Hypothesis of artificial magnetic monopole wave probability with the help of electric charge in a sphere with the dimensions of the wave amplitude

Ali Haddadpour Abbas Abad
alihadadpour71@gmail.com

Article

Keywords: Sphere, Thickness of an atom, Behavior, Electron

Posted Date: December 8th, 2025

DOI: https://doi.org/10.21203/rs.3.rs-8119259/v1

Additional Declarations: No competing interests reported.

Hypothesis of artificial magnetic monopole wave probability with the help of electric charge in a sphere with the dimensions of the wave amplitude

Mr. Ali Haddadpour Abbas Abad

Independent Researcher, Bachelor of Physics, Mashhad, Iran

alihadadpour71@gmail.com

Abstract

The magnetic field in its normal state in nature is in the form of a closed loop (dipole). In a simple and understandable way, I want to present a theory that a magnetic wave is constructed in the form of an open loop (open path, monopolar).

Many years ago, a scientist named Paul Dirac proposed the existence of a magnetic monopole in the structure of fundamental particles. Scientists have not yet been able to find a natural magnetic monopole. In this article, the intention is to present an artificial magnetic monopole wave with a simple, innovative and conceptual method.

Using 3 simple experiments; the collision of a stone with water and an incandescent lamp, the analyses are performed. The results of the wave (not particle) behavior of these 3 experiments are how the electron movement behaves and the resulting wave is the open path (monopole) magnetic wave.

From a sphere of one atom thickness and a diameter of about 2 manometers of a non-conducting material (carbon, fullerene), an electron with minimum kinetic energy enters at an angle $\hat{\theta} = 0^{\circ}$, moves on the surface of the sphere and exits at an angle $\hat{\theta} = 180^{\circ}$. Finally, the magnetic wave resembles the electric field of a positive charge.

The importance of this issue is that Gauss's law in Maxwell's relations $\vec{\nabla}.\vec{B} = 0$ no longer holds, that is, $\vec{\nabla}.\vec{B} \neq 0$. One of the applications of this piece is the interaction of a magnetic monopole wave with elements of the Standard Model of fundamental particles.

Key words

Sphere, Thickness of an atom, Behavior, Electron

Introduction

In elementary particle physics, the existence of magnetic monopoles was posited by physicist Paul Dirac. This article, however, **does not** aim to investigate or extend the research endeavors of others aligned with Dirac's theoretical framework. Instead, it elucidates a novel and innovative hypothesis[1-4]. This hypothesis explores the magnetic field, demonstrating how a non-rotational magnetic field can be generated through the strategic arrangement of magnetic dipoles. The proposed model asserts that the magnetic field is capable of exhibiting non-rotational behaviors.

This article delineates the operational methodology and accompanying physical analysis. The central hypothesis posited herein is that the passage of a solitary low-energy electron through an atomic sphere results in the radiation of a wave. The amplitude of this radiated wave is hypothesized to be approximately equivalent to the diameter of the sphere, consequently engendering a non-rotational magnetic field.

Figure 1 presents a comprehensive overview of the conceptualization and thought experiment experiences. (Note).

An electric current traversing a conducting wire generates a rotating magnetic field, as described by the right-hand rule. If this wire is subsequently compressed into a sheet, the resulting magnetic field configuration closely resembles that of the original wire. Further, if the sheet is rolled to form a spherical shape, the magnetic field emanating from this sphere continues to exhibit characteristics akin to that of a wire. It is posited that three distinct configurations (wire, sheet, sphere), each with a thickness of a single atom, can be fabricated. In such configurations, the object itself possesses no internal magnetic field; however, the external magnetic field remains rotational, consistent with a dipolar arrangement.

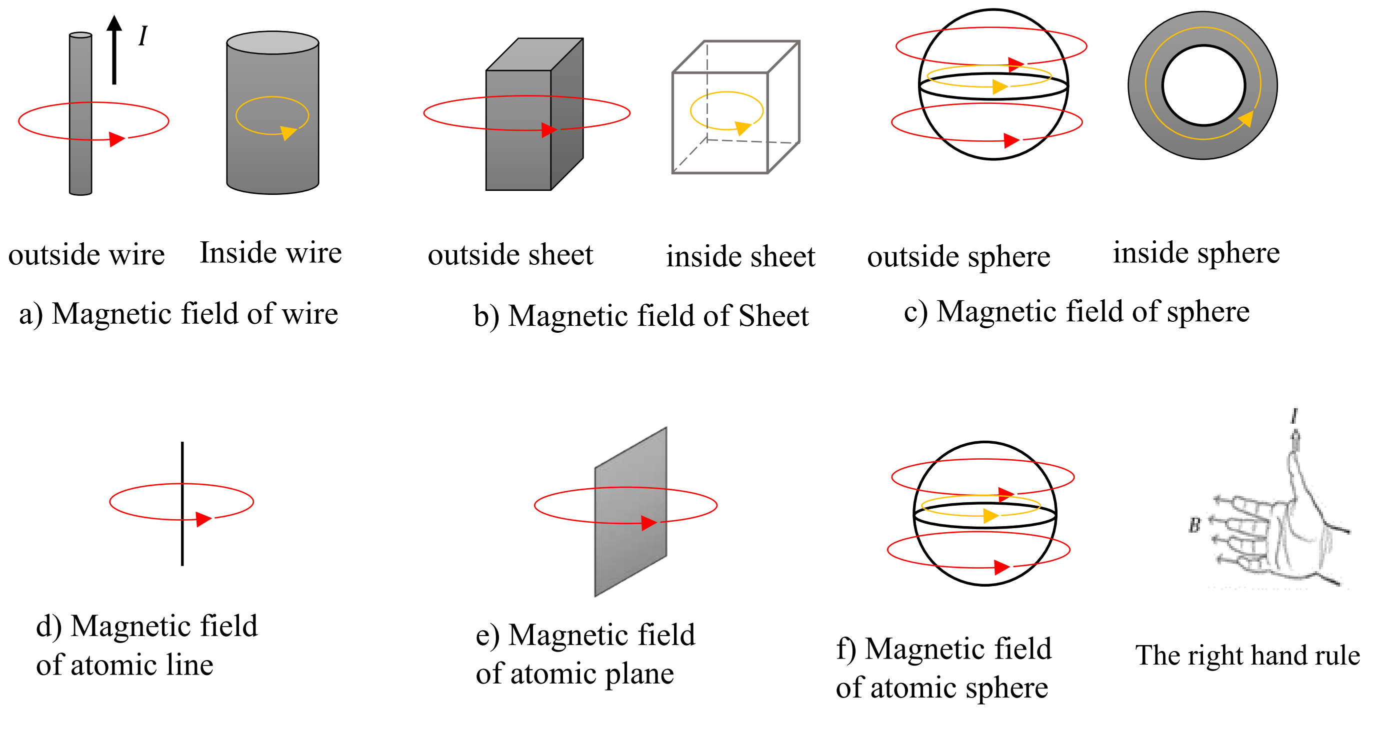


Figure 1- Conceptual Framework of Hypothesis Generation

In the context of **conventional currents**, a moving charged particle induces a surrounding magnetic field. Consequently, a collective flow of such charged particles generates a magnetic field encompassing the entire current stream.

A spherical shell, fabricated from a conductive material, is considered. A uniform current, denoted as I_{int}, enters this shell at its poles ($\hat{\theta} = 0^{\circ}$ and $\hat{\theta} = 180^{\circ}$) subsequently dispersing across the spherical surface before exiting as current I_{out} from the opposing side. The shell possesses a thickness x. Its inner radius is designated as a, while its outer radius is R, and the interior volume remains vacant.

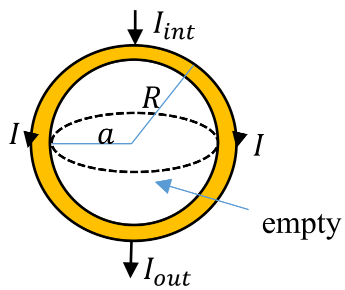


Figure 2- The behavior of the magnetic field within the current-carrying spherical shell

1- The direction of rotation of the magnetic field of the shell

In accordance with the specifications presented in Figure 2, the magnetic field is determined to be as follows.

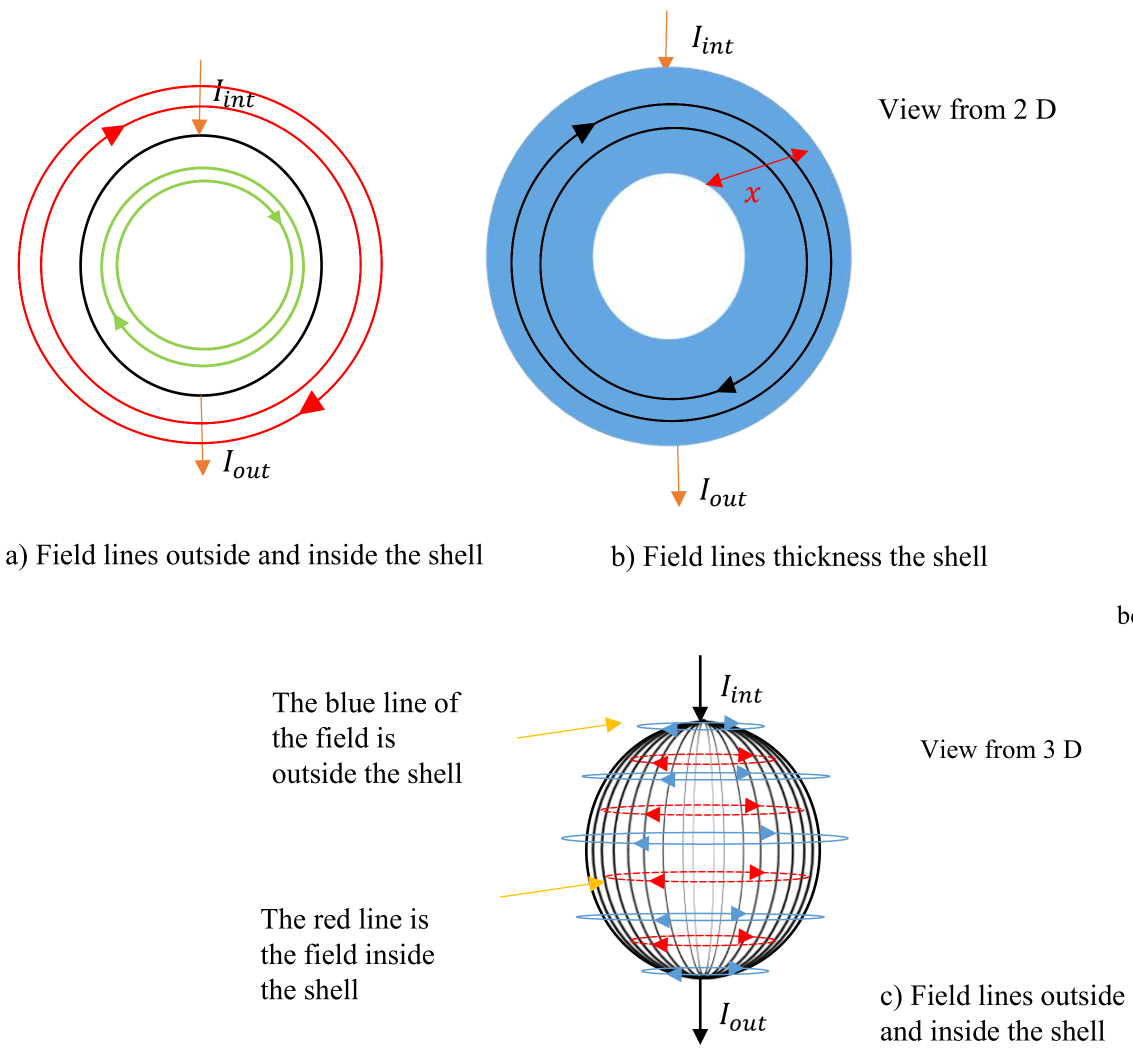


Figure 3- Analysis of field lines B and direction of current I on the shell

Based on the application of the right-hand rule, the magnetic field lines generated by the shell display rotational characteristics in both the external and internal regions.

2- Monopolar philosophical analysis

2.1- Analysis of the magnetic field of a sphere with a thickness of one atom

Consider a rigid and homogeneous sphere, termed an atomic sphere, possessing a thickness of one atom and a radius of r within the nanoscopic range, composed of either a conductive or non-conductive material. Upon the passage of current through this sphere, as depicted in Figure 3, only the external magnetic field (Figure 3-a) is observed. When the thickness, x, is defined as the width of a single atom, the internal volume offers no **space** for rotational motion; consequently, the **internal** field (Figure 3-b) spontaneously vanishes.

During their progression toward a positive potential, electrons **invariably** undergo collisions with atoms, resulting in **random** deflections. In the course of these collisions, electrons experience a reduction in their kinetic energy. Subsequently, due to the persistent electric field, they are re-accelerated towards the positive potential, thereby recovering their kinetic energy. Electric charge moves on the surface of the conductor.

Electric charge moves on the surface of the conductor.

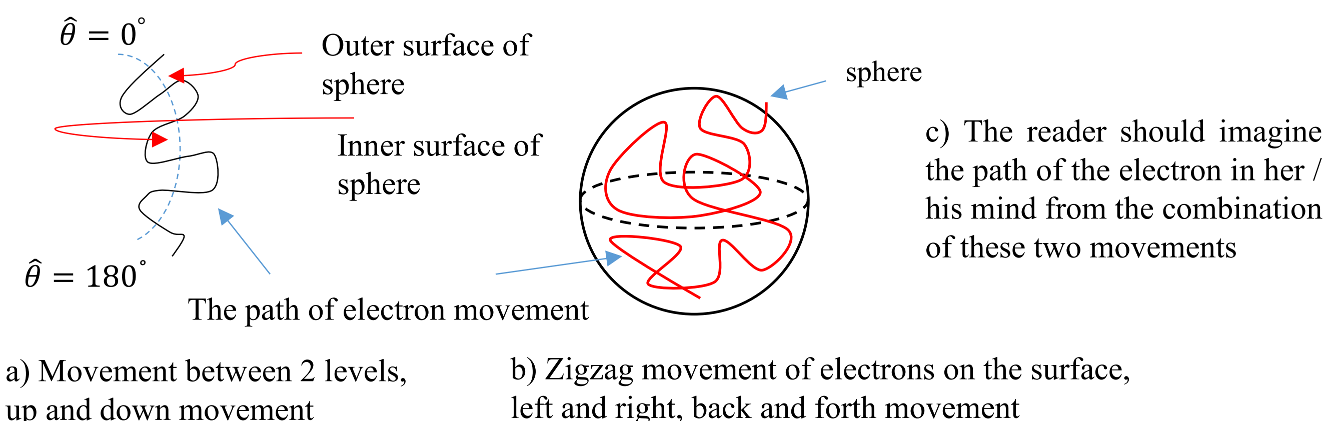


Figure 4- Simulation of Electron Trajectories within the Sphere

In Figure 4-a-b, distinct kinetic behaviors of the conduction electron are illustrated. The reader is directed to consider Figure 4-c in conjunction with the subsequent textual analysis.

Figure 5 presents three analyses regarding the electron's kinetic energy. Electrons enter with maximal kinetic energy, approaching their bond energy, under the influence of a maximal external electric field. Consequently, such high-energy electrons tend to **traverse** directly from the entry point ($\hat{\theta} = 0^{\circ}$) to the exit point $\hat{\theta} = 180^{\circ}$, bypassing the sphere's surface. That is, a stream of high-energy electrons effectively passes through the center. This direct transit, occurring due to the relatively low potential at the entry point and maximal potential at the exit point, coupled with an unimpeded path along the sphere's diameter, represents a "**jump**" phenomenon (indicative of negligible electrical resistance, akin to an electric spark). This central electron trajectory generates a **potent** rotational magnetic field, consistent with the right-hand rule. This centrally originating field induces a coherent collective motion among the surface electrons, cooperatively establishing a uniformly rotating magnetic field. The magnetic field originates from the center and propagates outward from the sphere. Conversely, electrons lacking the requisite energy for direct traversal propagate along the sphere's **surface**. Under conditions of an **average** electric field, electrons are unable to execute a direct "jump" but may detach from the surface. When the electric field is **minimal**, electrons are confined to motion within the conduction band. Ultimately, Figure 3-a is reconstructed to account for these three distinct cases. Figure 5 has been analyzed from the perspective of fundamental particle physics.

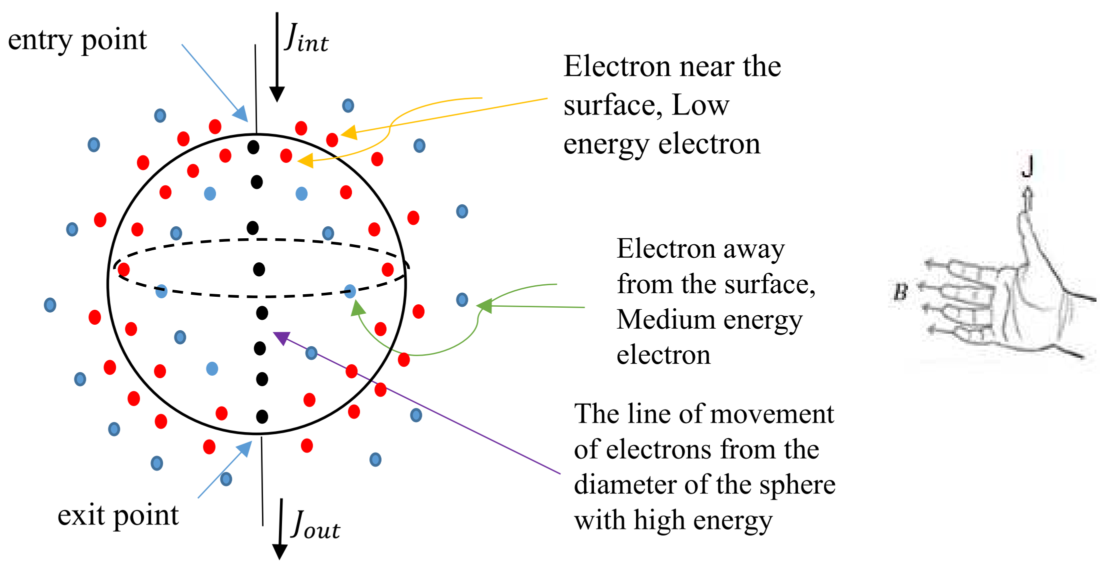


Figure 5- Analysis of the External Electric Field's Influence on Electron Behavior

When the electric charge density J within the sphere is elevated, the electrons exhibit collective behavior, with each electron generating an individual magnetic field. The aggregate magnetic field consequently propagates around the sphere. Specifically, the first electron contributes to the B_1 field, the second to the B_2 field, and so forth. According to the principle of superposition, the total field is equal to:

$$B_T = B_1 + B_2 + \cdots = \sum_{i=1}^{n} B_i$$

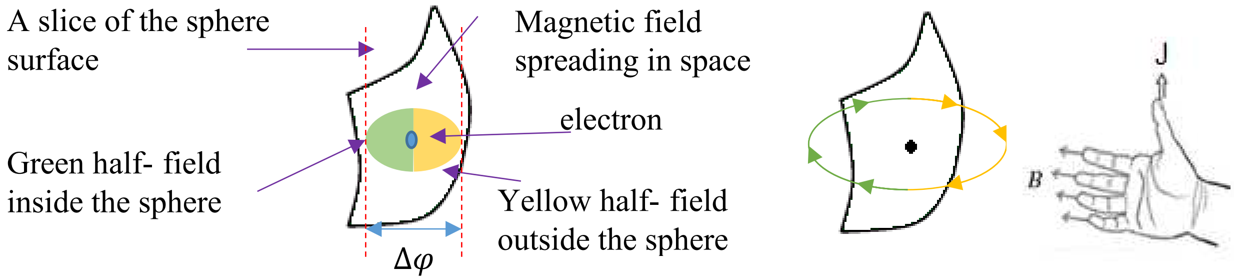
The passage of a **solitary** electron, possessing minimal energy, through the sphere induces a change in the magnetic field. This implies that the sphere's **incremental charge** is consistently attributed to a single electron. As depicted in Figure 5, this electron is confined to the conduction band. Given its **minimal energy and isolated state**, the magnetic field generated by this electron is spatially restricted and unable to propagate across the entire surface of the sphere, meaning it does not extend from $\hat{\varphi} = 0^{\circ}$ to $\hat{\varphi} = 360^{\circ}$. Consequently, the influence of this electron's field is limited to its immediate vicinity, denoted as Δφ. The movement within this Δφ region conforms to the pattern illustrated in Figure 4-b.

Regarding the electron's movement pattern: the initial electron enters at a designated entry point, traverses the sphere's surface, and subsequently exits. A subsequent electron is permitted to enter only after the preceding electron has departed from the exit point.

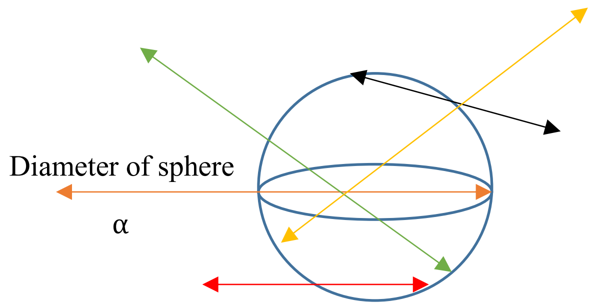
The concept of electron excitability is a property applicable to a collective set of charges, not to an individual electron. Furthermore, within a solid, electron movement is characterized by a defined range **or** band of permissible energies. This is due to the overlapping wave functions of electrons from adjacent atoms, preventing an electron from being localized to a single, specific atom.

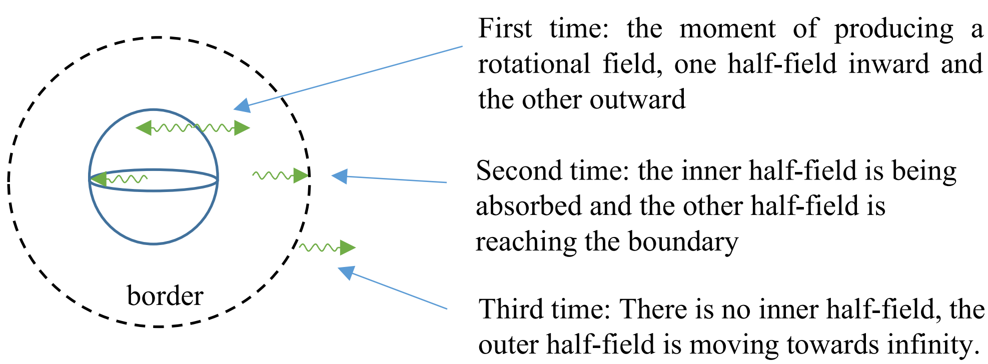
Within the sphere, when an electron is elevated to the conduction band through the application of electric field energy, its motion conforms to the pattern illustrated in Figure 4-b; simultaneously, it is constrained from free-flight. When an electron occupies the conduction band, electrical conduction (i.e., electric current) occurs, and the moving electron generates a magnetic field. During its transit, this electron will inevitably collide with neighboring atoms. Conversely, when an electron resides in the valence band, electrical conduction does not occur because it is subject to the effective force of the nucleus, rendering it unable to produce a magnetic field.

As illustrated in Figure 4-b, the magnetic wave (field) exhibits a completely **irregular** radiation pattern synchronous with the electron's movement. These fields, possessing an amplitude of Δφ, propagate both internally and externally to the sphere, as depicted in Figure 6-a. The fields propagating within the sphere undergo collisions with other atoms. According to Figure 6-b, the trajectory of these fields, dependent on the angle of incidence α, ranges from the minimal distance between neighboring atoms to the maximum span of the sphere's diameter. Due to the low energy of the field, the collision energy is insufficient to transfer a valence band electron to the conduction band, thus precluding electrical conduction. Subsequent to these collisions, these low-energy fields induce a phonon effect in the interacting atoms, which may manifest as heat. Finally, as shown in Figure 6-c, the portion of the field internal to the sphere is ultimately absorbed by the sphere, whereas the external component of the wave continues its propagation unimpeded due to the absence of **obstructions** in its path.

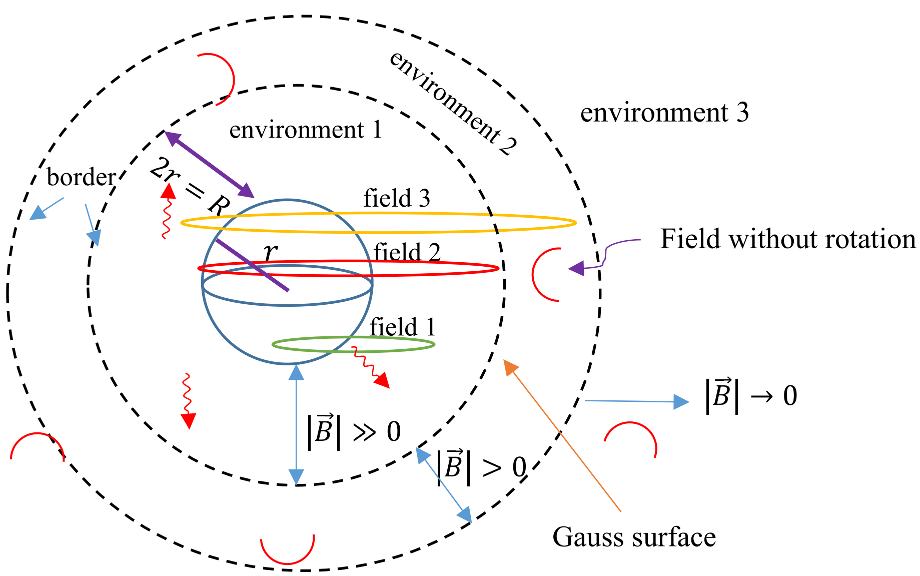


a) Intuitive representation of the magnetic field of an electron





c) Time and motion analysis of a field



d) Analysis of 3 fields produced by electrons

Figure 6- Analysis of how to create a field without rotation

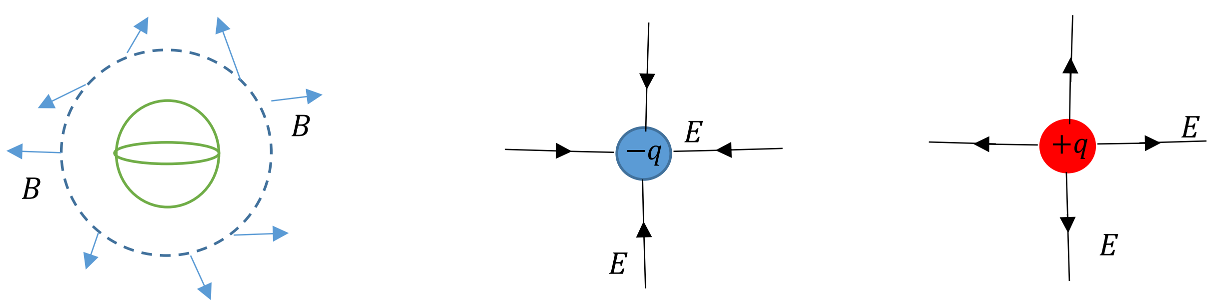
Definition: A field is defined as a region of space capable of exerting a force on a particle. From a physical analysis perspective, the magnitude of a magnetic field is inversely proportional to distance, specifically related as $\left(|\vec{B}| \propto \frac{1}{R}\right)$. An electromagnetic wave is formed by the combination of mutually perpendicular electric and magnetic fields. When an electromagnetic wave is emitted from a source, it propagates indefinitely into space, provided there are no obstacles in its path (as detailed in the Conclusion section, paragraph 5). Figure 6-d illustrates three distinct perimeters and three corresponding fields originating externally to the sphere.

In Environment 1, as depicted in Figure 6-b, Field 1 is generated under the condition of $\alpha < \pi$, characteristic of non-rotating fields. Conversely, Environment 1 also contains Field 2 and Field 3, both of which are rotating. Within this environment, the magnitude of the field is substantial, making the separation of these fields particularly challenging. Specifically, Field 2 is associated with an angle of $\alpha = \pi$, while Field 3 is characterized by high energy and an arbitrary angle.

In Environment 2, there is a high probability of encountering non-periodic fields, while the presence of periodic fields is low. The field strength in this environment is appropriate for conducting the experiment. The observed presence of wave 3 is attributed to the high kinetic energy of the electron at its entry point. As the electron progresses towards the exit point, its energy diminishes due to the specific electrical resistance ρ, leading to the emergence of irrotational fields within the angular range of $\frac{\pi}{4} < \theta < \pi$.

Within Environment 3, irrotational fields are present, although their detection poses significant challenges. In this particular region, it can be asserted that $\vec{\nabla}.\vec{B} \not\approx 0$.

Figure 7 presents a comparative analysis with a static charged particle q.



c) The direction of the magnetic field lines of the sphere

b) Direction of electric field lines of negative charged

a) Direction of electric field lines of positive charged

Figure 7- A comparative analysis of the magnetic field lines generated by an atomic sphere and the electric field lines of an electric charge.

Positive electric charges q^+ are associated with electric field lines that radiate outwards, while negative electric charges q^- are associated with electric field lines that converge radially inwards.

Electric field lines are depicted as straight. Within the sphere, the outward trajectory of the magnetic field in Environment 2, as presented in Figure 6-d, exhibits a similarity to Figure 7-a.

3. Monopole Logical Analysis

3.1. Mathematical Calculations

The requisite relationship for calculating the magnetic field of the sphere differs due to considerations of its dimensions and inherent computational limitations.

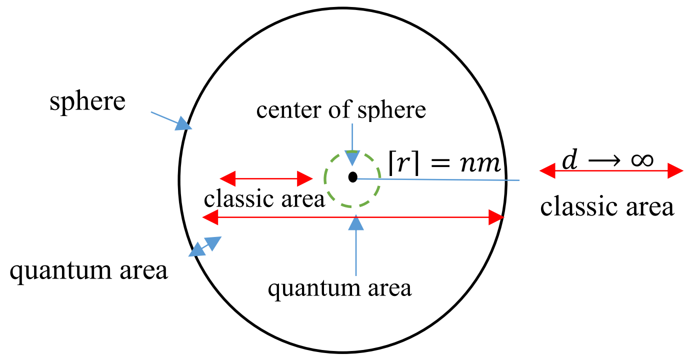


Figure 8- Dimensional check for sphere calculation type

Analysis of Figure 8 indicates that both the outer and inner environments, as well as the surface and central regions, are within the classical range, whereas the environment is characterized by quantum behavior. As per Figure 8, the moving electron exhibits quantum behavior, implying that Figure 4 is interpreted through quantum mechanical calculations. Conversely, the electron's motion generates a magnetic field, as illustrated in Figure 1. According to Figure 8, this magnetic field falls within the classical regime when it propagates through space. Consequently, its analysis can be readily performed using classical electromagnetism.

In Figure 6, the electron is capable of emitting either discrete or continuous fields, irrespective of the type of movement shown in Figure 4. It is noteworthy that these undesirable fields (by human design) were confined to spatial limits where mutual interaction is precluded.

The radius of the sphere must be constrained; it cannot be smaller than the nanometer scale nor larger than the micrometer scale. Atoms smaller than nanometers are excessively compact, hindering molecular structure formation. Conversely, a radius exceeding one micrometer is unfeasible as atomic bonds are insufficient to maintain the integrity of the structure, leading to structural collapse and the appearance of a dense mass.

3.2. Radius of sphere

A photon constitutes an electromagnetic wave, composed of co-propagating electric and magnetic fields. Assuming the moving electron possesses only one radiation, a complete $[0,2\pi]$ period of a sin or cos wave comprises two peaks. The difference between sin and cos is considered to be $\frac{\pi}{2}$.

sin. Within $[0, \pi]$, there exists a wave crest. The amplitude of the wave A represents the diameter of the sphere $(A = D = 2r)$The internal space of the sphere must be smaller than $\frac{\lambda}{4}$. $D < \frac{\lambda}{4}$

The radius of the sphere cannot be smaller than the nanometer scale nor larger than the micrometer scale. Atoms smaller than nanometers are excessively compact, hindering molecular structure formation. Conversely, a radius exceeding one micrometer is unfeasible as atomic bonds are insufficient to maintain the integrity of the structure, leading to structural collapse and the appearance of a dense mass.

3.3- Quantum calculations

3.3.1- Analysis of Figure 4

In quantum mechanics, according to measurement analysis, the probability density distribution function at an initial time t_0 is unity at location x_0. In a subsequent measurement t_1, the probability density distribution function is unity solely at x_0 and zero elsewhere. However, in subsequent measurements (time t_2), the probability density distribution function becomes unity when the electron is observed at other locations (place x_1).

3.3.2- Meaning of Δφ

As per Figure 16 and Wikipedia, the average diameter of carbon nanotubes ranges from 0.5 to 2 nm. The circumference is therefore calculated as:

$$P_1 = 2\pi r = 2 \times 3.14 \times (1 \times 10^{-9}) = 6.28 \times 10^{-9} \cong 10^{-9}\, m$$

$$P_2 = 2 \times 3.14 \times (0.25 \times 10^{-9}) = 1.57 \times 10^{-9} \cong 10^{-9}\, m$$

Additionally, according to Wikipedia, the electron radius is $r_e = 10^{-22}\, m$ .The ratio of the sphere circumference to the electron circumference is consequently:

$$P_e = 2 \times 3.14 \times 10^{-22} = 6.28 \times 10^{-22} \cong 10^{-22}\, m \qquad \frac{P_1 = P_2}{P_e} = \frac{10^{-9}}{10^{-22}} = 10^{13}$$

Furthermore, according to conventional understanding, the electron is expected to move exclusively within the conduction band. A quantum mechanical illustration of this principle is the motion of a particle within a finite square potential well. When the particle is at the edge of the well, it signifies that the particle is on the verge of transitioning from the valence band to the conduction band $(E_k \cong V)$. Electrical conduction commences once the electron is situated in the conduction band $(E_k + \Delta E_k > V)$, where its movement is governed by its wave function. Consequently, the energy of the particle is equivalent to the energy of its wave function, which depends on the probability density distribution function. Therefore, it is impossible for the wave function's energy to encompass the entire environment P_1 or P_2.

Is someone screaming at the North Pole? Is his voice heard in the South Pole? No.

3.4- Classical calculations

The field generation source is an electron. This field is produced from a source with frequency ν and amplitude A. A fountain can generate either a single field or a continuous flow of fields. Due to the random motion of the electron, the generated field (whether flux or a single field) is not localized at a specific point.

3.4.1- Analysis of division of the magnetic field

Experiment 1: stone and water container

Figure 9 illustrates the experimental setup. The water container exhibits an oval and circular geometry, with these two sections joined at an interface. The interface is presumed to be a wooden blade. This wooden blade rests on the water's surface and remains stationary. From a sand container, small pebbles are released to fall directly into the opening in the wood, thereby generating circular waves on the water's surface. The angle of impact of the falling rock onto the water surface is **perpendicular**. This experiment proceeds in two stages: Level 1 corresponds to wave 1 and represents the interior of the sphere, while Level 2 corresponds to wave 2 and represents the exterior of the sphere.

In this experiment, the specific type of wave generator (whether a stone or a human finger) is irrelevant. The focus of the analysis is the wave behavior itself, which is considerably more significant than the source of wave generation.

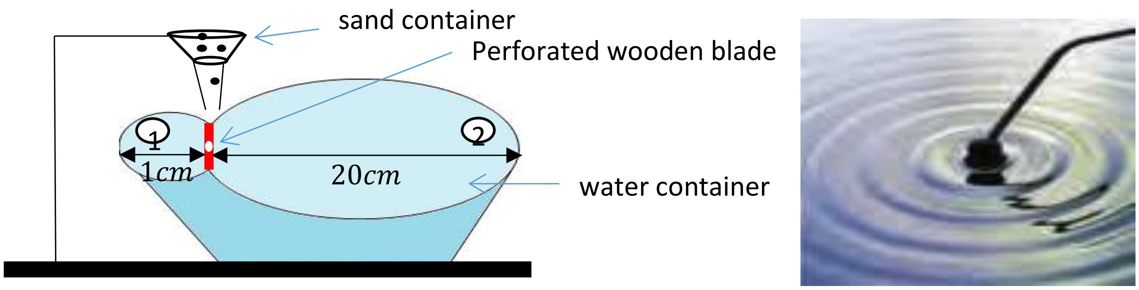


Figure 9- Intuitive display of the test device

Step 1 - Figure 10: From the sand container, a single stone impacts the water surface through the wooden opening. A **single wave**, composed of waves 1 and 2, is generated. Wave 1 experiences significantly greater damping than wave 2 due to spatial limitations (collisions with the container wall and the wooden blade), whereas wave 2 expands owing to its larger available space for movement.

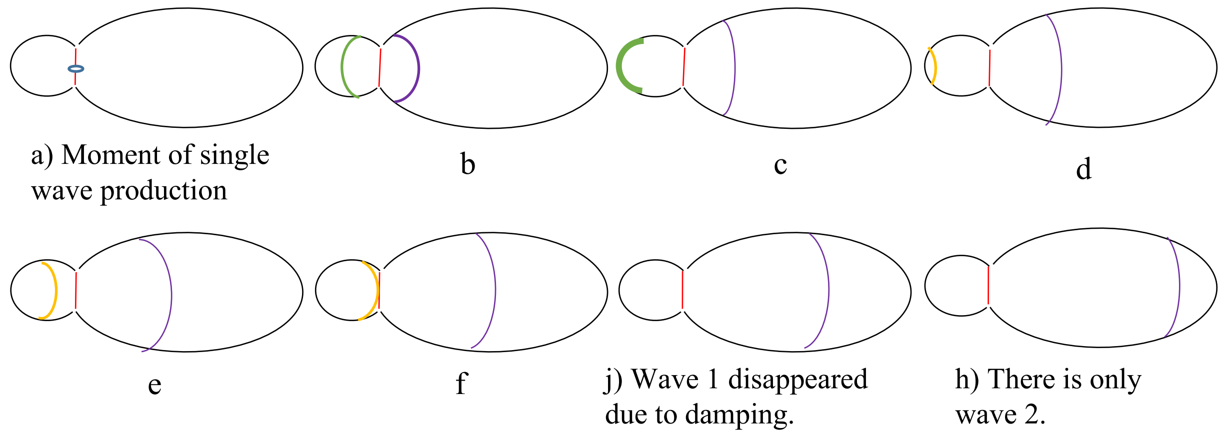


Figure 10- Single wave analysis over time

Figure 10 demonstrates that the electron exhibits discrete radiation.

Step 2 - Figure 11: From the sand container, multiple stones are simultaneously released to strike the water surface through the wooden opening, generating **continuous** waves 1 and 2. Wave 1 experiences significantly more rapid damping than wave 2. This accelerated damping is attributed to spatial confinement (collisions with the container wall and the wooden blade) as well as destructive interferences arising from face-to-face collisions. Conversely, wave 2 expands due to the ample space available for its propagation.

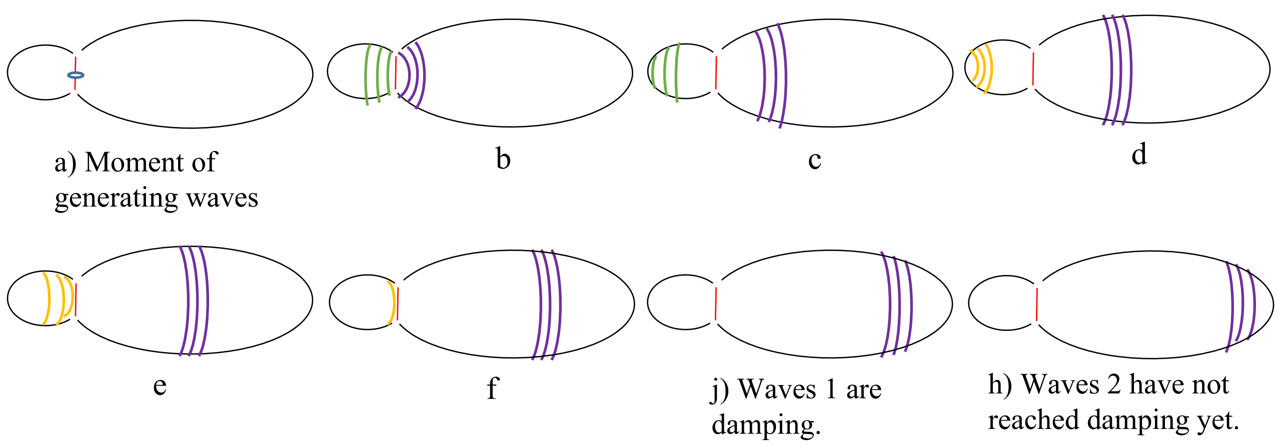


Figure 11- Analysis of waves over time

Figure 11 indicates that the electron generates continuous radiation.

Field analysis, both internal and external to the sphere, must be conducted separately.

3.4.1.1- Intra-sphere field analysis

A single field initially impacts the atomic layer unimpeded. However, the field flux subsequently interacts before reaching the atomic layer. Owing to the limited spatial extent of the wave movement, the spherical wave originating from the source is unable to fully flatten. For a single field mode, the wave equation is given by $\vec{B}(\vec{r},t) = \frac{1}{|\vec{r}|} B_0 \exp i(\omega t \pm kr + \phi_0)$. In the case of field flux, the sole parameter that changes is the initial phase ϕ_0 of the wave, while other parameters ω, k, A remain constant.

For calculation purposes concerning wave groups, two wave types are analyzed, and their resultant interference patterns are presented. There are two primary categories of wave interference: (1) Constructive interference, which occurs without angular or phase differences, and (2) Destructive interference, which involves angular or phase differences. This investigation focuses exclusively on the two interference modes exhibiting the highest and lowest impact on the wave, with other cases remaining unexplored.

Given the exceedingly small surface area of the sphere (on the order of nanometers) through which an electron navigates, the minute variations in the electron's motion frequency, which influence the radiation wave's frequency, are disregarded.

The problem conditions are defined by: (1) a constant frequency, and (2) a spherical segment geometry resulting from symmetry.

Considering the conditions of the problem and the phase changes, it can be asserted that:

$$\vec{B}(\vec{r},t) = \frac{1}{|\vec{r}|} B_0 e^{i(\omega t \pm kr + \phi_0)} \quad , \begin{cases} \varphi_1 = \omega t_1 \\ \varphi_2 = \omega t_2 \end{cases} \rightarrow \Delta\varphi = \omega(t_2 - t_1) = \omega \Delta t$$

$\Delta\varphi$ is the motion phase (time phase) which is constant due to the constant frequency of $\Delta\varphi$ value. For convenience, the constant value ωt is omitted from the calculations.

Here, $\Delta\varphi$ represents the motion phase (time phase), which remains constant due to the constant frequency of $\Delta\varphi$ For convenience in calculations, the constant term ωt is omitted.

Constructive interference: two waves (field) in phase

$$\vec{B}(\vec{r},t) = \frac{1}{|\vec{r}|} B_0 e^{i(\omega t \pm kr + \phi_0)} \longrightarrow \begin{cases} \phi_0 = 0 \\ \omega t = 0 \\ r \longrightarrow +r \end{cases} \Longrightarrow \vec{B}_1(\vec{r}) = \vec{B}_2(\vec{r}) = \frac{1}{|\vec{r}|} B_0 e^{i(kr)}$$

$$B_T = B_1 + B_2 = \frac{1}{|\vec{r}|} B_0 e^{i(kr)} + \frac{1}{|\vec{r}|} B_0 e^{i(kr)} = 2\frac{1}{|\vec{r}|} B_0 e^{i(kr)} = 2B_1$$

$$\vec{B}_T(\vec{r},t) = \frac{2}{|\vec{r}|} B_0 e^{i(\omega t \pm kr)}$$

Destructive interference: two waves (field) in opposite phase

$$\vec{B}(\vec{r},t) = \frac{1}{|\vec{r}|} B_0 e^{i(\omega t \pm kr + \phi_0)} \longrightarrow \begin{cases} \phi_0 = 0, \pi \\ \omega t = 0 \\ r \longrightarrow +r \end{cases} \Longrightarrow \begin{cases} \vec{B}_1(\vec{r}) = \frac{1}{|\vec{r}|} B_0 e^{i(kr)} \\ \vec{B}_2(\vec{r}) = \frac{1}{|\vec{r}|} B_0 e^{i(kr+\pi)} \end{cases}$$

$$B_T = B_1 + B_2 = \frac{1}{|\vec{r}|}B_0 e^{i(kr)} + \frac{1}{|\vec{r}|}B_0 e^{i(kr+\pi)} = \frac{1}{|\vec{r}|}B_0\left(e^{i(kr)} + e^{i(kr+\pi)}\right) = \frac{1}{|\vec{r}|}B_0 \times 0 = 0$$

Law of conservation of energy**:** The motion of an electron on a spherical surface contributes to two phenomena: (1) Electromagnetic field production, and (2) Continuous electron movement.

$$E_{T_{int}} = E_{k_{int}} = u + E'_k \Longrightarrow u_B < E_{k_{int}} \qquad , \qquad u = u_E + u_B$$

A portion of the electron's kinetic energy, $E_{k_{int}}$, is utilized to generate the magnetic energy density u_B. This field, represented by $\vec{B}_T(\vec{r},t)$ possesses a magnetic energy density u_B and subsequently interacts with the atomic layer. Four distinct interaction modes for this field are identified: (1) The layer absorbs the field, (2) The layer reflects the field, (3) A portion of the field is absorbed, and (4) The field completely passes through the atomic layer.

Mode 1: This is considered the optimal mode. The material of the layer must entirely convert the absorbed energy into vibrational (phonon) energy. If the layer instead converts the absorbed energy into thermal electromagnetic radiation, it will induce distortion and disorder within the environment, as illustrated in Figure 19.

Mode 2: This represents the least desirable mode. The field energy becomes trapped within the sphere. Furthermore, upon the entry of subsequent electrons, energy is continually added moment by moment inside the sphere. Ultimately, the accumulating electromagnetic mass exerts electromagnetic pressure on the bonding energy of the atomic network, leading to the explosion or destruction of the sphere.

Mode 3: This mode is an intermediate state between Mode 1 and Mode 2 and is not recommended for practical application.

Mode 4: This is the worst mode, implying that the magnetic monopole is not formed (refer to Figure 6-d, field 3, gamma ray hitting the paper).

3.4.1.2- Analysis of the outer sphere field

The single field or field flux propagates into medium 2 without interference due to the extensive space available for its movement.

For the purpose of simplifying calculations, three primary **assumptions** are considered:

1. The electron possesses the highest kinetic energy at the entry point and the lowest kinetic energy at the exit point. Given the small radius of the sphere, it can be assumed that the electron moves within the conduction band without a reduction in energy. The electron is treated as a classical particle.

2. Environments 1 and 2, despite being on a nanoscale, are considered to behave classically.

3. The field produced by the electron's movement passes exclusively through the center ($\alpha = \pi$)

The motion of electrons on the surface of a sphere results in centripetal acceleration due to the changing direction of movement. This accelerated motion generates a magnetic field.

Using Gauss's law: Electron is a charged particle. At rest, its electric field is constant. Based on spherical symmetry, the Gaussian surface is a sphere. The electric field starts from the surface of the sphere and the radius of the Gaussian sphere is R. $R = 2r$

$$\Phi_D = q_{enc} \quad \Phi_D = \oiint_s \vec{D}.d\vec{A} \Rightarrow \Phi_E = \oiint \varepsilon_\circ \vec{E}.d\vec{A} = q_{enc} \qquad \vec{D} = \varepsilon_\circ \vec{E}$$

$$\Phi_E = \oiint \vec{E}.d\vec{A} = \frac{q_{enc}}{\varepsilon_\circ}$$

A magnetic field without rotation is observed at a distance R. In this scenario, a sphere with a radius of $3r$ is present, but the field generation source is located on the surface of this sphere. The region of the magnetic field without rotation ends at distance R, which marks the beginning of environment 2.

Electric charge is defined as the cause of a magnetic field. This field propagates towards infinity in environment 2. Consequently, for environments 2 and 3, the magnetic flux is directly proportional to the electric charge, such that $\Phi_B \propto q_{enc}$.

According to assumption number 1, B is uniform and leaves the integral.

$$\Phi_H = q_{enc} \qquad \Phi_H = \oiint_s \vec{H}.d\vec{A} \Rightarrow \Phi_B = \oiint \frac{\vec{B}}{\mu_\circ}.d\vec{A} = q_{enc} \qquad \vec{H} = \frac{\vec{B}}{\mu_\circ}$$

$$\Phi_B = \oiint \vec{B}.d\vec{A} = \mu_\circ q_{enc} = \mu_\circ e \Rightarrow \int BdA\cos 0 = \int BdA \Rightarrow B(4\pi R^2) = 16B\pi r^2 = \mu_\circ e$$

$$B = \frac{\mu_\circ e}{16\pi r^2} = \frac{1}{r^2}\frac{1.26 \times 10^{-6} \times 1.6 \times 10^{-19}}{16 \times 3.14} \cong 4 \times 10^{-27}\frac{1}{r^2}$$

According to the diameter of carbon nanotubes:

$$B = 4 \times 10^{-27} \times \frac{1}{(0.25 \times 10^{-9})^2} = 64 \times 10^{-9}\ \frac{A}{m} = 64\, n\frac{A}{m}$$

$$B = 4 \times 10^{-27} \times \frac{1}{(0.5 \times 10^{-9})^2} = 16 \times 10^{-9}\ \frac{A}{m} = 16\, n\frac{A}{m}$$

$$B = 4 \times 10^{-27} \times \frac{1}{(0.75 \times 10^{-9})^2} = 7.1 \times 10^{-9}\ \frac{A}{m} = 7.1\, n\frac{A}{m}$$

$$B = 4 \times 10^{-27} \times \frac{1}{(1 \times 10^{-9})^2} = 4 \times 10^{-9}\ \frac{A}{m} = 4\,n\frac{A}{m}$$

Approximate values indicate an inverse relationship between the radius of the sphere r and the magnitude of the magnetic field B. The presence of an electron causes a **scattering** ratio, which amplifies the field's increases with the expanding surface area of the sphere.

3.4.1.3- The difference in the size of the magnetic field outside and inside the sphere

Inside the sphere due to the limitation of space, there is field constructive interference and outside the sphere there is field dispersion due to the expansion of space. (single field $|B_{int}| = |B_{out}|$ and field flux $|B_{int}| > |B_{out}|$)

Circular water waves and magnetic fields share similarities and differences. Both propagate in a specific direction, but the magnetic field also rotates. The water and stone test suggests that a portion of the magnetic flux **can be** eliminated; however, it provides no information about the rotational motion of the magnetic field.

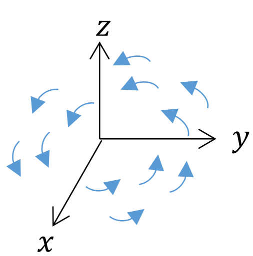
3.4.2- Magnetic field rotation analysis

A dipole magnetic field is inherently rotational, and its energy rotates. While a part of the field's energy is removed, the remaining energy continues to propagate with the passage of time in the direction of half-cycle propagation. According to the uncertainty principle, this is expressed as $(\Delta E)(\Delta t) \geq \frac{h}{4\pi}$

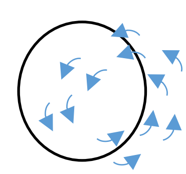
The diameter of the sphere is smaller than the amplitude of the wave $(D < A)$ Furthermore, the magnetic field is in the form of $\vec{\nabla} \times \vec{B} \neq 0$ (vortex), and the wave equation is given by $B(x,t) = A\sin(\omega t - kx)$.

Figure 12-a-b-c-d are combined with the passage of time. Time $t_0 = 0$ is the birth moment of the field. t_1 wave of $\frac{\lambda}{8}$ has been produced. t_2 of the field is produced as $\frac{\lambda}{4}$ and this time is the moment of death of the field inside the sphere. t_3 The outside field has moved away from the surface of the sphere. t_4 the field continues to propagate with its half cycle.

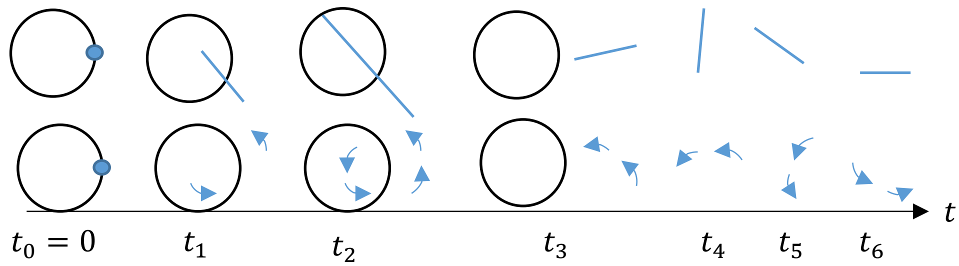
a- Wave function drawing



b- $\vec{\nabla} \times \vec{B}$



d- Drawing of the field rotation on the sphere



e- The combination of the above 4 shapes over time

Figure 12- Intuitive representation of waveform probability

Figure 12-a: From $\left[0,\frac{\lambda}{4}\right)$ then $\vec{\nabla}\times\vec{B}$ is increasing and at $\frac{\lambda}{4}$ its size is maximum, from $\left[\frac{\lambda}{4},\frac{\lambda}{2}\right)$ then $\vec{\nabla}\times\vec{B}$ is decreasing and at $\frac{\lambda}{2}$, its size is minimum. of $\left(\frac{\lambda}{2},\lambda\right]$ is the inverse of $\left[0,\frac{\lambda}{2}\right)$.

For a wave, potential energy peaks at the amplitudes and is minimal at the equilibrium point. Conversely, kinetic energy is minimal at the amplitudes and maximal at the equilibrium point.

To simplify calculations, it is assumed that the electron emits only one wave during its passage through the sphere, extending the problem to account for a flux of radiations. For clarity, the magnetic field is analyzed first, followed by the electric field.

According to Figure 12-e, first the magnetic field $\vec{B}(\vec{r},t)=\vec{B}(r,\theta,\varphi,t)$ is produced. For simplicity, the coordinate system has been transferred from spherical to Cartesian to simplify the concepts. $\left(\vec{B}(r,\theta,\varphi,t)\to\vec{B}(x,y,z,t)\right)$ is transferred to the spherical coordinate system after the analysis. $\left(\vec{B}(x,y,z,t)\to\vec{B}(r,\theta,\varphi,t)\right)$ This work is called playing with math.

$$\vec{B}(\vec{r},t)=\vec{h}(\vec{r})g(t)=\vec{h}(x,y,z)g(t)=\left(h(x)\hat{\imath}+h(y)\hat{\jmath}+h(z)\hat{k}\right)g(t)$$

$$\vec{B}(\vec{r},t)=B_0exp(\omega t\mp(k(x)x+k(y)y+k(z)z)+\varphi_0)$$

Since there is a field and it is born from the source, the value of $\varphi_0=0$.

$$\vec{B}_{int}(\vec{r},t)=B_0exp\left(\omega t-\left(k_xx+k_yy+k_zz\right)\right)=B_0exp(\omega t)exp\left(-\left(k_xx+k_yy+k_zz\right)\right)$$

$$\vec{B}_{out}(\vec{r},t)=B_0exp\left(\omega t+\left(k_xx+k_yy+k_zz\right)\right)=B_0exp(\omega t)exp\left(k_xx+k_yy+k_zz\right)$$

Inside the sphere, calculations are performed to determine the complete absorption (collision of a wave with matter). Complete absorption signifies that the electromagnetic energy density is converted into phonon energy.

$$u_{phonon}=u=u_E+u_B=\frac{1}{2}\varepsilon_0E^2+\frac{B^2}{2\mu_0}$$

Outside the globe, the calculations related to the era are done. There are 8 modes for era.

1) $[k_x, k_y, k_z] \neq 0$ 2) $[k_x, k_y, k_z] = 0$ $\omega = 2\pi\nu = \text{const}$

3) $\begin{cases}[k_x, k_y] = 0 \\ k_z \neq 0\end{cases}$ 4) $\begin{cases}[k_x, k_z] = 0 \\ k_y \neq 0\end{cases}$ 5) $\begin{cases}[k_y, k_z] = 0 \\ k_x \neq 0\end{cases}$

6) $\begin{cases}k_x = 0 \\ [k_y, k_z] \neq 0\end{cases}$ 7) $\begin{cases}k_y = 0 \\ [k_x, k_z] \neq 0\end{cases}$ 8) $\begin{cases}k_z = 0 \\ [k_x, k_y] \neq 0\end{cases}$

Analysis of the stone and water container experiment indicates that a portion of the field was dissipated, while the remainder stayed intact. Specifically, 50% of the field is located on the right side, and the other 50% on the left side.

Mode 1 demonstrates the full curl of the field. However, experimental results confirm that part of the field is destroyed, leading to Mode 1 rejection.

In Mode 2, the stone did not make contact with the water, thus no field was generated, resulting in Mode 2 rejection.

Modes 3,4,5- 70% of the field is destroyed and 30% remains healthy. Damage is more than health. It is assumed that the field is generated at the coordinates $\left(\hat{\theta} = \frac{\pi}{2}, \hat{\varphi} = 0\right)$ on the surface of the sphere and moves in the direction of the diameter. In coordinates $\left(\hat{\theta} = \frac{\pi}{2}, \hat{\varphi} = \pi\right)$ internal degradation and at distance R half field reached environment 2. The distance between these two fields is $4r$. How a half field that has no energy wants to destroy another half field. These 3 rejection modes.

In Modes 6, 7, and 8, 30% of the field is destroyed, while 70% remains intact, signifying more preservation than damage. The outer half-field possesses energy, enabling it to continue movement (propagation) at the moment of destruction of the inner half-field. However, the **connection** is disrupted, resulting in an incomplete curl (rotation around 3 axes) or an incomplete curl (rotation around 2 or 1 axis). These three modes are deemed acceptable. The probability of occurrence of these three situations is equal, and they bear no reference to each other. For the correctness of these three modes, the following test answers are provided.

Experiment 2: Stone and pond test[5]

An individual stands by a pond, holding a flat stone. The stone is thrown at an **angle** to the water's surface, causing it to strike the water several times before sinking. Assuming the stone hits the water three times, the direction of the stone's movement dictates the direction of wave propagation. This, in turn, influences the force exerted by the stone. The chosen angle and direction of motion result in semicircular waves. Due to the **large** propagation space within the pond, the waves do not possess the necessary **time** to complete a semi-circle to a full circle, and the available space prevents the waves from transitioning from a semi-circular to a stationary state.

Figure 13 illustrates 3 waves in 3 distinct time intervals.

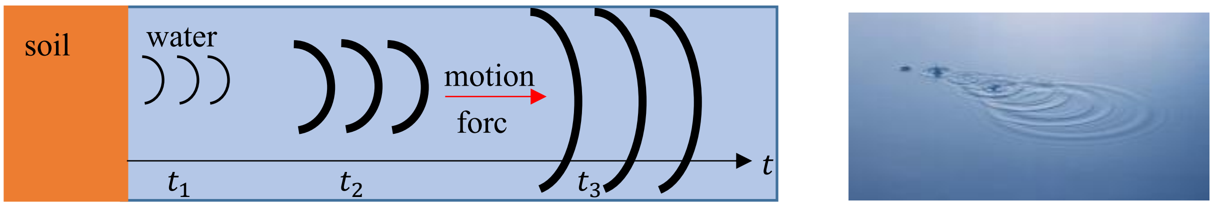


Figure 13- Intuitive representation of pond waves

This test demonstrates that the outer field has a low probability of achieving a full curl.

$$\vec{B}_{out}(\vec{r},t) = B_0 exp\, i\left(\omega t + \left(k_y y + k_z z\right)\right) = B_0 exp\, i\left(\omega t + (k_x x + k_z z)\right) = B_0 exp\, i\left(\omega t + \left(k_x x + k_y y\right)\right)$$

To achieve destructive interference points, a field can optionally be obtained from the three fields mentioned above. At the moment of disconnection between the external and internal fields, the value of $k_x x$ should be zero.

$$B = B_0\left(\cos\left(k_y y + k_z z\right) + i\sin\left(k_y y + k_z z\right)\right) \Longrightarrow$$

$$\begin{cases} \sin(k_x x) < 1 \sim \lim\limits_{x\to A} \sin(k_x x) = 0 \Rightarrow k_x x = \dfrac{\pi}{2}, \dfrac{3\pi}{2}, \dfrac{5\pi}{2}, \dots = \dfrac{(2n-1)\pi}{2} = \dfrac{2\pi}{\lambda} x \Rightarrow x = \dfrac{(2n-1)}{4}\lambda \\ \cos(k_x x) < 1 \sim \lim\limits_{x\to A} \cos(k_x x) = 0 \Rightarrow k_x x = 0, \pi, 2\pi, \dots = n\pi = \dfrac{2\pi}{\lambda} x \Rightarrow x = \dfrac{n}{2}\lambda \end{cases} \quad n \in \mathbb{N}$$

The smaller and larger signs are given for this reason, because $D < \frac{\lambda}{4}$. If $D \geq \frac{\lambda}{4}$, then the magnetic dipole is moving in outer space. (Figure 12-a)

Both the electric field and rock and water container tests are of the **divergence** vector field type. That is, there is no change in the electric field.

$$\vec{E}_{out}(\vec{r},t) = \vec{E}_{int}(\vec{r},t) = \frac{E_0}{|\vec{r}|} exp\, i(\omega t \pm kr)$$

According to the quantum analysis presented in Figure 4, it is anticipated that due to the presence of an electron, the productions are quantized (pulses). Therefore, a flow of fields from the sphere to the surroundings is not expected, and this relationship is described by ($E = nh\nu \quad , \quad n = 0,1,2,3, \dots$)

3.4.3- Electromagnetism difference caused by electron movement in figures 1 and 6

In general, a conductor possesses a sea of free electrons for conduction. In Figure 1, three electrons are evaluated from the sea of electrons, while the rest are disregarded. In Figure 6, only one electron is considered. Figure 1-f is discussed. Figure 4 is utilized to analyze electron behavior. The electromagnetic field is a vector field.

Figure 1-f: According to quantum mechanical measurements, at time t, three electrons are assumed to be in close proximity. During this time, these three electrons generate fields. These fields interact with each other according to the principle of superposition, resulting in a net field. Consequently, based on experimental results, the net field is an encompassing field.

In Figure 6: Quantum mechanical measurements indicate that at a given instant t, an electron is situated at a specific point on the surface of a sphere, thereby generating an electric field. By the principle of superposition, and in the absence of other interacting fields, the total field is equivalent to that produced by a single electron. Consequently, phenomena such as the photoelectric effect (energy quantization), Compton scattering (collision), wave amplitude, interaction laws, energy conservation, and the unique nature of a single electron suggest a probability that this field propagates through space as a wave, intrinsically associated with a photon.

The behavior of the particle in the electron and photon diffraction experiment involving two slits is chosen for analysis in the context of quantum states. According to the Stern-Gerlach experiment, the spin of a free (conduction) electron entering from a specific point can be determined as either high spin ↑ or low spin ↓. Similarly, the single unpaired electron within the valence band of each atom forming the sphere can also possess either a high or low spin. To facilitate a clearer understanding of this problem, several assumptions are deemed constant:

1. The free electron consistently exhibits a high fixed spin, $e \uparrow$.
2. The single electron in the valence band of each atom can have either a high spin, $E \uparrow$, or a low spin, $E \downarrow$.
3. The spherical surface is considered to be exceptionally small, comprising approximately 10 atoms.

Drawing an analogy from the Compton scattering experiment and the game of billiards: just as a striking ball in billiards causes other balls to scatter across the table, potentially leading to some falling into pockets. A free electron enters from the entry point and collides with $E_1 \downarrow$, then $E_5 \downarrow$, then $E_1 \downarrow$, then $E_3 \uparrow$, then $E_5 \downarrow$, and finally $E_8 \uparrow$, reaching the exit point $E_8 \uparrow$ (Zeus E is the atomic number). All these collisions are random. One electron came and one electron left. On the one hand, since the surface is closed (sphere geometry), the electrons revolve around the sphere during collisions (from one side of the sphere they go to the other side). In δ collisions, perhaps two photons are emitted. In every collision, there is an attractive and repulsive electrical force.

In accordance with the law of conservation of energy, the mechanical energy of the system $(E = K + U)$ is constituted by the kinetic energy of the five particles (e, E_1, E_3, E_5, E_8), the photon energy, and the energy associated with repulsion and attraction.

Experiment 3: To enhance the comprehension of these collision phenomena, a simplified experiment has been designed, utilizing the following equipment: power wire, battery, and a filament lamp.

An electrical circuit is made with these devices that turns on the battery of the lamp. The cross-sectional area of the wire is A (Figure 1-a) and the cross-sectional area of the filament of the lamp is A'. The power wire is made of a conductor with very low electrical resistance and the lamp wire is made of a conductor with very high electrical resistance. The electric charge moves on the surface of the conductor. Surface A is much larger than A'. At surface A', most of the electron energy is converted into photons.

Electrical conductivity: In a conductor, there is no gap between the conduction band and the valence band, but there is a gap in a non-conductor.

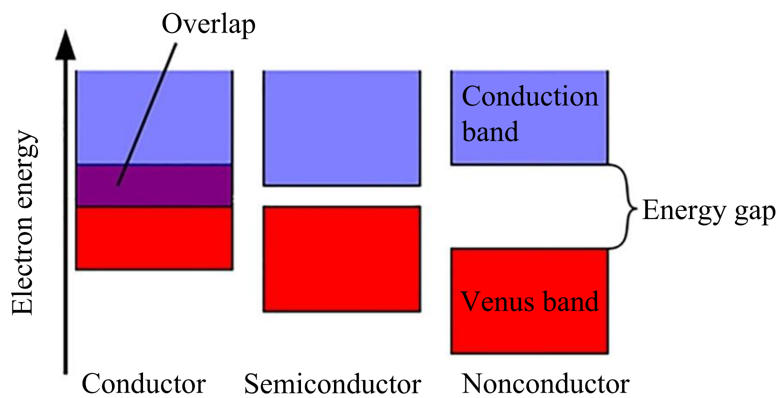


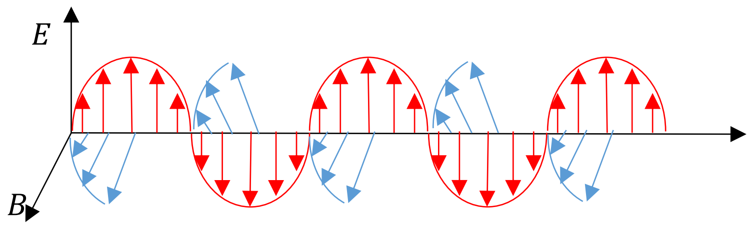
Figure 14 – Electrical conductivity in a material

According to the principles depicted in Figure 14:

1- If the sphere is composed of a non-conductor, the electron e must transfer all of **all** its energy to electron E_1 to facilitate E_1's movement. This behavior is analogous to that observed in an incandescent lamp. Consequently, the resulting wave production is substantially greater than the corresponding field production.
2- If the sphere is composed of a conductor, the electron e needs to transfer only a **small portion** of its energy to electron E_1 for E_1 to move. This scenario is comparable to current flow in an electric wire. Although there is a possibility of generating a field, its production percentage is very low due to the geometric structure, radius, and amplitude involved.

Ultimately, for the purpose of generating a monopole in medium 2, it is more advantageous for the sphere to be fabricated from a non-conducting material.

Based on the three experiments conducted and the analysis presented in Figure 6, the electromagnetic field diagram is plotted in three dimensions, as shown in Figure 15 (readers are encouraged to visualize this). The electric field is represented in 3D space, while the magnetic field is represented in 2D space.



$$\vec{B}:\begin{cases}(xy)\\(xz)\\(yz)\end{cases}\rightarrow \mathbb{R}^2 \qquad \text{Blue field } B$$

$$\vec{E}:(xyz)\rightarrow \mathbb{R}^3 \qquad \text{Red field } E$$

Figure 15- Diagram of the electromagnetic field by location in 3D

3.5- Relativistic perspective

A photon propagates through a vacuum at the speed of light, c. For an electron within the sphere to exhibit movement, it must possess sufficient energy to reach the edge of the potential well. However, the electron does not possess the necessary relativistic energy for relativistic motion on the sphere's surface. From a classical mechanics perspective, particle movement within matter is characterized by a refractive index $n = \frac{c}{v}$

4- Test sample

To facilitate understanding of the principles illustrated in Figure 6-d, a single-walled carbon nanotube, which possesses the thickness of a single atom, serves as an appropriate real-world example. This structure is composed of fullerene fibers (an allotropy of carbon) and exhibits spherical, oval, and cylindrical geometries (Wikipedia).

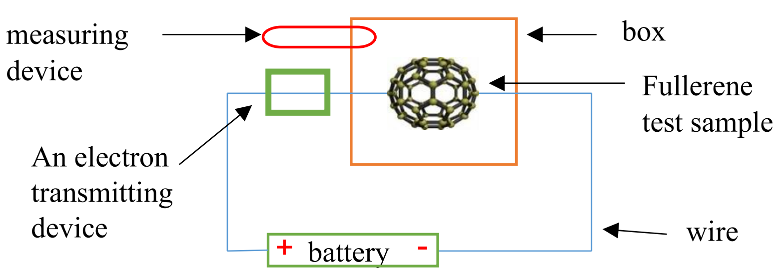


Figure 16- Intuitive representation of the actual test

To elucidate the functionality depicted in Figure 16, Figure 17 presents a designed pattern that closely resembles the test sample.

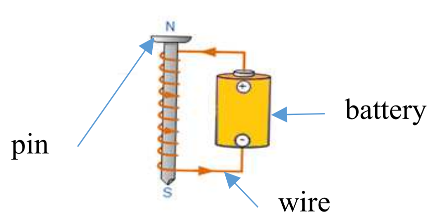


Figure 17- Magnetic field produced by coil and core

5- Application of particle in fundamental particle physics

A sealed box (isolated enclosed space) contains electrons or other particles. The walls of this box are designed to **prevent the entry** of external particles and energy. Within this confined system, the interaction between the electromagnetic field of the electrons and the magnetic wave, in the absence of rotation, is investigated. Observations and measurements obtained from this setup provide insights into the behavior of the electron within a non-rotating wave field, contributing to a more comprehensive understanding of fundamental particles.

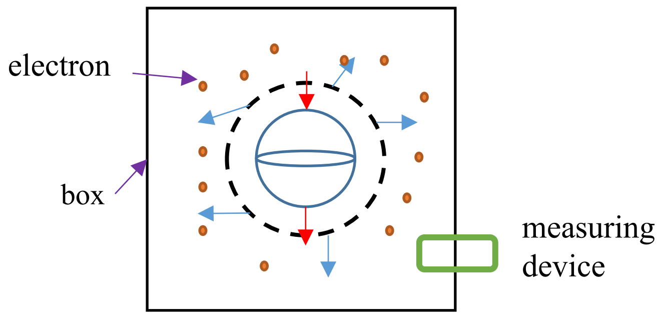


Figure 18- The interaction of the electromagnetic field of the electron with the magnetic wave without rotation

6- The following experiment is the author's imagination.

In Figure 6-d, environments 2 and 3 exhibit scattered and weak waves, making their detection challenging. To address this difficulty, an alternative experiment, depicted in Figure 19, has been conceived. This experiment proposes the generation of waves that are sufficiently dense and strong to be detectable using simple technology.

The sphere is made of 2 parts. One part is made of conductive material from $0 \leq \hat{\varphi} \leq \frac{\pi}{6}$ and the other part is made of non-conductive material from $\frac{\pi}{6} \leq \hat{\varphi} \leq 2\pi$.

Electrons are permitted to pass exclusively through the conductive segment. A constant average electric field E_{avg} , is applied to the sphere to achieve the highest current density J_{max} thereby facilitating electron movement into a flight mode. Consistent with the energy band theory of atomic lattices, conductors possess no energy gap between their valence and conduction bands. Furthermore, electron movement in conductive solids accommodates a range of energies, characterized by continuous scrolling.

The non-conducting component of the sphere is designed to absorb all incident waves and convert them into phonons. A rod connects the non-conducting part to a container of liquid (water), serving as a medium for phonon transfer. The vibration of the liquid, induced by the phonons, effectively neutralizes the phonon energy of the sphere.

The waves generated by the conductor are identical within medium 1, due to the presence and rotational flow of flying electrons. In environment 2, conversely, the waves exhibit minimal rotation, propagating in a co-directional manner with high energy concentrated at the spatial boundaries.

To prevent anomalies in environment 2, the non-conductive portion of the system must be dimensionally larger than the conductive part. This design ensures the complete absorption of all waves within the sphere, thereby preventing their escape and maintaining the desired conditions in environment 2.

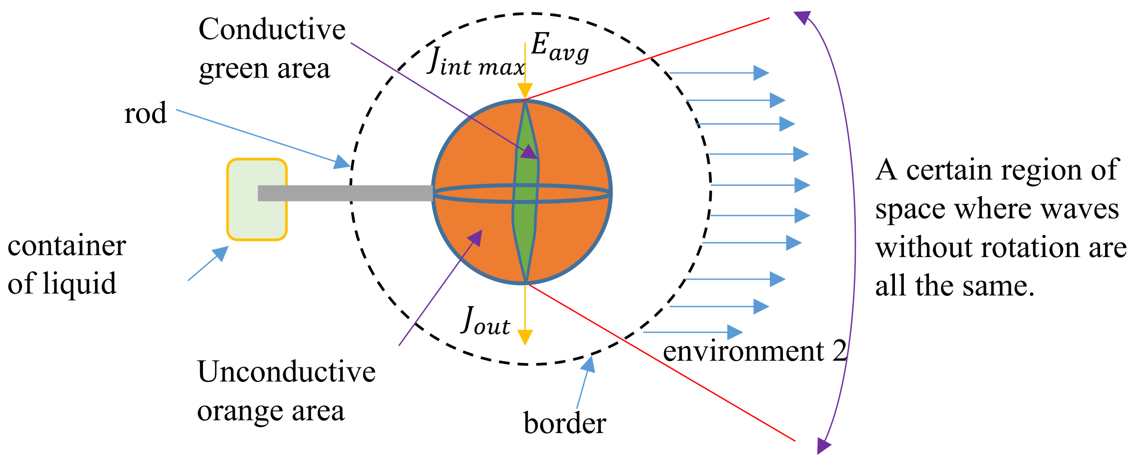


Figure 19- Design of an ideal sphere, to generate homogeneous magnetic waves without rotation

7- Computer simulation method

The use of COMSOL Multiphysics software is recommended for simulating the proposed design to construct Figure 21.

Initially, a Cartesian coordinate system is established. Subsequently, a square cube with side length $l = 16\ nm$ is drawn, with its center aligned with the origin of the coordinate system. The cube is defined as a wall surrounding the device, designed to create an isolated closed space.

A sphere, with a thickness of one atom and composed of carbon (or other materials such as iron, gold, aluminum, copper), is positioned with a radius of $r = 1\ nm$ and its center coincident with the coordinate system's origin.

Sphere is selected from conductive materials. In a conductor, the capacitance and conduction bands coincide. As a result, the electron that wants to move in the conduction band must be separated from the effective force of the nucleus. That is, the electron is in the potential energy $V = E_{n,l}$.On the other hand, the sphere is made with these atoms, all of which have this potential value. As a result, the atoms have created an equipotential surface. An electron that wants to go from the entry point to the exit point must consume energy in this way, the value of which is $E_e = E_{n,l} + E'$. The value of E' consists of 2 parts.

1- Energy to move on the surface of the sphere E_k

2- Resistance energy E_ρ. $(E' = E_k + E_\rho)$ Resistance energy is the energy that prevents the movement of the electron and this energy shows itself as radiation.

A wire is connected from the exit point of the sphere to the outside cube, which is then connected to an electrical consumer. The internal effects of the wire within the cube should be eliminated.

An electron gun is positioned outside the cube. A hole is created in the surface of the cube to ensure that the gun, the hole, and the entry point are all aligned, enabling the electron gun to precisely shoot an electron.

In quantum mechanics, an electron (or any particle) is described by a wave function. Thus, an electromagnetic wave with amplitude A and frequency ν propagates towards the sphere's entry point.

$$\begin{cases} A > D = 2r = 2 \times 1 = 2\,nm \\ A \to \dfrac{\lambda}{4} = 2.2 \Longrightarrow \lambda = 4 \times 2.2 = 8.8\,nm \end{cases} \qquad E_{n,l} = -hcR_\infty \frac{z_{eff}^2}{n^2} \qquad E = h\nu \Longrightarrow \nu = \frac{E_e}{h}$$

After impacting the sphere, the electron emits the electromagnetic wave that is the subject of our measurement.

Consistent with the definition of a sphere's radius and as illustrated in Figure 20, ultraviolet radiation possesses wavelengths ranging from 1 to 100 nanometers. Within this spectral range, sufficient energy is available to ionize or displace electrons within a given material.

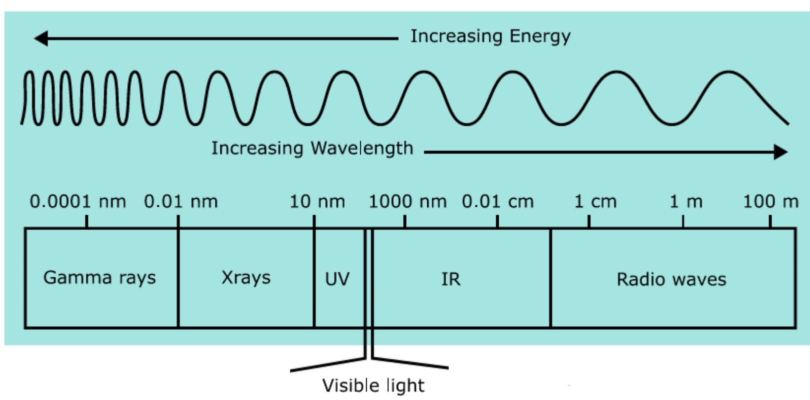


Figure 20- Electromagnetic spectrum

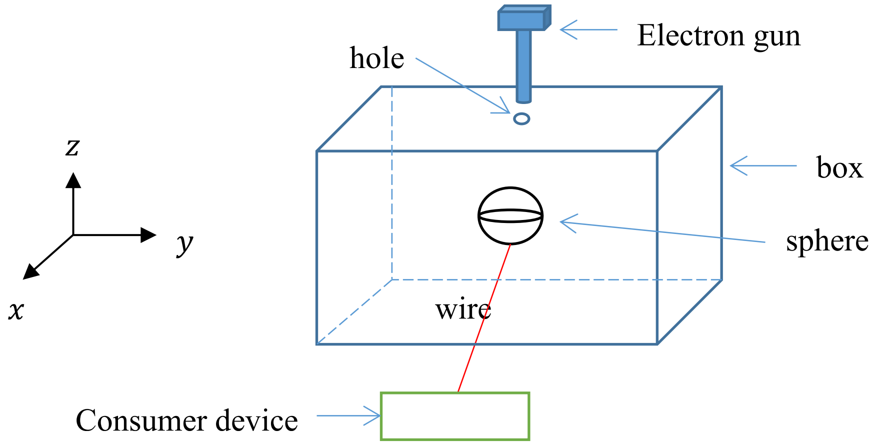


Figure 21- An intuitive view of the simulation device

Conclusion

The goal of the theory is to create a magnetic monopole wave with the help of electron motion and a magnetic dipole field.

In the text, three experiments are given to explain the theory, which have the following meanings. Experiment 1 demonstrates the division of the field, while Experiment 2 illustrates the field's separation from the object's surface. Experiment 3 provides evidence that the field can exhibit photon-like movement.

Five conclusions are drawn from this theory:

1- Upon the disappearance of the internal space within the object, only the external magnetic field persists.

2- For the scenario depicted in Figure 3, the magnetic field is rotational, exhibiting a collective behavior with the field aligned in the same direction as the angle $\hat{\varphi}$.

3- In contrast, Figure 6-d illustrates environment 3 as containing magnetic waves without rotation, which propagate along the radius $\hat{r}$, indicative of individual wave behavior.

4- This object functions as a source, emitting an electromagnetic wave.

5- In Figure 1, the nature of magnetism is a field (a vector field that rotates around an object), but according to the description of Figure 4, magnetism in Figure 6 is a wave (a vector field that is moving in space and time).

The importance of these results is that Gauss's law in electromagnetism is almost incompatible with this model and may lose its validity by testing the relationship $\vec{\nabla}.\vec{B} = 0$ from the state of the law.

Two scientists named Andre Geim and Konstantin Novoselov, who won the Nobel Prize, created the structure of graphene. The magnetic monopole piece has a graphene structure. But graphene has laboratory limitations until it is commercialized. If this piece becomes commercial, it will revolutionize the manufacture of electrical and electronic components.

Overall, this theory is somewhat similar to Dirac's monopole theory. On the other hand, the experiments in Figure 18 indicate that there is a possibility of changes in the table of the Standard Model of fundamental particles. The result is that textbooks are changing.

Note

Following the initial conceptualization of this article, I commenced developing ideas and conducting mental experiments in a scientific research format in mid-2012. These investigations concluded by the end of 2018. During this period, I diligently sought a robust and scientifically sound idea, which eventually materialized as depicted in Figure 1. The formal articulation of these ideas into an article, complete with calculations and analyses, began in early 2019 and continued until the autumn of 2025.

Education: Bachelor of Physics, Birjand University, Birjand, Iran, 2012-2016.

Funding statement: This article did not receive any external funding from any organization; all associated expenses were personally covered.

Scientific statement: This entire body of work is the result of individual effort, and researchers are granted free use of this source.

Data Availability Statement: No external data is associated with this manuscript. The information presented herein is derived solely from personal initiative and an analysis of natural behavior. This information is not duplicated in existing online resources, physical textbooks, or other non-textbook materials. For further details, please contact alihadadpour71@gmail.com.

Unfortunately, in my country, Iran, wherever I went (universities, research centers, the army, etc.), they did not value my theory. To do simulation work and manufacture the part, you need a budget and a laboratory, which I do not have. I request the journal to introduce the article to research centers or universities if it is accepted so that I can receive a scholarship for the article and continue my studies. I am grateful to the journal for its cooperation.

Reference

1) David Halliday, Robert Resnick, Jearl Walker. 11th. ed, 2019, *Fundamentals of Physics*, all pages.
2) Reitz, John R. 4rd ed. *Foundation of Electromagnetic Theor*, all pages.
3) Griffits, David J. *Introduction to electrodynamics*. Fourth edition, 2013, all pages.
4) Stephan Gasiorowicz, John Wily. *Quantum Physics (Third Edition)*, 2003, all pages.
5) Stone moving on water - https://www.aparat.com/v/e35ev16