The Surprising Implications of Acceleration as Wave Collapse

Terry Bollinger
2022-04-25.22:55 ET Mon
(Gmail excerpts)

2022-04-24.09:06 ET Sun (Hypothesis from prior email in thread)

> Subject: Wave collapse: Not just gravity, accelerations
>
> Wave collapse is the conversation of paired off-shell boson absorptions into on-shell particles moving in new inertial frames. Acceleration *is* wave collapse. Good ol' Newtonian action-reaction is the measurement, since each particle gains information on the other. It's the most common physics event in the universe. Pair-*asymmetric* gravity is a special case, though... intriguing.

2022-04-25.22:55 ET Mon (Main email assessing the hypothesis)

(Unexpectedly, this self-critique ends in a nicely data-fitting dark matter hypothesis)

<u>Self-critique</u>:

(1) Wave collapse is the most frequent event in classical physics.
-- This is just true, unless one prefers nonphysical mysticism.

(2) Collapses come in pairs due to action-reaction frame-pair creation.
-- Intriguing but insufficiently quantified.

(3) Consistency of frame-pair idea with field theory.
-- Lousy, though some variant of the old Feynman-Wheeler advanced-retarded photon pair model might model the idea.

<u>Conclusion</u>:

Something is missing: A pair symmetry not captured by field theory.

<u>Postulates</u>:

(1) <u>Reduction equals acceleration</u>
Every classically-observed wave reduction -- not necessarily a full collapse, but any reduction to create new information as to the location of the particle in xyz space -- adds a tiny bit of fully on-shell momentum (acceleration) to the observing particle or system.

Since the magnitude of this *linear* momentum transfer is not quantized, its magnitude may be tiny indeed and hard to detect experimentally unless repeated in vast numbers, e.g., photons on light sails.

(2) Cryptic wave-collapse pairing
For each classically-observed wave collapse, there exists somewhere in space-time an equal and opposite, fully on-shell, momentum partner to in another classical inertial-frame object. The location of this partner is Lagrangian and not subject to classical time order constraints. That is, the momentum partner of the observed wave collapse may reside in the past, horizontally in the present, or in the future.

Sub-hypothesis: The on-shell momentum absorption is a special relativity effect that applies to the all (local) mass in the partner inertial frame. Thus while the recipient unit can be and most often is another particle, e.g., for inter-atomic thermal jostling, it can also be a large classical object such as an interplanetary probe using a light sail ("Marman absorption").

The additional huge dilution of an already small momentum unit in the case of classical object absorption further increases the difficulty of detecting individual wave-reduction partner events. Again, however, very large numbers of closely similar events, as in the existing well-documented case of light sails, should be readily detectable.

Implications:

(1) This is testable. For example, in the classic Stern-Gerlach experiment, if two separate and extremely sensitive lateral momentum detectors are placed in front of each of the two silver atom deposition lines of the spin one half space pattern, both should detect an outward momentum unit each time one of them also detects an atom.

Since silver atom deposition would quickly destroy sensitive momentum detectors, one example of a better and far more state-of-the-art approach would be to use hypersensitive momentum detection equipment [1] in combination with some variant of entangled photon imaging [2].

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[1] Gadi Afek, Daniel Carney, and David C. Moore, *Coherent Scattering of Low Mass Dark Matter from Optically Trapped Sensors*.
Phys. Rev. Lett. 128, 101301. Published 9 March 2022.
https://link.aps.org/doi/10.1103/PhysRevLett.128.101301

[2] Sebastian Töpfer, Marta Gilaberte Basset, Jorge Fuenzalida, Fabian Steinlechner, Juan P Torres, Markus Gräfe. *Quantum holography with undetected light*. Science Advances 8 (2), eabl4301, 2022.
https://www.science.org/doi/10.1126/sciadv.abl4301

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(2) Entanglement affects space curvature. Schrödinger wave functions, both the uncollapsed versions and ones in which the other end is still in the future, have real, measurable energy in the form of cryptic momentum. Until both ends of the pair are classically reduced, this energy shows up gravitationally as an extremely diffuse and ever-expanding pattern within the light cone of some initiating event such a photon emission.

For cases in which no detection of the particle has occurred yet, this pattern includes both the mass of the particle and the energy of potential momentum pairs.

The more interesting case is when a particle has been found but its momentum partner has not yet resolved, since this case represents an exceptionally diffuse and cryptic form of energy residing within the light comb of the initial event.

In short, Schrödinger wave functions are not just bookkeeping devices. They have space-impacting momentum energy and convert into pairs of canceling momenta by creating new pairs of inertial frames.

One quick name for such diffuse fields of incompletely unresolved wave functions is *entanglement energy*. It captures the idea that entanglement is a quite real phenomenon, albeit one that is both exceptionally low-energy and not fully bound by classical time.

(3) Dark matter is very likely entanglement mass. There's another more interesting way of saying that: About 80% of the mass of our universe is a quantum computer devoted entirely to calculating the future trajectories and behaviors of the fermionic matter that we can see. Leibniz had good reason to be impressed by the variational principle.

In any case, entanglement energy fits the dark energy profile strikingly well. It is exceptionally cryptic, never shows up as a particle, and is far more likely to occur in low-quantum-collapse-rate deep space than in the vicinity of stars where abundant thermal processes quickly drive any open momentum pairs into full closure.

(4) A merger of cold dark matter and MOND models is probably feasible.
Many of the data-fitting advantages of MOND should also fit well with entanglement energy. With entanglement energy, space becomes heaviest when matter is close enough to create numerous open momentum pairs that are anchored by fermionic matter at one end, but not so close that the thermal radiation and chaos of hot matter closes the pairs too quickly.

(5) Dark matter can be created and tested in labs. We've been playing with lab versions of dark matter ever since folks first created and tested quantum wave functions in the 1920s. The only trick is to realize that every wave collapse is a binary event, and so remember to look at the other side for the other side of the wave function for the quite real momentum that shows itself there.

If Physics is a magician she's very good at it, since the heart of every good magician's trick is to get people to look in the wrong direction at the right time. She may have had everyone hoodwinked on this one for about a century now.

(6) Gravity may involve time-only quantum pairs and a "contraverse". Acceleration due to gravity is a special case since the momentum partner in that case is cryptic. However, if there is a contraverse to our universe -- and by "contra" I mean one with negative-energy fermions moving geometrically backwards to our time, *not* one made of antimatter fermions (not an "antiverse") -- then the simplest partner for time only wave collapse would be the contraverse to our universe.

Despite its location 26 billion years backwards from our location in time, it might even be possible to build a telescope to image aspects of our contraverse partner by using a time-only variant of entanglement imaging.

(7) Dark energy would be the field pulling our universe and its contraverse apart. This is a separate topic [3]. I've been calling this the "ereboic" field.

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[3] Bollinger, Terry. *On Quantizing General Relativity: An Overview with brief notes*. https://sarxiv.org/apa.2022-04-21.pdf

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