Photons as High-Voltage Decoherence Power Lines

Terry Bollinger
2023-09-24.14:30 EDT Sun
https://youtu.be/wXJ9eQ7qTQk&lc=UgzCqfVhPq9J0ucvFkB4AaABAg

A Comment on the Arvin Ash (YouTube) post:
How Quantum Mechanics produces REALITY & perhaps ARROW of TIME | wave collapse & Decoherence (May 22, 2021)
https://youtu.be/wXJ9eQ7qTQk

Arvin Ash, I found this video while researching your 2023-09-16 quantum eraser revision update. It's been over 3 years since I did my last deep dive on Zeh and Zurek, and I'd forgotten how frustrating decoherence was. They started strong and went a bit catawampus, which is the source of my frustration. Yes, Boltzmann-style thermal-complexity entanglement is absolutely part of what makes classical reality a "thing" that becomes stable over time. No, that is *not* what quantum collapse is; it's not even close. However, since the framework required to explain collapse requires some major flips in what's fundamental and what's not, decoherence at least did a great job of recognizing the Boltzmann thermal complexity connection.

An analogy, nothing more: Stick a metal fork in an American electrical outlet. (We like to live dangerously here.) What happens? You die, most likely. Did the socket kill you? No. Did the wire leading out of the socket kill you? No. The transformer? No, not really, though that unit is getting closer. So where did your demise originate, really? In a power generation plant that may be a thousand miles away. Hmm.

Photons are like light sockets and thermal decoherence is like a power plant. While one photon has negligible energy and momentum, entanglement links it into an enormous, deeper, and less time-driven reservoir of statistically irreversible thermal entanglements, such as the entire Earth.

That enormous reservoir of statistical irreversibility *behind* the photon, tied to it via entanglement, gives the photon the ability to "electrocute" a wave function of unimaginably larger mass and energy. Getting a large object into a quantum state takes a lot of work. Still, given that molecules as massive as three DNA codons can double-slit interfere like photons or electrons, the upper limit appears to be one of increasing difficulty, not absolute boundaries.

The difficulty is provided by all of those wired-up photons zipping around. They get astronomically harder to dodge as objects grow in volume, and *every one of them* has the thermodynamic complexity of at least Earth behind it, ready to zap the bejeebers out of any expanding wave function and thus force it to take up a specific location within the xyzt standards of Earth's inertial frame.

No combination of xyzt maths can explain the zapping process, that is, the wave collapse process. That part happens outside of the space-and-time structure of individual inertial frames and could care less how we think it should behave. Although the deeper but rougher network of causality behind thermodynamically asymmetric collapses stays rock

solid, it's not possible even to postulate what collapse is, let alone explain it, while insisting that *your* time and *your* space is anything more than a local-only paint-over that pretties up the deeper and (mostly) irreversible causality network.

The other difficulty with standard decoherence theory is that it has the order of events backward, at least for most collapses. Growing your own thermal-complexity stabilization network at one end of an entangled pair is the slowest and most fragile way to zap a wave function, and it is, indeed, often reversible if the number of moving parts is low enough. What's missing is recognizing the *existing* power of, say, photons *already* entangled with vast and utterly irreversible thermal entanglement bodies such as Earth. It's all those photon-sized dangling powerlines, backed up by truly enormous, utterly irreversible, ready-to-zap thermal entanglement engines such as entire planets that make large quantum functions of anything other than photons so highly prone to collapse — which, again, is a process *outside* of any one xyzt space.