Die Hypothese der Fütopi

«Die Welt zwischen null und eins»

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Abstract

(same as in the e-mail, just originally indented section are replaced with list)

Here we're proposing an idea, that everything's every property (or what we referred as dimensions) like position, heat/temperature, are all described by three variables, S, N, and A from the perspective of the observer that's observing the object. Which:

- S, is the value the observer has observed.
- N and A are used to describe the observed object's perspective. Where N is like origin and A-N is the unit length. So the value of the object that the object itself observes will be (S-N)/(A-N).

And if the value of the object follows any kind of equations (maybe like free fall equations), the equation will have to use the value that's observed by the object itself, which is (S-N)/(A-N).

So for example, Bob are measuring Alice's height. Bob uses metric system, while Alice uses Imperial system. Then Alice's height will be represent as {S=160,N=0,A=2.54} which basically mean Alice is 160 unit length (cm) to Bob's perspective, and (160-0)/(2.54-0) (inch) unit length to Alice's perspective. In this case it seems like we're just changing units, and basically we were. But you'll have to remember sometimes those two perspective will share the same unit *name*, like in Special Relativity, objects both share the same unit same (second) while they aren't the same. And also the perspectives over time might not be same itself, like how if Bob is driving a spaceship that's originally traveling at 0.5c and later accelerates to 0.9c, though both "second" in those two time are measured by Bob, they're different. Hence perspective of the observed object may also change over time, and that's why we're also considering them as variables rather than constants.

With knowing how to describe any property with three variables, now we can map those three variables into the 3-axis in a chaotic system and see if chaotic system can explain why quantum phenomenons exists. The idea here is chaotic system will describe how S, N, A changes over time, which can then used to calculate the value of a specific property of a quantum object. And how the object (or the property of the object) is effected by other things (like environment or observation) is described by changing chaotic system's system parameter over time.

Which if we say any object (or the quantum object in this case), receive a value E from the environment, which is the sum of the existence proposed by other objects toward the quantum object. The idea of existence may be a little unclear of what it actually is, so let's just say E will be very high when the quantum object is observed, and E will be very low when it isn't being observed. Since normally we can't sense the existence of a quantum object (like electrons), hence the electrons when non-observed receive low existence value, and vice versa. Like I mean, for example electrons, we know they exists, but where they are? We actually don't know. Yet when we put up a detector, we can easily say that "Oh, an electron just passed by".

And what we find is that chaotic system have a similar behavior like quantum objects if we describe things in this way. Some chaotic systems (like Lorenz System, Rössler Attraktor) have a system parameter that decide whether or not the system is chaotic or will it just evolves toward fixed point (which for quantum objects, E decides whether the quantum object can be in superposition, or will it just collapse). Lorenz system, for example, requires rho greater than 24.74 to be chaotic. So if we say that rho is inverse proportion to E, we can explain why quantum objects can be in superposition (chaotic) under small E, and collapse (evolves to fixed point) when under large E.

By modeling things in this way, if we look at double-slit experiment, we're saying that maybe particles doesn't have to pass through both slits at same time in order to create the interference pattern. Instead, perhaps the fact that there are two slits, is enough to create interference pattern. Maybe the decreasing of E cause by creating two slits, is enough to send chaotic system into chaos and later generates interference pattern.

And what we find is that chaotic system have a similar behavior like quantum objects in this way. Some chaotic systems (like Lorenz System, Rössler Attraktor) have a system parameter that decide whether or not the system is chaotic or will it just evolves toward fixed point (which for quantum objects, E decides whether the quantum object can be in superposition, or will it just collapse). Lorenz system, for example, requires rho>24.74 to be chaotic. So if we say that rho is inverse proportion to E, we can explain why quantum objects can be in superposition (chaotic) under small E, and collapse (evolves to fixed point) when under large E.

Prescript: What are we trying to achieve

We're trying to build a theory, or a template, that can describe everything (aka Theory of Everything, TOE). We know currently scientists are trying to build a TOE base form quantum mechanics (hence trying to describe general relativity in a quantum way). But since until now, scientists are still working on it, I think why not just try the other way, I mean it hasn't been completely proven impossible, so it worth a try. Which led me to setting the goal to develop a theory that's both classical and continuous (and that's pretty much why we have the third concept in the next chapter, though it still have plenty stories behind those decision, but it's not technical thing, so just take it as a preference).

Core Concepts

Here we're proposing a way, of how the world might actually work. And here's what we came out.

1. First, everything have a value ***E*** which is their existence, (something like the total energy of an object, but not necessary limited to energy). In short, ***E*** means how much an object is influencing or noticed by another object. So sun has an enormous ***E*** during daytime, while a smaller yet still consider large ***E*** during night time considering we didn't see it directly yet its influence is still there (for example, tides).
2. Second, everything has their perspective, the way they see the world, denoted as ***N*** and ***A***. Where ***N*** is like the origin and ***A-N*** is the unit length. And their current position ***P***. In following plots, ***P*** is used to denote the position we observe (if can without collapsing it), while the position of the object that's been observed by themselves will be $\frac{P-N}{A-N}$.
    1. Also if an object follows a physical equation, the parameters the equation is using has to be the value that's been observed under the object itself perspective. Just like in Special Relativity we consider the length the object itself is observing as their real length.
    2. And if any two objects want to interact with each other, they're require to have a rather consistent if not fix ratio between their perspective during the time they're interacting. Which means when two people are talking about the length of a thing, both of them can double they're unit length at same time. But one can't just change its unit length without noticing another, cause it'll make the conversation meaningless, even you two have a unit conversion equation at the very beginning, it'll be broken since you change your unit length without noticing others.
3. Last, the hypothesis has some basic preference on how the world should work, including:
    1. Everything should be continuous
    2. All dimensions (parameters) are equal, including time, space, heat/temperature, etc. In following chapters, we'll be plotting (describing) 1-parameter per system (though the system is 3-D).

With these concepts in mind, we can try to explain why quantum phenomenons exists.

Why Quantum Mechanics is different from Classical Physics

We suppose quantum objects might be able to describe using chaotic system, since by using chaotic system's property – *sensitive to initial condition* – we could easily explain the quantum randomness[1].

So we think that the cause of which quantum object doesn't behave like what classical objects does, is because they don't have similar value ***E***. If we model object's parameter (like spins) as a chaotic system (and let's take Lorenz system now for example) with their three variables ***P, N, A*** maps to three axis. Then let ρ in the Lorenz system if inverse proportion to ***E***. Since in Lorenz system ρ has to be larger than 24.74 to be chaotic, otherwise points will just evolves toward one of two fixed point, we can see why ***E*** might take an important role on causing difference between classical physics and quantum mechanics.

And since, the two fixed point isn't simple determined by ρ, we can bind other system parameters (β in this case) to be related to maybe equations like equations of motion, to generate the view of our normal macro world.

Now we know ***E*** matters on how an object behaves, but if we construct the system good enough it's actually possible to make the system to behave differently when ***E*** is in different range. So maybe we can make so that when ***E>1*** it will evolves toward fixed point meaning the particle is being constantly observed, therefore remain classically behaved. And when ***E<1*** depending on how much smaller it is, we can make it have different amount of attractors. By referencing to chaotic systems such as *Modified Chua chaotic attractor*, we could make out patterns that are like interference patterns. Though due to the fact that functions are all continuous, we aren't able to create completely destruction points, consider in particle double-slit done by Veritasium[2] do have photons that actually enter destructive points rather than completely none, we think it isn't a problem.

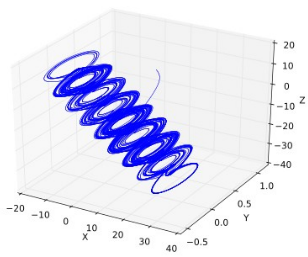

Figure 1:
Shiyu Ji / CC BY-SA

What we find by playing with Lorenz System

In the following chapter, we'll try to see if we can simulate a qubit's behavior with a classical dynamic system. We'll use Lorenz System this time, with x, y, z-axis representing the value of three variables (***P, N, A***). Notice that we're using Lorenz system here not because it can actually simulates how one qubit behaves, but rather for an idea on how we might be able to form a chaotic system (or dynamic system) that can predict how quantum objects behave.

Before formulating qubit with dynamic system, let's clear a few ideas first:

1. Point ***P*** represent the current state of a qubit

1 Even though if considering this hypothesis is used as Theory of Everything, other non-quantum physics rules may be described using non-chaotic dynamic systems, since our topic here is quantum, we'll just be saying chaotic system.

2 YouTube Video (jumped to middle): https://youtu.be/GzbKb59my3U?t=209

2. In the following chapter, we'll be plotting single qubit on a 1-Dimensional line. The line indicates what **we** see. So the value of ***P*** (or the z-axis) represent the value we see (or we'll see if we can observe them without collapsing).

3. The state that qubit itself sees is $\frac{P-N}{A-N}$, so if the qubit actually follows any classical physics law, the equation will have to use $\frac{P-N}{A-N}$ rather than just ***P***.

Okay, now let's start modeling the qubit. First we'll be plotting three points, P, N, and A on the line. So from our perspective (which also equals to God's view in this case) the state of the qubit is the position of point P. But from the qubit's perspective, its state is actually $\frac{P-N}{A-N}$.

Now when we observes the qubit, we increase the existence ***E*** that the qubit is receiving, which should cause the following things to happen:

1. ***N*** and ***A*** will approach and at last equals to the ***N*** and ***A*** value of human, which indicates that human and the qubit are interacting.

2. P will approach to either ***N*** or ***A*** (at least in this case, since single qubit can only be 0 or 1 when observed)

which basically, in a dynamic system, means converging to the fixed point.

So I simulated a Lorenz system, using following equations (slightly modified).

$$\frac{dx}{dt} = -\sigma(x+y) \qquad \text{(Equation 1)}$$

$$\frac{dy}{dt} = -x(\rho - 2z) - y \qquad \text{(Equation 2)}$$

$$\frac{dz}{dt} = \frac{-xy - (2\beta z)}{2} \qquad \text{(Equation 3)}$$

Then we'll remap the value of axis to our predefined variables, so ***P=z***, ***N=x***, ***A=y***. Now plotting it over time with ***N*** in blue, ***A*** in red and ***P*** in green, we get:

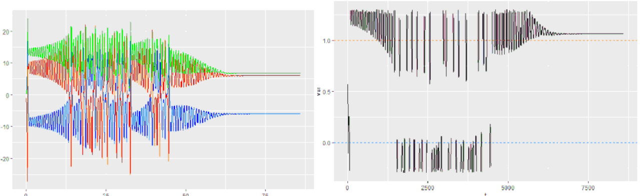

Figure 2: Initial Position: (1,-1,0.5)

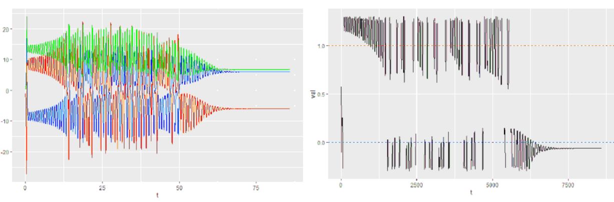

Figure 3: Initial Position: (1,-1.001,0.5)

* The colorful plot is plotting 3-axis over time where P=green, N=blue, A=red, and the black plot is plotting the object's perspective over time. By looking at the object's perspective plots, we can that there are some missing points, which were caused by division by 0, and a real system that are attempt to describe quantum mechanics should be coded to prevent such situation to happen.

In the plot ***E*** starts to increase when ***t>36*** and maximized to a fixed value when ***t>63*** (which basically mean the detector is at t=64, or anywhere that's near and bigger than 64). And if we say that when ***P*** is near ***N*** (blue) we'll observed the qubit as 0, and when it's near ***A*** (red) we'll observed as 1. We see something that's like qubit, which a little unnoticeable difference at initial condition, could generate different result. Given that human operations have tolerances, we can say that for same qubit that given different results may just be the fact that we can achieve perfect precision. Even for entangled qubits, which basically should have complete, infinte precise opposite state, will face human tolerance issues when they're being observed, as the observation is actually also part of the chaotic system. And we can't say that our detector is actually precisely detecting specific axis, even we're reusing the same detector.

Although chaotic system's *"Sensitive to initial condition"* isn't a new thing, here we're proposing a way that we might be able to simulate quantum object using this property. Cause at the very first time I see this property I've been thinking that maybe quantum mechanics is just something like this. But it actually take a while to figure out how might a quantum object be described by continuous chaotic system, since as we know continuous chaotic system requires at least 3-Dimension, but meanwhile we're only modeling 1 object's property.

But now, if we describe the object with its state and its perspective, plus physical laws should use the state that the object itself observed, makes it seem possible to formulate a 3-D chaotic system, with 3-axis inter-related to each other. As the perspective might change base on where the object is, and the equations that determine where the object is requires the position observed base on the object's perspective.

How might we be able to maintain local realisum

Bell's inequality has been denying the possibility for a local realistic hidden variable theory to exists. But from what I learn, Bell's inequality proofs that hidden variable theories require faster than light communication between two quantum entangled object in order to maintain the result observed from experiments. Meanwhile, the theorem looks great, but it seems that the experiments proofing Bell's theorem is using the fact that they observed two entangled quantum object within a time range so that light won't be able to reach another quantum object since it was observed. But if we take the thought of existence into this experiment and also that the world should be continuous, it'll seem obvious that the quantum object should be able to know that the sensor is there, oriented in which direction, before they even being observed. Which gives some room for light speed communication be achievable.

Also we've said that when not under observe, quantum objects' perspective may change, so even on their perspective they aren't moving, in our perspective they might simply be moving. And that's what happens when we plot the spatial position of the quantum object. What if we plot the time line of the quantum object? If time also follows these rule as all other parameters does, then it won't be surprise if the time of quantum objects and the time of human beings are different. And not just like what relativity does, which only multiply the unit time, the time in this situation might be stretched or squashed randomly, which might also give more room for the communication to be possible.