the circular length (circumference) of the spiral $d\,x$, stays the same,

$$v_1' = 2 \cdot v_1 \quad \text{or} \quad \left(\frac{d x}{d t} \right)' = 2 \cdot \left(\frac{d x}{d t} \right). \text{ So } \frac{d x}{d t'} = 2 \cdot \frac{d x}{d t} \qquad \text{which means} \qquad d t' = \frac{d t}{2}$$

Thanks to Newton's third law, we can talk about the force or the acceleration with the same space-distance grain $d\,x$ and the different time grains $d\,t$ and $d\,t'$ in time of interaction.

$$\left(\frac{d^2 x}{d t^2} \right)' = \frac{d^2 x}{d t'^2} = \frac{d}{d t'} \left(\frac{d x}{d t'} \right) = \frac{d}{d t/2} \left(\frac{d x}{d t/2} \right) = 2^2 \cdot \frac{d}{d t} \left(\frac{d x}{d t} \right) = 2^2 \cdot \frac{d^2 x}{d t^2}$$

This signifies that the interacting force, that is, Newton's gravity or Coulomb's force, is inversely proportional to the square of the distance. Coulomb's inverse-square law corresponds to the first term of Lorentz force.

III.1. Technological possibilities of energy extraction from the vacuum

We have seen that if only we put electric charges in the space, when the space-distance is reduced to $1/2$, i.e., the space volume is reduced to $1/2^3$, the action becomes 2^3 times more. And please be aware that that energy is provided by the vacuum at each moment of time. So if we fractally put a pair of the aforementioned electric charges in each of 2^3 subspaces which are of 2^3 times reduced volume, in the entire space, we get $2^3 \cdot 2^3 = 2^6$ times more power, and so on. As in the vacuum there are so many interacting pairs of an electron and a positron, we can say that the vacuum has inexhaustible energy.

The above reasoning demonstrates that perpetual motion is possible, where if only electric charges are put in the space, the energy for the action/reaction is provided by the vacuum. The energy possibly taken from those electrically charged objects is in the form of action, i.e., pushing/pulling force and rotational motion.

Conventional physicists believed to have demonstrated that no perpetual motion is possible. However, they always wondered and secretly asked themselves why atomes and molecules are perpetually in motion.

IV. Space-time relation $x = a t^{\frac{2}{3}}$ derived from Newton's inverse-square law

$$m \cdot \frac{d^2 r}{d t^2} = -G \frac{m \cdot M}{r^2}$$

$$\frac{d^2 r}{d t^2} = -\frac{G M}{r^2}$$

where M is considered to be constant in terms of t and r . I solve this differential equation, supposing r is a function of t . The result is:

$$r = 2^{\frac{1}{3}} \cdot \left(\frac{3}{2}\right)^{\frac{2}{3}} \cdot (GM)^{\frac{1}{3}} \cdot t^{\frac{2}{3}} \qquad \text{(a)}$$

which shows the space-time relation Using the space-time realtion and $\Delta x \cdot \Delta p = \frac{\eta}{2}$, I get mass-time relation:

$$M = \frac{3\eta}{8a^2} \cdot \frac{1}{t^{\frac{1}{3}}} = \frac{b}{t^{\frac{1}{3}}} \qquad \text{(b)}$$

IV.1. Einstein's "time-delay ratio" derivable from space-time relation

$$x = x_0 + v_0 t + \frac{1}{2!} a_0 t^2 + \frac{1}{3!} a_0' t^3 + \cdots$$

So that we can freely set v_0, a_0, a_0', etc, we set: $r = x = \ln(t+1)$.

To what extent the internal physical action/reaction time t' of $x = a t'^{\frac{2}{3}}$ is delayed compared with the time t for the motion equation? I represent the delay in terms of the physical velocity of motion:

$$v = \frac{dx}{dt} = \frac{1}{t+1}, \qquad t + 1 = \frac{1}{v}$$

As $t'^{\frac{2}{3}} = \ln(t+1)$, so $\dfrac{dt}{dt'} = \dfrac{2}{3}\dfrac{t+1}{\sqrt{\ln(t+1)}} = \dfrac{2}{3}\dfrac{1/v}{\sqrt{\ln\left(1/v\right)}} \cong \dfrac{2}{3} \cdot \dfrac{1}{\sqrt{-\frac{1}{2} + 2v - \frac{3}{2}v^2}}$

approximately.

Let us reason around $v \cong 1$, which signifies $v \cong c$.

As $(v-1)^2 \cong 0$, $-\frac{1}{2} + 2v - \frac{3}{2}v^2 \cong \frac{1}{2} - \frac{1}{2}v^2$.

$$\frac{dt}{dt'} \cong \frac{2}{3}\frac{1}{\sqrt{1/2 - v^2/2}} = \frac{2\sqrt{2}}{3}\frac{1}{\sqrt{1-v^2}} = \frac{2.8284...}{3}\frac{1}{\sqrt{1-v^2}} \cong \frac{1}{\sqrt{1-v^2}} = \frac{1}{\sqrt{1-v^2/c^2}}$$