World Scientific Research Journal Volume 10 Issue 2, 2024
ISSN: 2472-3703 DOI: 10.6911/WSRJ.202402_10(2).0010

The Perfect Representation of the Quantum World through Quantization of Matter, Time, and Space

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Abstract

This paper investigates the laws governing matter, time, and space. The existence of non-locality and lack of reality, genuine randomness, and superposition states possessing objective physical reality are debated. The essence of the world is quantum, and the macroscopic is a statistical representation of the microcosm. Objective reality at the microscopic level is far from logical, and genuine randomness implies the absence of objective reality. The continuous appearance of matter at the macroscopic level is due to the interaction of microcosms.

Keywords

Quantum mechanics; Superposition; Objective reality.

1. PREFACE

Further research into the fundamental principles governing the three elements of material, time, and space can help us unravel some of the fundamental questions about the nature of the world. Do non-locality and absence of reality exist? Is there true randomness? A clearer understanding of the underlying principles of the world can provide a better foundation for understanding the subsequent rules built upon them. The nature of the world is quantum in essence. Apart from energy, time, and space are also quantum. In the microcosmic realm, energy was quantized previously, but time and space were not. This led to the sense of strangeness. In a microcosmic context, the objective reality exists discontinuously in both time and space. When understanding the behavior of particles in this context, it aligns with logic: Before being observed (Observation is just one form of influence, for the sake of simpler understanding, we will use "observation" to describe it in the future), particles virtually (no reality) traverse all possible paths. This is the true probability (having true probability negates complete determinism). True probability signifies the absence of objective reality (It doesn't imply complete absence, but external changes can influence true probabilities), and true probability differs from changes in judgment probabilities caused by the lack of information parameters. It's only after observation that a sudden emergence of reality occurs.

Quantization of Energy: The size of matter isn't infinitely divisible; it's composed of fundamental particles, including their energy radiations and energy exchanges.

Quantization of Time: In the microcosm, the objective reality exhibits discontinuity in time, being virtual and non-existent over certain time intervals until it suddenly emerges at a specific moment, impacting the external world.

Quantization of Space: In the microcosm, the objective reality displays discontinuity in space. Spatial trajectories are characterized by true probabilistic discontinuities, being virtual and non-existent until they suddenly emerge at a specific location point.

In summary, matter is not infinitely divisible but is composed of fundamental units. It exhibits discontinuities in time and space, only emerging at certain points in time and space through a

ISSN: 2472-3703 DOI: 10.6911/WSRJ.202402_10(2).0010

sudden transition from non-existence to existence. This is manifested, for instance, through the uncertainty principle, where properties such as volume, position, momentum, time, and energy cannot be simultaneously determined with absolute certainty.

Microscopic trajectories, motion, and changes exhibit discontinuities, uncertainties, non-existence, true disappearance, intermittent appearances, true randomness, true probabilities, and can spontaneously transition from non-existence to existence in response to external influences. The quantization of space and time means that the existence of matter (Objective reality) in space (Trajectories are discontinuous) and time (intermittent) is not continuous.

The three fundamental elements of the physical world are matter, time, and space. While energy is quantized, what about time and space? Is the essence of the world quantized? Quantum states exist in the micro world and exhibit discontinuities, but when we transition to macroscopic statistics, it appears as a continuous state. This is why humans have been puzzled by quantum mechanics. It's similar to the counterintuitive nature of concepts like the constancy of the speed of light and the quantization of energy. These ideas are in line with experimental evidence, giving rise to both relativity and quantum mechanics. However, quantum mechanics still presents many phenomena that defy common sense, even leaving Einstein puzzled. Ultimately, it all comes down to a matter of perception, much like how we couldn't initially grasp that energy is quantized and that there's a limit to speed, among other things.

The changes in the motion of matter involve properties related to space and how they evolve with time, which includes motion trajectories and more. When discussing a critical point, the question arises: is this quantized or continuous? It's proposed that these properties are quantized, indicating discontinuities. New experiments will be used to provide more direct evidence for the discontinuity of motion trajectories.

2. PRELIMINARY RESEARCH

Revolutionary discovery: Matter, time, and space are all quantized, meaning they can be discontinuous. The existence of matter intermittently, (in the micro scale, exhibits probabilistic behavior and, through random processes, can give rise to macroscopic precision, determinism and continuity) meaning that for extended periods, there may be no presence of the matter in any space, and it remains purely virtual with a certain probability of being in certain spaces. It is only when certain conditions affect the matter that it abruptly exists. Does a matter exist? This depends on whether it can be perceived. True randomness and genuine probability can be equated with true virtual invisibility, implying non-real existence. True comprehension of the discontinuity in motion and change is essential to understand quantum mechanics.

Whether referring to particles, it needs to be explained at the quantum level. A particle's probability of appearing in certain spaces during a specific time interval exists. Under certain conditions, particles can appear at a specific spatial point seemingly out of nowhere at a certain moment in time (time point). The reason for using 'time interval' earlier and 'time point' later is that it will be explained in detail in the subsequent sections of the paper. This is due to the uncertainty principle, making 'time point' less appropriate in the context of genuine probability. When particles decay, space can remain relatively unchanged, with the primary focus on the moment of abrupt mutation. Entanglement refers to more than one seemingly spontaneous point of origin; in one instance, something emerges seemingly out of nowhere, while in the other, related probability parameters become deterministic. When three or more are involved, the probability parameters of the others may also change. Abrupt mutations, appearing seemingly out of nowhere, can occur spontaneously or be influenced by external factors.

Is Schrödinger's cat alive or dead? Which slit does the double-slit interference really go through? How to provide a correct and perfect explanation for the causal reversal issue in quantum erasure and delayed-choice experiments? Why is the superposition state considered

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incorrect? The Copenhagen interpretation, and more, will all be reinterpreted in the following sections.

Humanity has progressively overturned past conceptions, such as the understanding that the universe is not centered around the Earth, that the Earth is round, not stationary but in motion and rotation, that matter is not infinitely divisible, that light is quantized, and that the speed limit is the speed of light. It involves quantizing time and space, true virtuality, true invisibility, true randomness, true probability, and the abrupt emergence of existence from non-existence. Trajectories, motion, change, influence, existence, objective reality, and more can all be discontinuous.

3. ANALYSIS AND EXAMINATION

The motion law of quantum particles, in simple terms, means that the trajectory of their movement is a range, a probability, a true probability, and it is discontinuous. It’s the sudden emergence out of nothingness, which means there can be no process in between point A to point B, and no objective reality until a sudden appearance at point B. Between point A and point B, there are many possible paths where the appearance can occur. If there is no detection along these possible paths, it won't appear, implying the absence of objective reality. However, if detected, there's a probability of its appearance. Its appearance on a particular path doesn't necessarily mean it took that path before. This is the reason for the quantization of time and space, where there can be true probability of non-objective reality before the appearance. 100% certainty is just a special case. This viewpoint is supported by the following experiments and reasons.

3.1. Which slit do particles pass through in double-slit interference

Double-slit interference, which slit does the particle pass through? It doesn't pass through either slit, let alone simultaneously through both.

Double-slit interference: it is incorrect to say that double-slit interference passes through both slits simultaneously, quite the opposite, if no observation is made at the double slits, it should not have passed through either slit, it appears out of nowhere on the screen, with no intermediate process or trajectory; in other words, there’s no existence of the particle in between; its merely a virtual probability of potential appearance. The three fundamental elements of matter, time, and space are quantized at the microscopic level. Particle motion and change are quantized, and trajectories are discontinuous. Their real trajectories are point-like and quantized. If one detects a particle at any one of the slits, it actually influences the particle, here, an abrupt emergence from nothingness occurs, transforming true probability into objective existence, turning the virtual into the real. For instance, the light beam we see in our daily lives is also a part of it that has been influenced and transformed into real photons, which reach our eyes and persist, creating the perception of a light beam. When particles influence other matter, its their abrupt emergence from nothingness, becoming objective reality.

Double-slit interference: It didn't pass through either slit, didn't simultaneously pass through both slits, and there's no superposition state. Photons appear out of nowhere on the screen. The interference pattern is determined by the true probability distribution of abrupt emergence on the screen. This is fundamentally different from macroscopic wave interference, which is not determined by true probability, is predictable, and is only used as an analogy in some aspects.

3.2. The correct interpretation of Schrödinger's cat

The Schrödinger's cat hypothetical experiment itself is quite understandable, but the fictional concept of superposition has overly complicated it by characterizing it as simultaneously alive and dead. The explanation involving superposition is erroneous. It is not a superposition state

ISSN: 2472-3703 DOI: 10.6911/WSRJ.202402_10(2).0010

but rather a sudden emergence from nothing. At a specific point in time, whether the particle decays and the cat's life or death are both objectively real.

In the first scenario, if the particle decays, both the decay and the time, as well as the cat's life or death, are objective realities. In the second scenario, if the particle does not decay, the cat is alive, and the decay time follows a probability distribution. (After observation, if there is no decay, the change occurs in the decay time probability distribution, and the system resets and starts anew)

At a certain point in time, whether a particle will decay and the cat's state of life or death are both objective realities. The decay time of the particle follows a probability function with respect to time, so not knowing when the particle will decay means we also don't know when the cat will die. Therefore, we cannot claim that the cat is in a superposition of life and death. If the particle has already decayed, then the cat is already dead, and the times of decay and death are objective realities, irrespective of whether observation has occurred. Spontaneous emergence from nothing can occur spontaneously or be influenced by external factors, although the spontaneous decay of particles is generally independent of observation.

The explanation of superposition is entirely incorrect. Decay and the cat's death both have specific points in time as objective realities. They are 100% probability abrupt emergence points, and it is impossible to precisely predict when decay will occur. It does not imply both change and constancy, nor does it suggest both life and death. It is not a superposition of life and death but rather a sudden emergence from nothing. Even if the cat is not observed at a certain time, its state of life or death and the time of death are already determined. If you open the box and observe, you will find the cat has already died, and the exact time of its death is also determined. The point of death is just the moment when the probability of particle decay abruptly transitions from a true probability to a 100% objective reality. It's essential to distinguish between the macroscopic and microscopic worlds, even though the macroscopic is a statistical representation of the microscopic. Just as in the macroscopic world, flipping a coin to determine heads or tails is not true probability; it's simply a reduction in available information, and the outcome is already determined from the moment the coin is tossed.

The earlier mention of decay as a sudden emergence from nothing will be explained in more detail later. The use of the term "superposition" is inappropriate, and the concept of parallel universes is challenging to grasp. Human understanding often resorts to concepts like God and divinity to explain such phenomena. When parallel universes are brought up, questions arise about whether these universes follow the same laws, how many orders of magnitude of universes there might be, whether matter can be created out of nothing, whether energy conservation holds, whether there is entanglement between parallel universes, what the relative velocities between parallel universes are, and whether information can be transmitted faster than the speed of light. Therefore, using these concepts for explanation in this context seems absurd.

The cat can be considered as an observer, and its life or death is related to the decay of the particle. Of course, stronger relationships can be established as well, such as with the Earth. The cat's life or death is definite, and our lack of knowledge does not imply uncertainty. This is an objective reality, a probability abrupt emergence point. The inability to precisely predict the moment of decay doesn't mean a simultaneous change and constancy, nor does it imply a superposition of life and death. Instead, it represents a sudden emergence from nothing. Even if the cat is unobservable at a certain time, its state of life or death and the time of death are already determined. Please remember the key point: the result we aim to predict is a probability, but decay and death are abrupt emergence points with a 100% objective reality.

Particle decay is governed by a probability function over time. If you observe a particle at a certain time and it doesn't decay, it will alter the relationship with its decay probability function.

ISSN: 2472-3703 DOI: 10.6911/WSRJ.202402_10(2).0010

This is the impact of observation. However, for a group of particles that are expected to decay, the mathematical statistics are consistent. The only difference is that the particles that have decayed are not included in the statistics. When observing a group of particles, close to one half-life, the remaining particles don't suddenly change their half-life to one hour, right? If there's no decay, the time function starts over. If there has already been a decay, the probability is 100%. The binding relationship between the cat and the particle, as understood previously, was incorrect. It is not in a superposition of life and death. The correct understanding is as follows: Before decay, particle decay is a true probability event, and it is impossible to precisely know when it will occur. The time of decay follows a probability function, and the exact time of decay cannot be calculated.

Summary of Schrödinger's Cat Thought Experiment: There is no superposition, so there is no cat that is both alive and dead. Particle decay is a true probability event, and we can only determine the probability of it occurring at a certain time. Therefore, the cat is bound to the particle's decay. When the cat is alive, determining the time of death becomes a true probability. However, the state of life or death at a specific moment is an objective reality. If we shield the observation chamber and have one person observing from the inside and another from the outside, any differences in their observations are due to information gaps. The observations from the inside align with the objective reality.

3.3. The correct interpretation of Schrödinger's cat

Due to the quantization of time and space, the discontinuity of space, and the absence of real trajectories, there is no notion of traveling along two paths. Instead, particles abruptly appear at their endpoints. Therefore, the influence of environmental changes before a particle appears at its endpoint is not surprising according to this theory. Delayed-choice experiments become more understandable and explainable within this framework.

3.4. The correct interpretation of delayed-choice quantum eraser experiments

Among entangled particles, the one that is influenced first will undergo an abrupt emergence from non-existence (The particle that arrives at the screen first when observed). This is the cause, affecting the other entangled particle in the process.

The current explanations regarding the delayed-choice quantum eraser experiment are all based on a misunderstanding of the true essence of quantum mechanics. They employ incorrect principles and reverse the causal relationship. In reality, the entangled particle that is first influenced undergoes a sudden emergence from non-existence. This particle is the cause, which then affects the other entangled particle's state. In a pair of entangled photons, when one photon arrives at the screen first, the position of this photon on the screen, if it falls on the peak of D01, determines where the entangled photon will land on detector D1. Similarly, if it is at the trough of D01, it determines the entangled photon's location on D02. Most other cases are not extreme but represent a situation of complementary probabilities. In fact, the experiment's title is also incorrect; there is no quantum erasure.

3.5. Quantum entanglement

Quantum entanglement is a specific manifestation of abrupt emergence from non-existence. Entanglement involves not just one, but multiple spatial emergence points. When several particles are entangled, if one of the particles experiences an abrupt emergence from non-existence, transitioning from virtual to real, the others may still remain in an entangled state, but their probabilities may change. It is true randomness and true probability. This can be tested in future experiments.

As for why these points don't all transition from virtual to real simultaneously, there is a principle behind this. To transition from probability to reality, there are times when the

ISSN: 2472-3703 DOI: 10.6911/WSRJ.202402_10(2).0010

presence of an influencing objective reality is required. The other spatial emergence points may not have undergone their transitions yet; they remain in a state of true probability. In the case of two entangled particles, when one of them has already undergone the abrupt emergence from non-existence, the other, even without an influence, manifests its existence, and its parameters become certain.

Quantum entanglement is a state of true randomness and true probability with parameter correlations between states. In another perspective, it differs from information transfer; it is simply an abrupt emergence of existence across more than one spatial point. For example, it includes the sum of all probability spaces equal to one at a given time. Here, we are discussing entanglement in terms of certain parameters of particles that have specific relationships. For example, if you have three particles with a total angular momentum of zero, and you determine the angular momentum of one particle, you also determine the sum of the angular momenta of the other two particles. Similarly, the remaining two particles' angular momenta continue to be entangled, and the total angular momentum relationship between them is also determinable. However, each particle individually remains in a true probabilistic state. They exhibit non-local correlations in terms of true probabilistic parameters, and this doesn't violate the speed of light.

The change in the properties of material space due to motion, including trajectories, etc., comes to a crucial point: is it quantized or continuous? The existence of properties (Motion, trajectory, change) is discontinuous.

Disrupting Everyday Macroscopic Life: Quantum Nature of Material Time and Space, existence can be discontinuous. The existence of matter can manifest intermittently, meaning that for much of the time and in all spaces, the matter is not present. This matter exists virtually with a certain probability of appearing in certain spaces until certain conditions influence it, causing it to suddenly emerge into existence. Whether something exists is determined by whether it can be perceived. True randomness and true probability represent true virtual invisibility, implying that they are not genuinely real. Understanding the discontinuity of motion and change is crucial for a genuine comprehension of quantum mechanics.

Starting from the quantum level, particles exist as a probability of being in various spaces during specific time intervals. Under certain conditions, they may appear suddenly at a specific point in space. The usage of "time interval" earlier and "point in time" later is due to the uncertainty principle, which makes the use of "point in time" inappropriate under true probability conditions. For instance, particle decay involves space that can remain relatively unchanged, focusing solely on the time of the abrupt change, while entanglement entails more than one sudden change in space.

3.6. Wave function

The wave function is a mathematical tool used to describe the probability distribution of finding a particle in various states in the quantum realm. It is not a physical reality in itself but a mathematical representation of the probabilities associated with the particle's properties. Microscopic particles in the quantum world do not behave as macroscopic waves. While there are some similarities in certain aspects, true probability in quantum mechanics does not represent objective existence. If it were to represent objective existence, it would be a form of false or pseudo-probability.

3.7. Bell’s inequality

If Bell's inequality holds, then local realism is established. The violation of Bell's inequality only indicates non-locality. If something is not truly random from the beginning, detecting one particle's state can't prove true randomness, as even in the case of true randomness, superluminal entanglement is required. Whether a system exists in a fixed or random state

ISSN: 2472-3703 DOI: 10.6911/WSRJ.202402_10(2).0010

before detection, with no influence on the outside, is meaningless, or in other words, it doesn't exist.

Furthermore, there is no need for additional experiments as there are already experiments that demonstrate the violation of Bell's inequality. In entangled states A and B, if you measure A, and B is measured in a direction aligned with A, the probabilities are linear. However, if the direction of measurement for B has an angle with respect to A, the probabilities become non-linear, which leads to a violation of Bell's inequality. It's important to analyze various scenarios where influences can be regular or irregular. These influences can be discontinuous. The violation of Bell's inequality alone cannot distinguish between these scenarios.

3.8. Heisenberg Uncertainty Principle

The uncertainty principle can also effectively support the theory mentioned above. In terms of time and space, the material reality is discontinuous, with gaps and true probabilities emerging. In fact, at the moment of emergence, reality is manifested. It is precisely because there is no objective reality in true probabilities that it leads to the uncertainty of physical quantities. Some physical quantities need to meet certain requirements and, at the same time, share some quantum properties that align with true probabilities. When reality is manifested, attributes such as position and momentum become certain. Double-slit interference, delayed choice, uncertainty principle, matter waves (De Broglie waves refer to a relationship between matter, time, and space, where the influence exerted at one point in space may extend beyond that point), the generation of photons starts with the speed of light, without any acceleration process, which is a manifestation of the lack of objective reality.

3.9. What is wrong with the Copenhagen interpretation?

Does superposition have objective reality? If particles exist objectively, then when they collapse, the change in the particle's position would exceed the speed of light, while the existence of the quantum nature of space and time imposes a speed limit on the total change in position and time.

Why is the superposition state considered wrong? How to prove that particles pass through both slits in the double-slit interference experiment? In fact, quantum phenomena bear a resemblance to macroscopic interference effects, but they do not involve self-interference, so there's no need to invoke the concept of superposition. One thing that seems hard to explain is why quantum interference phenomena vanish upon measurement. This actually occurs because the act of measurement alters the conditions and affects the quantum behavior. Now, we can experimentally determine which slit the particle went through without affecting the interference pattern. Time and space are quantized, with the potential for sudden emergence from non-existence. This is in line with Occam's razor principle, and the examples provided earlier support this notion. What is the necessity of conceiving a non-existent superposition state when you cannot prove the objective reality at true probabilities? The essence of the quantum world is "quantumness."

In a quantum system, before measurement, the system may be in a latent state (It means non-existent, there is no superposition state, before the sudden appearance is a situation that could happen with a probability, but essentially nothing has happened, and it has had no impact on the external world. There is no objective reality; it's just a virtual assumption). The act of measurement causes a "mutation". The original quantum state probabilistically mutates into a quantum state allowed by the measurement. (There is no collapse of superposition states; instead, the probabilistic occurrence of something from nothing may occur under specific conditions, leading to a mutation into a particular state. Measurement is just a special case within the conditions where something from nothing can probabilistically happen.)

ISSN: 2472-3703 DOI: 10.6911/WSRJ.202402_10(2).0010

4. CONCLUSION

In summary, matter, time, and space are quantized in the quantum realm. Real existence exhibits discontinuities, true probabilities exist, non-locality is present, and quantum properties can be shared. The change in the position of matter is constrained by locality, and the transfer of matter cannot exceed the speed of light. However, massless shared properties, such as quantum entanglement, are exceptions to this, where matter and space exhibit locality but without influence. (It can also be said that the state of matter does not necessarily correspond to the spatial distribution of matter.) The most crucial point is that at the true probability state, objective reality is missing, and once it's proven to exist, it becomes non-true probability. There are no superposition states; particles undergo a sudden transition from non-existence to existence. Causality remains valid. (There is no effect preceding the cause, and there is no quantum erasure) If objective reality exists, then there is no true probability. The uncertainty principle also serves as a good proof of this. In the quantum world, the discontinuity of material existence in time and space leads to a lack of true probability. When it does appear, the manifestation of objective reality occurs. This is because the absence of objective, true probabilities results in physical quantities having uncertainty and needing to fulfill specific requirements. At the same time, sharing certain quantum properties also aligns with true probabilities. The moment when it manifests as reality, such as position and momentum becoming definite, is a result of this alignment with true probabilities. Double-slit interference, delayed choice experiments, the uncertainty principle, the instantaneous generation of photons at the speed of light, Schrödinger's cat, and more—all of these phenomena can be logically deduced to support the absence of superposition states and the idea that particles emerge through spontaneous creation rather than superposition, in accordance with Occam's razor principle. The Nature of the Cosmic World (The Fundamental Laws of the Universe): The three essential elements of the cosmic world, namely matter, time, and space, are all quantized. The Discrete Nature of the Universe: Discontinuity in Size, Trajectories, and Objective Reality. The Discrete Nature of the Universe: Discontinuity in Size, Trajectories, and Objective Reality. There is no quantum erasure, reality has discontinuity, and true probabilities exist. (With true probabilities, determinism is negated) True probabilities differ from changes in probability resulting from missing information parameters. There are no superposition states. Measurement is just one way to change the environment. Microscopic randomness leads to macroscopic precision, determinism, indistinguishability, or interchangeability.

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