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Sayed`s Theory in Quantum Mechanics: An Innovative Approach for Wave Function Equations Measurability, Efficacy and Universality

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Abstract

Allah (God) is ubiquitous and the only Creator of Everything. Quantum mechanics is the world of the microscopic scale of physics. The universe is a macroscopic semblance of the quantum approximation. In this revolutionary article, correctness and rectification of Schrodinger wave equations that has huge limitations and shortcomings, were proudly achieved. The Sayed quantum wave function (SQWF) was derived and defined (Ψs) as a function in wavelength and light speed for free electron and in Laplace coordinates. The SQWF was calculated and quantified for de Broglie moving electron to be; $0.4033x10^{-20}$ Second. The speed of light was accurately calculated; $\sim 3x10^{8}$ m/s. An outstanding Sayed`s quantum wavelength (SQW) was proposed and elucidated. The Sayed time dependent wave function equations (STDWFE) were derived and given to be a globalized generic alternative to deal with all atoms rather than the one electron atoms of Schrodinger. The crucial parameters; wavelength, Rydberg constant R_H, atomic number, principle quantum number, and mc^2 were introduced in the STDWFE; it is a quantized formula. The (Ψs) was calculated and found to be $7.148x10^{-22}$ and $1.995x10^{-22}$ second.for H and He respectively. The Sayed quantum constant; R_H mc^2, was quantified to be $8.93x10^{-7}$ J/m.

Keywords: Innovation in quantum mechanics, Sayed wave function (Ψs), Schrodinger equation rectification.

I. Introduction

The Rutherford and Bohr models of atom are the cornerstone of nuclear physics. The entire body of physics developed before quantum mechanics is called classical physics. This specialized branch of physics mainly deals with subatomic particles and the era where Newtonian laws are not obeyed. The quantum mechanics, the world of probability and waves nature, is no longer a theoretical field of physics; it is being applied in many axes of science and engineering (1,2,3,4,5,6,7). The main key of quantum theory can be expressed in the following statement: Everything is a wave (8). The quantum entanglement opened the door for a new era of applications including quantum computer, quantum radar, teleportation, 3D tomography and secured quantum communication.

This article is an outstanding approach to correct, generalize and universalize the Schrodinger wave function equation to deals with all atoms rather than one electron system such as hydrogen and similar hydrogen atoms. Deduce a wave function that can experimentally measurable is also an ambitious objective

II. Chronology and Survey

The quantum mechanics era gives a new spirit of a new field of science rather than the classic mechanics of Newton and relativity of Einstein. Some of the key stations and recent publications of this topic are given (1-7,9,10):

- Max Planck,1900, quantization of energy; Black body radiation,
- Einstein,1905, published a paper proposes photons of light is quantized (quanta) ; each quantum of light has energy proportional to its frequency, the photoelectric effect.
- Rutherford-Bohr model,1913, quantized shell model of atom ; quantized energy of orbit
- De Broglie, 1924, wave-matter duality concept; rearrangement of the Planck-Einstein equations.
- Schrodinger,1926, published his wave function (Ψ) equation combining De Broglie equation to describe the distribution of electron in an atom.
- Max Born, in 1926, consider that the $|\Psi|^2$ has a positive value and represents the probability of finding a particle at specific point and time; to avoid Schrodinger failure.
- Heisenberg uncertainty principle,1927; velocity and position of a particle cannot be accurately measured at the same time.

- Dirac equation, 1928, developed the wave equation to be correlated with relativity theory; relativistic wave equation and predication of antimatter.
- Sayed theory, 2021, Fusion of classic, relativity and quantum mechanics, showing violation of light speed, was published.
- Sayed theory of quantum gravity force, 2023, was also published
- The faster-than-light travel of particles inside a quantum tunnel has prompted researchers to question whether we have accurately measured time (11).

III. Schrodinger wave equation and its limitation and weakness

The Schrödinger equation is a linear partial differential equation that governs the wave function of a quantum-mechanical system. The major shortcomings of Schrodinger wave equation are (1,2,12 ,13,14).

- The wave function ψ associated with a moving particle is not a measurable quantity
- It has no direct physical meaning and interpretation. Quantum Mechanics shows that Ψ cannot be experimentally observed; measurement problem.
- The equation deals with one electron system (e.g. H, He^{+}, Li^{2+}, Be^{3+}, B^{4+}, C^{5+}, etc.). In actual atoms, interelectronic Coulomb energy changes “dependent” on other Coulomb terms (electron-nucleus) and atomic kinds. This is the reason why Schrodinger equation is wrong, and cannot solve multi-electron atoms (12,13)

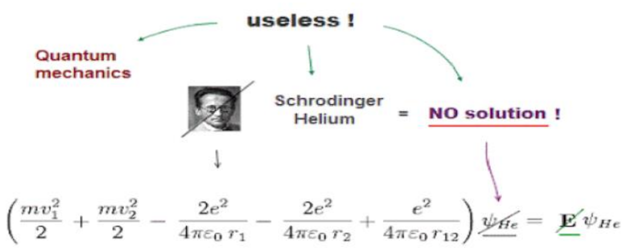

Fig. 1: Shows non solution of Helium atom using Schrodinger equation

- There is no analytic solution for Ψ for all other atoms, ions, and molecules.
- The Schrodinger equation uses the non-relativistic momentum, which will be wrong at high momenta; Dirac corrected Schrodinger equation to be a relativistic equation.
- The spin is not included in the Schrodinger equation. An improved version includes spin was created by Pauli.
- The Schrodinger equation can’t explain the Stern-Gerlach experiment
- The Schrödinger’s equation says nothing about why finding the particle in one spot and where that spot should be.
- The coulomb potential energy of the proton-electron pair in Hydrogen atom is essentially the negative interaction energy between their superposed electrostatic fields which is inversely proportional to their instantaneous separation distance. Assuming the proton to be relatively fixed at the origin of an appropriate coordinate system, the potential energy of the orbiting electron will be a function of instantaneous position coordinates of the electron. This has not been properly modeled in the Schrödinger equation. The resulting errors in the solution have been quantitatively demonstrated in this paper (15)
- Einstein, Podolsky and Rosen (EPR), 1935, published the famous EPR paradox against quantum mechanics
- Richard Feynman, 1965, remarked “I think I can safely say that nobody understands quantum mechanics”.
- Quantum Monte Carlo simulations; new method of wave function matching by mapping the complicated problem in a first approximation to a simple model system can be efficient and powerful, they have a significant weakness: the sign problem. It arises in processes with positive and negative weights, which cancel each other. This cancellation leads to inaccurate final predictions (16)
- Research on tachyons, particles theorized to move faster than light, has progressed significantly, revealing that prior inconsistencies within quantum mechanics stemmed from inadequate boundary conditions. (17).

The terminologies of wave function equation and the corresponding ones in classic mechanics are given in Table 1 (1-7).

Table 1: Some Quantum and Classic Mechanics Mathematical Terminology

Terminology	Classic	Quantum
Energy	$E=F.\,d = mc^2 = pc$ $E^2 = (mc^2)^2 + (pc)^2$	$E = h\,\nu = h\,c/\lambda$ $E = i\,\hbar\,\partial/\partial t$
Kinetic energy	$\frac{1}{2}\,mv^2$	$(P^2/2m) = (P^2/2m)^2$
Momentum	P=mv	$\acute{P} = -i\,\hbar$
Potential energy	V(x), V(r)	V(x), V(r)
Coordinates	x, y, z	x, y, z

The next figure 2 represents the time dependent Schrodinger equation and Hamiltonian operator. It describes how a physical system changes over time (1,2,18).

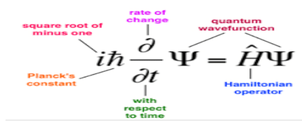

Fig.2: Represents time dependent Schrodinger equation and Hamiltonian operator.

The Schrodinger equation in three dimensional is expressed as shown in the follow figure number 3 (19)

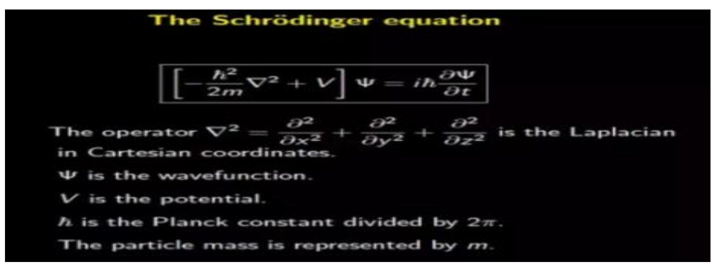

Fig. 3: The Schrodinger equation in Cartesian coordinates

IV. Derivation of Sayed Quantum Wave Function Equations (SQWFE)

a) Sayed Wave Function(for Free Particle; electron

The quantum wave function $\Psi(x,t)$ can be described (20):as given by the following wave equation

$Y(x,t) = A \sin(kx-\omega t)$ or as ; $\Psi(x,t) = A\, e^{i(kx-\omega t)}$,Where A, k, ω, t and x are the amplitude of oscillation, wave number, angular frequency, time and position; the solution of this equation leads to the Schrodinger wave equation. To derive a measurable wave function; Correction of Schrodinger equation, the following form of the wave mechanics equation will be taking into consideration; where Ή is the Hamiltonian operator; it represents the total energy, summation of kinetic energy (K.E.) and potential energy (V):

$i\hbar\, \partial\Psi/\partial t = Ή\Psi$ 1

$\Psi = (i\hbar\, \partial\Psi/\partial t)/\, Ή$ 2

$\Psi = (i\hbar\, \partial\Psi/\partial t)/\, (k.E.+V)$ 3

By substituting the value of kinetic energy ($k.E. = 1/2\, mv^2 = h^2/2m\lambda^2$) in equation 3, gets

$\Psi = (i\hbar\, \partial\Psi/\partial t)/\, (h^2/2m\lambda^2+V)$ 4

Considering free particle; electron, the potential V=0. The equation 4 to be;

$\Psi = (i\hbar\, \partial\Psi/\partial t)\, 2m\lambda^2/ h^2$ 5

Referring to de Broglie wavelength; λ=h/mv or m = h/λv and substitute in the above equation no. 5

$\Psi = (i\hbar\, \partial\Psi/\partial t)\, 2h\lambda^2/ \lambda v h^2$ 6

$\Psi = (i\hbar\, \partial\Psi/\partial t)\, 2\lambda/ vh$ 7

Where, ħ = h/2π and suppose that the speed approaching light speed; v≈c, one gets

$\Psi = (i\hbar\, \partial\Psi/\partial t)\, 2\lambda/ 2\pi\, \hbar\, c$ 8

$\Psi = (i\, \partial\Psi/\partial t)\, \lambda/ \pi\, c$ 9

$\Psi = (i\, \partial\Psi/\partial t)\, (1/\pi).\, (\lambda/c)$ 10

The imaginary number i equal (√-1). It can also be expressed as (π/2).The multiplication of (i x 1/i = +1). So the equation 10 can be expressed as:

$\Psi = (\pi/2).(\partial\Psi/\partial t).(1/\pi).(\lambda/c)$ 11

$\Psi = (\partial\Psi/\partial t)\, (\lambda/2c)$ 12

The rearrangement of equation 12, it produces Sayed quantum wave function

$\Psi s =(\Psi/(\partial\Psi/\partial t))= \lambda/2c$ 13

$$\mathbf{\Psi s =[(\Psi/\partial\Psi)\partial t]= \lambda/2c} \quad \mathbf{(14)}$$

This formula that defines the wave function is called **Sayed quantum wave function (SQWF).** It is a revolutionary approach for correction of Schrodinger wave function. *It can be concluded that Ψs has the following crucial criteria.*- The **Ψs** is not an imaginary wave function

- The **Ψs** has a positive and measurable value and its unit is in second.
- The **Ψs** is a direct function in the wavelength λ.
- The **Ψs** is inversely proportional to the double of light speed; c.

The square of Sayed wave function (SQWF) can be given as;
$\Psi^2= (i).(\partial\Psi/\partial t)^2.(1/\pi^2).(\lambda^2/c^2)$ 15

$\Psi^2 = (\pi^2/4).(\partial\Psi/\partial t)^2.(1/\pi^2).(\lambda^2/c^2)$ 16

$$\mathbf{\Psi^2_s=(\Psi^2/ (\partial^2\Psi/\partial t^2)= \lambda^2/4c} \quad \mathbf{(17)}$$

$\Psi^2_s=\{(\Psi/\partial\Psi)\, \partial t\}^2= (\lambda^2/4c^2)$ 18

This means that the Max Born $|\Psi|^2$ that represents the probability of finding a particle at specific point and time, can also be defined according to the equations 17 or 18 of $\mathbf{\Psi_s^2}$. The following table 2 shows the results of the calculated Sayed wave function (Ψ_s), frequency and light speed for some wavelengths of different elements; H, He, Li, B, Na, Mg, Al, ,Cu, Zn, Cs, ,U and Th.

Table 2: Calculated Sayed Wave Function (Ψ_s), Frequency and Light Speed for some Wavelengths

Element	Wavelength (m)	**Sayed Wave function (Sec.)** **(Ψ_s)= λ /2c**	Inverse of wave function **(1/ Ψ_s)** in sec^{-1}	Calculated light speed **c = λ /2Ψ_s**	Frequency (Cycle/sec.)
De Broglie moving electron	2.42×10^{-12}	0.4033×10^{-20}	2.479×10^{20}	~ 3×10^8 m/s	1.2388×10^{20}
H emits photon (visible spectrum)	656.3 nm	1.094×10^{-15}	9.14×10^{14}	~ 3×10^8	4.5679×10^{14}
H emission spectrum	121.5 nm	2.025×10^{-16}	4.938×10^{15}	~ 3×10^8	2.467×10^{15}

He visible spectrum	588 nm	$9.8x10^{-16}$	$1.02x10^{15}$	$\sim 3x10^{8}$	$5.0985x10^{14}$
He atomic emission	58.4 nm	$9.733x10^{-17}$	$1.027x10^{16}$	$\sim 3x10^{8}$	$5.133x10^{15}$
Li light emitted	670.8 nm	$1.118x10^{-15}$	$8.94x10^{14}$	$\sim 3x10^{8}$	$4.469x10^{23}$
Be visible emission	587.09 nm	9.785×10^{-16}	1.0219×10^{15}	$\sim 3x10^{8}$	$5.106x10^{14}$
B emits light	518 nm	$3.333x10^{-15}$	$3.00x10^{14}$	$\sim 3x10^{8}$	$5.787x10^{14}$
Na light emitted	589 nm	$9.817x10^{-16}$	$1.01x10^{15}$	$\sim 3x10^{8}$	$5.089x10^{14}$
Mg atoms	518.36 nm	$8.639x10^{-16}$	$1.157x10^{15}$	$\sim 3x10^{8}$	$5.783x10^{14}$
Al photoelectric threshold	332	$5.533x10^{-16}$	$1.807x10^{15}$	$\sim 3x10^{8}$	$9.0298x10^{14}$
Cu light emitted	837 nm	$1.395x10^{-15}$	$7.168x10^{14}$	$\sim 3x10^{8}$	$3.581x10^{14}$
Zn metal emission	280.08	$4.668x10^{-16}$	$2.14x10^{15}$	$\sim 3x10^{8}$	$1.070x10^{15}$
Cs light	460 nm	$7.66x10^{-16}$	$1.305x10^{15}$	$\sim 3x10^{8}$	$6.517x10^{14}$
Th (very wide range)	250 nm 5500 nm	$4.167x10^{-16}$ $9.167x10^{-15}$	$2.399x10^{15}$ $1.0908x10^{14}$	$\sim 3x10^{8}$ $\sim 3x10^{8}$	$1.199x10^{15}$ $5.451x10^{13}$
U238 III	303.79	$5.063x10^{-16}$	$1.975x10^{14}$	$\sim 3x10^{8}$	$9.868x10^{14}$

Based on the results given in table 2, it can be seen that the $\boldsymbol{\Psi_s}$ is in the range of $9.733x10^{-17}$ to $9.167x10^{-15}$ second. The light speed using SQWF equation was accurately calculated and found to be identical to the Einstein light speed value $\sim 3x10^{8}$ m/s

b) Sayed Wave Function (Ψ) in three Dimensions.

By using the next Schrodinger time dependent wave equation, a measurable wave function will be derived as follow;

$$i\hbar\, \partial\Psi/\partial t = [(-\hbar^2/2m)\, \nabla^2 + V]\, \Psi \quad 19$$

Where the operator $\nabla^2 = \partial^2/\partial x^2 + \partial^2/\partial y^2 + \partial^2/\partial z^2$ is the Laplacian in Cartesian coordinates. Taking into consideration that; $m=h/\lambda v$; speed of particle $v \approx c$ and light speed $c=E\lambda/h$, one gets:

$$i\hbar\, \partial\Psi/\partial t = [(-\hbar^2\, \lambda^2 E/2h^2)\, \nabla^2 + V]\, \Psi \quad 20$$

By substituting the value of; $h=2\pi\hbar$ and the potential $V=0$, it produces;

$$i\hbar\, \partial\Psi/\partial t = [(-\lambda^2 E/8\pi^2)\, \nabla^2]\, \Psi \quad 21$$

$$i\hbar\, \partial\Psi/\partial t = [(-\lambda^2 E/8\pi^2)\, \nabla^2\,]\, \Psi \quad 22$$

By multiplying both side in the imaginary number i and considering that the imaginary number $i=\sqrt{-1}$, $i \times i= -1$. The, i can also be expressed as $\pi/2$. The final equation will be;

$$(i.i)\hbar\, \partial\Psi/\partial t = [i\, (-\lambda^2 E/8\pi^2)\, \nabla^2]\, \Psi \quad 23$$

$$\hbar\, \partial\Psi/\partial t = [(\pi/2)\, (\lambda^2 E/8\pi^2)\, \nabla^2]\, \Psi \quad 24$$

$$\hbar\, \partial\Psi/\partial t = (\lambda^2 E/16\pi)\, \nabla^2\, \Psi \quad 25$$

$$\Psi = (\hbar\, \partial\Psi/\partial t\,)/(16\pi\, /\lambda^2 E)\, \nabla^2 \quad 26$$

$$\Psi = (16\pi\, \hbar)\, (\partial\Psi/\partial t\,)/\, \lambda^2 E\, \nabla^2 \quad 27$$

$$\Psi s = (\, \Psi\, (\partial\Psi/\partial t\,) = 16\pi\, \hbar\, /\, \lambda^2 E\, \nabla^2 \quad 28$$

$$\mathbf{\Psi s = (\Psi\ (\partial\Psi/\partial t\ ) = 16\pi\ \hbar\ /\ \lambda^2 E\ \nabla^2} \qquad \textbf{(29)}$$

This formula is called **Sayed Wave function in 3D (SQWF-3D**). By using the Einstein formula of energy; $E=mc^2$, the equation 29 can be restated as:

$$\mathbf{\Psi s = (\Psi\ (\partial\Psi/\partial t\ ) = 16\pi\ \hbar\ /\ \lambda^2\ mc^2\ \nabla^2} \qquad \textbf{(30)}$$

Based on the (SWF-3D) formula, the Ψs is in second unit and correlated with λ, m, ħ and light speed

c) Rectification and Correction of Schrodinger Wave Function Equation

The following derivation is to correct and universalize Schrodinger equation; rectifying his imaginary linear wave function equation. Taking into consideration the next form of the Schrodinger time dependent wave mechanics equation;

$i\hbar\ \partial\Psi/\partial t = ((-h^2/2m\lambda^2\ )\ \nabla^2 + V\ )\Psi$ 31

The kinetic energy K.E. can be defined for electron bound to a nucleus as follows:

$K.E. = ze^2/8\pi\epsilon_o\ r$ 32

The orbital radius can be expressed as ;

$r_n = \epsilon_o\ n^2h^2/\ \pi\ m\ z\ e^2$ 33

Substitute value of r (eq. 33) in K.E (equation 32), one gets

$K.E. = z^2m.e^{4/}8n^2h^2\epsilon_o^2$ 34

By equating kinetic energy in eq. 34 and K.E.= ½ $mv^2 = h^2/2m\lambda^2$, the wavelength square (λ^2) is obtained as follow;

$$\boldsymbol{\lambda_s^2 = 4n^2h^4\epsilon_o^2\ /\ z^2\ m^2e^4} \qquad \textbf{(35)}$$

$\lambda = \sqrt{4n^2h^4\epsilon_o^2\ /\ z^2\ m^2\ e^4} = 2nh^2\epsilon_o\ /\ z\ m.e^2$ 36

This derived wavelength is called ***Sayed quantum wavelength (SQW).*** This formula shows that the wavelength is quantized and a function in the principle quantum number square (n^2).

Substitution the value of λ^2 (equation 35) in equation 31, it produces

$i\hbar\ \partial\Psi/\partial t = (-h^2\ z^2\ m^2e^4/\ 2m.\ 4n^2h^4\epsilon_o^2)\ \nabla^2 + V\ )\Psi$ 37

$i\hbar\ \partial\Psi/\partial t = (-z^2\ m.e^4/\ 8n^2\ h^2\epsilon_o^2\ )\ \nabla^2 + V\ )\Psi$ 38

$i\hbar\ \partial\Psi/\partial t = (\{-(z^2/\ n^2).(m.e^4/\ 8h^2\epsilon_o^2)\}\ \nabla^2 + V\ )\Psi$ 39

Multiply and divide by hc, one gets;

$i\hbar\ \partial\Psi/\partial t = (\{-(\ z^2/\ n^2).(hc/hc).\ (m.e^4/\ 8h^2\epsilon_o^2)\}\ \nabla^2 + V\ )\Psi$ 40

$i\hbar\ \partial\Psi/\partial t = (\{-(\ z^2/\ n^2).(h.c).(m.e^4/\ 8\epsilon_o^2\ h^3\ c)\}\ \nabla^2 + V\ )\Psi$ 41

The Rydberg constant R_H for Hydrogen atom; z =1, has the following value;

$R_H = m.e^4/\ 8\epsilon_o^2\ h^3\ c$ 42

By including the Rydberg value (eq. 42) in equation 41, produces

$i\hbar\ \partial\Psi/\partial t = (\{-(\ z^2/\ n^2).(hc).\ (R_H)\}\ \nabla^2 + V)\Psi$ 43

Considering Planck energy; E=hν = h c/λ, and Einstein energy $E=mc^2$, one gets the Planck constant h=mλc . By substituting h value in equation 43;

$i\hbar\ \partial\Psi/\partial t = (\{-(\ z^2/\ n^2).(m\lambda c^2).\ (R_H)\}\ \nabla^2 + V\ )\Psi$ 44

The final form of ***Sayed wave function equation***; the corrected Schrodinger time dependent wave function equation is:

$$\mathbf{i\hbar\, \partial\Psi/\partial t = (\{-\lambda\, (z^2/ n^2).(mc^2).(R_H)\}\, \nabla^2 + V\,)\Psi} \qquad \textbf{(45)}$$

$$i\hbar\, \partial\Psi/\partial t = (\{-\lambda\, (z^2/ n^2).(S_c)\}\, \nabla^2 + V\,)\Psi \qquad 46$$

Where, Sc is called ***Sayed wave constant*** and equals; $S_c = R_H\, mc^2 = 1/m\ kg.\ m^2/s^2$ = 8.932x10-7 N or J/m. The equation 45 can also be stated taking into consideration the $R_H = 1/\lambda.(1/n_f^2 - 1/n_i^2)$, where n_i and n_f are the initial an final transition

$$\mathbf{i\hbar\, \partial\Psi/\partial t = (\{-\lambda\, (z^2/ n^2).(mc^2).(1/\lambda(1/n_f^2 - 1/n_i^2)\}\, \nabla^2 + V\,)\Psi} \qquad \textbf{(47)}$$

This equation is called ***Sayed time dependent wave function equation (STDWFE)*** and has the following revolutionary criteria:

- It is quantized and correlated to the square of the quantum number (n)
- It is proportional to the atomic number square (z)
- It is proportional to the wavelength λ
- It is relativistic and correlated with mc^2
- It is correlated to the Rydberg constant R_H

t might be stated that STDWFE is a Generic equation to be used for all atoms; not only specific for one electron system; as in Hydrogen atom of Schrodinger equation. The lowest energy level is the innermost electron orbit (1s<2s<2p<3s<3p<4s<3d<4p<5s<4d,…….).The V can be neglected in equation 45. Then the equation 45 can be restated as follow:

$$\mathbf{i\hbar\, \partial\Psi/\partial t = (\{-\lambda\, (z^2/n^2).(mc^2).(R_H)\}\nabla^2\,)\Psi} \qquad \textbf{(48)}$$

By multiplying both sides in the imaginary number i (i x i=-1) and substitute by the value i=π/2, one gets

$$\hbar\, \partial\Psi/\partial t = (\{\lambda(z^2/n^2).(mc^2).(R_H)\}\, \nabla^2\,)\Psi \qquad 49$$

The Sayed quantum wave function Ψs can also be produced by rearrangement of equation 49 to be:

$$\Psi /(\hbar\, \partial\Psi/\partial t) = 1/\{\lambda\, (\pi/2).\, (z^2/n^2).(mc^2).(R_H)\}\, \nabla^2\,) \qquad 50$$

$$\Psi /(\partial\Psi/\partial t) = 2\, \hbar\, n^2/ (\lambda\, \pi\, z^2.mc^2.R_H)\, \nabla^2 \qquad 51$$

$$\mathbf{\Psi s = (\Psi /\partial\Psi)\partial t = 2\, \hbar\, n^2/ (\lambda\, \pi\, z^2.mc^2.R_H)\, \nabla^2} \qquad \textbf{(52)}$$

This equation shows ***Sayed quantum wave function*** as a function in λ , n^2, z^2, mc^2,R_H , in Laplace 3D (∇^2). It can also observe that the **Sayed quantum wave function is quantized**. Some calculations were carried out based on equation 52 and the next figure 4. The results are given in table 3.An example for Hydrogen atom is given as follows;Ψs = (2 x 6.626 x10-34 x 1) / (3.14159 x 656.3 x10-9 x1 x 9.109 x10-31x 3x108 x 1.09677x107)= 7.148x10-22

Summary of Allowed Combinations of Quantum Numbers

n	l	m	Subshell Notation	Number of Orbitals in the Subshell	Number of Electrons Needed to Fill Subshell	Total Number of Electrons in Subshell
1	0	0	1s	1	2	2
2	0	0	2s	1	2	
2	1	1,0,-1	2p	3	6	8
3	0	0	3s	1	2	
3	1	1,0,-1	3p	3	6	
3	2	2,1,0,-1,-2	3d	5	10	18
4	0	0	4s	1	2	
4	1	1,0,-1	4p	3	6	
4	2	2,1,0,-1,-2	4d	5	10	
4	3	3,2,1,0,-1,-2,-3	4f	7	14	32

Figure 4: The allowed combinations of quantum numbers (*https://chemed.chem.purdue.edu/*)

Table 3: Results of Sayed Wave Function Ψs Calculation for some Elements

z (Atomic number)	Λ (One of the selected Wavelengths)	**Ψs** Sayed wave function
1, (H)	656.3 nm	$7.148x10^{-22}$
2, (He)	588 nm	$1.995x10^{-22}$
3, (Li)	670.8 nm	$3.108x10^{-22}$
4,..(Be)	587.09 nm	1.997x10-22
5, (B)	518 nm	$1.449x10^{-22}$

d) Validation and Verification (VV) of the derived equations and Formulas

i) The derived Sayed quantum wave function Ψs ; Balance of equation units

$\Psi s = (\Psi/(\partial\Psi)\partial t)) = \lambda/2c$ 14

Second = m/ (m/s) =Second

$\Psi s = (\Psi (\partial\Psi/\partial t)) = 16\pi \hbar / \lambda^2 E \nabla^2$ 29

Second= $j.s/ m^2. j. 1/m^2$ = Second

$\Psi s = (\Psi/\partial\Psi)\partial t) = 16\pi \hbar / \lambda^2 mc^2 \nabla^2$ 30

Second = $j.s./ m^2 kg\ m^2/s^2.1/m^2$ =Second

Where, Joule (j)=N.m and Newton(N)=$kg.m/s^2$

ii) The derived Sayed quantum wavelength (SQW)

$\lambda_s^2 = 4n^2h^4\epsilon_o^2 /z^2 m^2.e^4$ 35

$m^2 = (J.s)^4 (C^2/Nm^2)^2 / (kg^2) (C^4)$

Where, Planck constant; h, in Joule second (or N.m.s), ϵ_o in C^2/Nm^2 , mass in kg and electron charge in coulomb (C).

$\lambda^2 (m^2) = (N^4 m^4.s^4)(C^4/N^2m^4)/ (kg^2) (C^4)$

$\lambda^2 (m^2) = (N^2.s^4)/ (kg^2)$

Where, Newton (N) = kg m/s^2

Finally, the λ_s^2 is in square meter in both sides; the wavelength λ is in meter (m).

Further development for the derived equations is on-going activities to be published with more detailed calculations.
A published article shows that the Schrodinger equation can be used to represent corrections for Newton's equation (21). An article of Wim Vegt entitled 150 years physics based on the wrong equation was published (22). Traditionally, visualizing the wave function for complex systems like two entangled photons has necessitated a technique known as quantum state tomography (23). Chinese uses quantum entanglement to fuel a quantum engine, faster than light (24).

Researchers have developed a method to control the quantum states could enhance quantum computing technologies (25). A work provides further proof the violation of a Leggett-Garg inequality via ideal negative measurements in neutron interferometry (26). Quantization of energy of the particle is a remarkable feature of the quantum mechanics i.e. a particle can have only that permitted energy described by Schrödinger equation together with the potential V and the boundary conditions (27).

A theory shows that the solution to the Schrödinger equation of an initial positron-electron fluctuation includes an exponential function parameter equal to the Planck length (28). Unity of the Universe: New and Global Theory Correlating the Ratio of Hydrogen - Helium to Dark Energy and Matter: Sayed`s Golden Formula (SGF) (29). Scientists have advanced quantum teleportation which could significantly enhance secure quantum communication (30).

Conclusion

This article can be considered a revolutionary approach in quantum mechanics. A measurable Sayed wave function (SQWF) formula was derived and quantified (Ψs) for many elements; (e.g. H, He, Li, Be, B,…...). A new formula called Sayed quantum wavelength (SQW) was also derived. It shows correlation with the principle quantum number, permittivity, elementary charge and atomic number. It may be stated that the derived Sayed quantum wave function equations (STDWFE) are generic and globalized formula to be capable to deals with all atoms. The formulas were verified and more detailed calculations for all the elements of the periodic table are under way.

State of conflict

There is no any conflict of interest with anyone concerning is issue

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*My **Creator** (God), in every moment, in every scientific field and in every tiny spot in your mysterious universe, new discoveries are being obtained. Please grand me the capabilities to understand everything in every field of knowledge to imagine your unbelievable universe and your glory and Greatness.*

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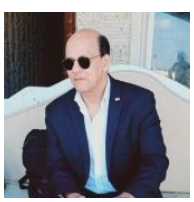
Biography



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