On Unified Quantum Physics

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Introduction

There has long been a need to unify Quantum Mechanics and General Relativity. The attempts to unify them have failed or fallen short in many aspects. Here I will present multiple reasons to abandon the current interpretations of reality and present a new model. The goal of this paper is to present a universal theory of everything, representing all four fundamental forces and describe time.

This paper is a collection of multiple papers and and each section will have its own introductory and build off of other principles established in previous papers.

Warning

This paper will conflict with many modern interpretations of Quantum Physics and directly deify General Relativity. It also challenges the standard model and refutes String theory. It is recommended to read this with an open mind, and to wait until the end before critiquing the wording used. Many unusual terms will be used, and non-standard statements will be made. This paper is in a fairly unusual format as it is a collection of works.

Superposition Collapse Causality Paradox

Introduction

Here I will be showing the paradox of causality when a particles collapses from a superposition. This is a foundational point of my theories on quantum systems and particles structure along with quantum time.

The paradox

Let us imagine a universe in which there exists only two electrons, separated by one light-second. In this universe, these particles are moving at one half *c* toward each other. This universe may be thought of as a closed system.

Now we know that these particles exist in a superposition at the initial state of the system, due to the lack of any other external source of interaction. The wave functions of these particles should collapse within one second of the systems existence. Though by the distribution of their wave functions we also know that they may not necessarily collied, as they may diverge from their classical trajectory.

The paradox now arises that it is impossible for these particles to every collied, as they are both in a superposition in their initial state and in order for a collapse an measurement must take place. The only way for a measurement event to take place is for the particles to collide or interact in some way. Now we see the problem that these particles can not collied without a collapse of their wave function. Thus we are now caught in a catch-22. This paradox requires a collapse of wave function to cause a collision of miss, before the collision that cases the wave function to collapse can occur. Thus the entire universe exists in a superposition.

An objection may be given, that the particle’s wave function could collapse due to the interaction of fields. This though causes the problem that the fields are always present. Thus for this argument they must always exist in a state of collapse. Thus superposition becomes a meaningless term.

Now the reader may suggest that perhaps another particle will arise from vacuum fluctuations. This causes the exact same paradox, as if a particle comes into existence the particle exists in a superposition and can never collied! Even worse in order for this event to create a

particle there must be a collapse. The interaction of the particles and even their very existence can not come to being without a collapse of a wave function.

Now this may be extended with infinity many particles, but the problem still persists! If any particle interaction does occur, the result will immediately also be thrown into a superposition and the paradox arises again. From this I think it is logical to conclude that any universe will exist in a superposition in itself, having no possibility of internal events.

This either implies an external existence beyond the universe that causes the collapses, and/or it implies that there is a never ending cycle of spontaneous state transitions of particles that never exist in a superposition.

This same experiment can be done with the classical cat in a box analogy. Take two cats in two boxes and put them in a vacuum, then neither can can confirm the state of the other even as they approach as they can not open the box without collapsing their own wave function, which is the exact concept that leads to spontaneous transitions.

Time Dilation Through Quantum Transition (Quantum Time Dilation) and The Removal of Time From Space

Introduction

In the 1920s, Albert Einstein described gravity through a geometric distortion of a four dimensional fabric called space-time. This theory introduced paradoxes by mathematically allowing for matter and/or energy to travel into the past. There have been many proposed solutions to this, such as proposing that only non-information bearing energy may be transmitted. This still does not resolve the underlying issue.

Here I will be describing a framework of Quantum Time Dilation, through a framework of quantum events where waves “collapse” at set intervals. This does present challenges to the classical understanding of probability waves of a particle. First though I will explain my theory and then will touch on some of the implications.

1. Quantum velocity.

To begin with I will propose a system of describing velocity, in which velocity is an energetically induced distortion of a particles wave function. Velocity becomes statistically induced spherical vector (θ, φ, d), where d denotes the distance of the vectorial motion at a given collapse.

2. Collapse types

Firstly, I will propose two types of events in a quantum system. The first event will be a positional collapse, this is when the collapse of a particles wave function leads to a movement of a particle and possible interaction at that point (absorption by interaction of another particle). The second event will be a event of interaction or decay, such as the release of a photon as energy.

The shift between interactive (decay) vs. positional collapse is in accordance to the Lorentz transformation. This effectively introduces the concept of time dilation to quantum systems, without a fourth dimension being needed to represent time. The Lorentz transformation becomes a ratio between collapse types, rather than a shift of spatial velocity.

3. Wave stretching at high velocities.

Now we will again talk about the velocities of a particle. The velocities have become a vector shift of relative location of a particles wave with reference to its initial position. This is more clearly stated as, a particle's probability wave becomes distributed as velocity vector shifts.

4. Set collapses and Time

Here I propose that particles wave functions never truly exist in a superposition but as a state that is transitioning into another state at a very exact rate. The observed state of a superposition is a statistical grand simplification of the many states a particle in a closed system will transition through.

Here I must pause to define time as the very nature of these collapses. Not as a dimension, but as a discreet count of changes of states in a quantum system. This allows for a quantum time unit to be defined as an event for a particle.

Due to the collapse of two types, we now have two different "time"s. The count of collapses of interaction and the sum of all quantum collapses, though only the interactive time would be counted by an atomic clock as it is based of interaction of cesium atoms.

This now yields the effect observed as time dilation, as though any given particles local transitional sum would be the same with reference to an zero-velocity reference-frame's interactive-time, they would have symmetrically dilated their interactive-time due to the shifts of their wave type collapses.

5. Photon Application

The photon is the perfect starting point for application of these principles. Firstly we note that the photon is a massless particle, this means that the particle must either have no velocity or have a velocity of c. Now, according to the collapse types that we have defined, this particle must not collapse into any other state than that of motion. The only point at which a photon can be

“slowed” is when an interaction occurs. This interaction can only occur through the release of the photon’s energy when it is stopped.

Thus a photon can only interact by releasing its energy into another particle that then may interact due to it’s non-infinity-dilated interactive-time. This interaction only occurs when two particles positionally collapse into the same location. At this point the particles become one single wave with additive energies, this is the release of the photon.

6. Gravitational Field Effects

The effects of a gravitational field would be exactly the same as that of velocity, as according to relativity, acceleration is the same as gravitation, it can be handled as a velocity. Thus we would observe quantum time dilation in both strong gravitational fields and high velocity objects.

On Particles Modeled as Unions of Fields of Forces

Introduction

Here I will introduce an model of particles as unions fields at a given point, composed of the four fundamental forces. This model is designed to model particles as alignment of fields at a unified position, given the allusion of a particle. It models energy fields as forms of energy at different densities with differing properties of interaction.

The Forces

A particle may be defined with its most basic properties, the strength of its fields and its directional velocity. These fields can then be set in a tuple:

$$[E, S, W, G, V]$$

E (Electromagnetic force)
S (Strong nuclear force)
W (Weak nuclear force)
G (Gravitational Force)
V (Velocity)

V is a tuple in the format of (θ_x, θ_y, v), where θ_x and θ_y are spherical coordinates and v is the velocity.

Particle Field Unions

Here I propose that a particle is not truly anything material, but merely the origin of its field forces. This is to say that it is just a point at which all of its fields emerge from. These fields themselves are what make up the particle's being, their origin is the classical particle. This concept allows for a description of black holes that not introduce a singularity, when using a force model of gravity.

The fields propagate according to different functions and have different effects on neighboring particles, though it is worth noting that these fields may convert between each other and when using the energy mass equation of Einstein, we see that some have different densities (as long as we hold gravity being an intrinsic particle force rather than a spatial distortion.)

Particle Addition

When two particles pass into each others fields they *can* add, this process I have not fully worked out and is the most problematic part of the entire model that this part is a part of. The concept of addition is, when a particle passes past the local spatial vector of a second particle, where one of the vectors of the four field strengths of a secondary particle is stronger than that of the repelling forces of both particles, the fields of the two particles may combine and become a single particle with the added vectors of both particles properties.

The problematic part of this is that there should, in theory, be infinity many types of particles, at least potentially, though this could be eliminated with some form of field decay or a set of governing principles of field addition. This though, should be experimental confirmable in a particle collider.

Particle Motion

Motion is described through the system of transitions previously outlined and will not be fully dived into here. The motion of a particle with respect to a neighboring field is worth mentioning.

When is pulled or pushed upon by the forces of a neighboring particle, the force adds velocity thus changing the inputs to the particles transitional probability function.[1] This will change the behavior of a particle and, according the time relativity principle induced by quantum motion, this will also change the local time of a particle, just like gravitation in classical mechanics.

Field Types

Of the four fundamental forces some exhibit different properties of attraction and repulsion. Some exhibit polar behaviors, such as the electromagnetic force. We also know of the strong nuclear force, which changes in the direction of force application as it approaches a like field.

A gravitational field only seems to exhibit attraction, but it is on all particles, including those without its force such as the photon. This has lead many to believe it is a distortion of space-time, though we have already laid the foundation for why time should be removed from this mesh. It is also worth mentioning, when field particles are applied to black holes it removes the spatial

1 This is the non-superpositional term I use for a wave function.

singularity. Thus I ask for the reader to bear with me as I build what may seem an insane foundation, as when it is compleat the outcomes seem to be quite beautiful and lessen paradoxes.

The strong nuclear force exhibits a force that is attractive up until ~0.7 fm. at which point becomes repulsive. This force is unlike that of the electromagnetic force, as it does not exhibit a immediate bi-directional behavior at a given point, but a change in the directional application of its force as the fields approach.

The Electromagnetic force exhibits a polar behavior, in which with every force there is an inverse field, where like fields are repulsive and unlike fields are attractive. This is unique in most respects. The propagation for this field from an object with no velocity with respect to an observer, is also quite different from that of the other forces.

The weak nuclear force is one that I am not familiar with, thus I shall not write much on it.

In all these seem to all have very different characteristics, though if we treat them all as forces allow for us to model particles as union of these forces. This unions I shall refer to as field particles.

Black Holes as Field Particles

Introduction

Here I will use my model of particles as unions fields at a given point, composed of the four fundamental forces. Here I present the idea that black holes are merely particles in which there gravitational field force has exceeded the repelling forces, and pushed its Schwarzschild Radius beyond the point at which the repulsing forces overcome its gravitational force. This interpretation allows for the treating of black holes as single particles. This removes the concept of a singularity in the classical sense of space (see “Singularity Removal”) and makes them merely a particle with an origin point.

This is built off of the foundation of non-spatial-distorting gravity as a force and Quantum Time (through discreet transitions).

Singularity Removal

Here we will use the principle of field addition. This means that when matter enters into a black hole it is not lost into it but absorbed as part of its particle field, i.e. the fields of both particles are added. This provides a simple explanation for the growth and intensification of a black hole’s gravitational field. This approach also removes the concept of a singularity in space where dimensions have bent into a single point.

When a particle approaches a black hole, we observe the inward pull of the gravitational field. As the particles falls into the black hole we may treat it as an addition of the fields, i.e. when the particles enters the center of the black hole its wave becomes synchronized (added) with that of the black hole.

This now becomes a release of energy of the particle into the black hole. This is due to the magnitude of the black holes gravitational force being the stabilizing force of the particle, meaning there isn’t an escape energy due to the gravitational stability overcoming opposing forces.

This is a non-paradoxical black hole as the singularity of space is removed and the concept of infinite density is made meaningless. Albeit this does pose problems for the concept of Hawking Radiation, namely rendering meaningless. The conflicts with modern predictions though are only

with those that are unobserved. This means, unless firmly proven, there is no real contradiction in reality, but merely in theoretical model lacking confirmation.

Non-Gravitational Black Holes

One of the implications of this interpretation is, if a particle has very strong, strong nuclear force caused by addition, there may arise a strong nuclear force black hole. This principle applies to all of the fundamental forces. Thus giving four possible types of black holes.

Conclusion

These are the natural implications of field particles and quantum time, along with gravity as a force rather than spatial distortion. This one of the reasons why I believe this model is more favorable, compared to the current standard model.

Expanded Time Dilation Through Field Particles

Introduction

Here I will expand the concept of quantum time dilation through transitions, with the inclusions of the concept of field particles. This is the built off of the concept of non-spatial distorting gravity.

Forces Inducing Time Dilation

Any force that can change the velocity of a particle may change the local time of a particle. This implies that any of the four fundamental forces may induce time dilation within their field. Meaning any force that distorts the velocity vector of a particle, or macroscopic object, will also change its local time.

Electromagnetic Time Dilation

The local time of a particle that is pulled upon by a magnetic field should experience time dilation, when placed within a magnetic field. The time dilation should be equivalent to the Lorentz transformation, where v is the velocity that would be applied if a particle was unhindered by an opposing force, at a given instant in time. This should be experimentally confirmable under a strong magnetic field where by measuring the decay of a particle that is attracted toward the origin of the magnetic field.

Time Dilating Force Equivalence Principle

Here I must propose a simple rule: Potential velocity, as applied by a force, is velocity with respect to a local body's time, due to a shift in the transition probability of a particle. This rule is the fundamental rule of time.

The more familiar meaning of "Potential velocity…is velocity with respect to a local body's time…" is to say that, the potential velocity applied to an object is the velocity that must be used to calculate that objects relative time, when seen to lack velocity from a neighboring observer's reference frame. This rule means that any force will dilate the local time of a particle. Thus within a

single reference frame, there exists another reference frame for every point at which a field has a differing intensity in that field at any other point.

Equivalence for Gravitation

Here I must introduce the variable v_U to denote the sum of potential and true velocity, i.e. the true force applied to an object, thus named Universal Velocity.

Time Dilation Equation (Example)

Note that, this is a very rough prototype and is designed to represent the concept rather than provide a real equation.

Note that here I cap v_U to c as this is the result of this interpretation of time, i.e. universal time is constant. Thus if we allow for a particle to have a velocity above that it not moves faster than transitions occur, which violates the foundational principle of this interpretation of quantum transition.

Time Dilation Equation (Example)

These concepts will be experimental verifiable or easily disproved, by measuring decay rates of muons in a high energy electromagnetic field. This is what I aim to solve when I have fully worked out the force-velocity equivalence equation for electromagnetism.