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BRIEF REPORT

A Method for Demonstrating Superluminal Communication Using Conscious Intent to Influence a Quantum-Entangled Link

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HIGHLIGHTS

Quantum entanglement might allow faster-than-light (or 'superluminal') communication but only with a very low amount of data transmitted per second.

ABSTRACT

It is fair to say that Bell's Theorem leaves a nasty taste in the mouths of many physicists because test results seem to suggest that non-local, i.e., superluminal, communication of some sort is going on all around us and maybe not just at the quantum level. But Bell's Theorem has been aptly demonstrated to date, and Quantum Mechanics (QM) is, if not the most successful theory devised by man, certainly one of them. To some, and especially to Einstein, one of the least favorable aspects of QM is its statistical nature. This paper embraces QM's statistical nature and employs quantum entanglement to show that superluminal communication may be possible albeit, most likely, initially, at a very low bit rate

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INTRODUCTION

This paper makes use of two key experimental setups. The first is a thought experiment described in Nick Herbert's book Quantum Reality (Herbert, 1985). In it, he makes use of a quantum entangled randomly polarized photon interstellar link to explain the Einstein-Podolsky-Rosen (EPR) paradox and Bell's theorem (Herbert, 1985, pp. 199-231). The second makes use of almost three decades of data gathered through the Princeton Engineering Anomalies Research (PEAR) lab and others, suggesting conscious intent may be capable of modifying a quantum entangled randomly polarized photon stream.

In Nick Herbert's thought experiment a spaceship acting like an "interstellar lighthouse" midway between Earth and Betelgeuse (540 light-years away) directs a Green light beam towards Earth and a Blue light beam towards Betelgeuse. The spaceship only emits correlated (entangled) pairs of photons; one Green, one Blue, and the attribute measured at each location is photon polarization. When measured at the same angle, their polarizations always match; when measured at 90 degrees to each other, they always miss. At angles in between, the result is probabilistic. The detector stations at Earth and Betelgeuse use calcite crystals to set the measurement angle – vertical polarization results in the UP detector being triggered; horizontal polarization results in the DOWN detector being triggered (For a more detailed explanation of the measurement setup, please see (Herbert, 1985, pp. 139-141).

Now to quote directly from his discussion on superluminal signaling (Herbert, 1985, pp. 238-239):

> In the EPR photon lighthouse, the natural quantum process that blocks [superluminal] signaling is quantum randomness. Put yourself on Betelgeuse with Blue observer. No matter how she sets her Blue crystal, she receives a message from the central spaceship which consists of a 50-50 random pattern of ups and downs. When Green observer on Earth moves his calcite we know (via Bell's theorem) that his actions must change Blue's sequence of marks. Some of her ups change to downs and vice versa; if this did not happen, the correlation would be weaker than is in fact observed. However, these changes in the details of Blue's marks involve a shift from one random pattern to another equally random pattern. Since all random sequences look alike .... Blue is not aware of this Green initiated change. The situation seems to be that Green can send superluminal messages but Blue cannot decode them."

Everything up to this point is as expected and well known – superluminal messages using entanglement are hidden by quantum randomness, and to quote from above "... all random sequences look alike." But do they? Look what happens if we introduce a "gremlin" into the system, i.e., something that has an effect that is unlikely and difficult to control but not impossible.

THE PAULI EFFECT

There is some, typically anecdotal, evidence that suggests that some people may have the ability to influence electronic equipment and machines in general, whether intentional or not. It is said about Wolfgang Pauli that he could merely enter a laboratory with sensitive electronic equipment and cause that equipment to fail. People who knew and worked with him referred to it as the Pauli Effect (Radin, 1997, p. 131).

Another potential example of the Pauli Effect was described by James McDonnell, the patriarch of the McDonnell Aircraft Corporation. He noted that there had been so-called "gremlins" observed in [presumably the electronic systems of] aircraft under test during very emotional circumstances (Chene, 2021). He was so concerned about this problem that in 1979, he provided funding to Dr. Robert Jahn, then Dean of the School of Engineering and Applied Science at Princeton University to study it. From this funding, the Princeton Engineering Anomalies Research laboratory was born and continued its work until 2007. During this period, a large body of data was collected primarily using computer-controlled random-event generators (REGs) that are essentially electronically generated coin flips. This data seems to indicate human consciousness can have a small but very definite effect on random processes as a proxy for non-local human/machine interactions (Dunne et al., 1992; Jahn, 1982; Nelson et al., 1996). Besides the PEAR data, a limited number of other experimenters over many years using REGs as well as dice have found similar results (Radin, 1997, pp. 133-146).

If we look at just the PEAR data, results from their "benchmark" database of REG studies comprising some 750,000 trials per intention and 91 operators, an average effect size on the order of 1 per 10,000 bits is observed (Dunne et al., 2005, p. 706) and for a 'gifted' operator 2-4 per 1000 bits (Jahn et al., 1987/2009, p. 102).

> In fact, when the results of thirteen distinct experiments encompassing a variety of random and pseudo random noise sources comprising a total of nearly six million trials, are combined in a meta-analysis, the overall correlation with operator intention exceeds seven sigma ($p = 6.5 \times 10^{-11}$). (Dunne et al., 2005, p. 707).

Clearly, something is going on. Although we may not have a good understanding of the phenomenon, can we make use of it?

Many of the typical criticisms of this type of research are discussed in Margins of Reality (Jahn et al., 1987/2009, pp. 49-55). In particular, the book states "Without question, the dominant experimental frustration in this field is the inability to replicate on demand previously observed anomalous effects, not only at other laboratories with other participants, but even in the original facility, using the original participants, under apparently identical experimental circumstances." This is further addressed in (Dunne et al., 2005, pp. 707-708), where failed attempts at replication at other laboratories are discussed in some detail. Clearly, not being able to replicate results on demand is a major concern.

If for the moment, we don't concern ourselves with how gremlins do what they do or the difficulty of inserting and controlling them and instead, we just assume that we can make use of them, then let's see what effect they have on the scenario described earlier with the interstellar lighthouse thought experiment.

A GREMLIN IN THE SYSTEM

Once again, we note that no matter how the Blue observer sets her calcite, she sees only 50% ups and 50% downs (50/50) in a random sequence of ups and downs from the spaceship. The Green observer changes his calcite, and we know that his actions change Blue's random sequence instantaneously, but it is still random, and no information is sent.

Now imagine that we have a gremlin toggle switch controlled by an experienced operator, which when ON, releases a gremlin into the system to do its thing, and when OFF, retrieves the little mischief maker so it can do no harm. We flip the toggle switch, and a gremlin is let loose into the Green measurement system on Earth. This gremlin has the ability to affect the random received photon stream such that more ups than downs are received. But it takes 20 minutes (say) to achieve a clear and statistically significant change in the random sequence from 50/50 to > 50.1/49.9 (say) ups/downs cumulative average that Blue observer can detect. As this shift in the mean occurs at Green station, it also instantaneously appears at the Blue station on Betelgeuse, where it is detected as a statistical anomaly. We now toggle the gremlin switch to OFF. The random sequence goes back to 50/50 ups/downs, which is instantaneously transmitted to the Blue observer as well. If we let the 50.1/49.9 random sequence equal a '1' bit and the normal baseline 50/50 sequence a '0' bit, we can now communicate superluminally with Blue observer on Betelgeuse 540 light-years away.

IMPLICATIONS AND APPLICATIONS

This paper makes use of two key experimental setups to show that superluminal communication may be possible. The first is a thought experiment employing a quantum entangled randomly polarized photon interstellar link between Earth and Betelgeuse. We know from Bell's theorem that if we measure or manipulate the polarization of one photon on Earth, it's twin will be affected instantaneously on Betelgeuse. (See, Rauch et al, 2018 for the latest Bell test and results.) However, communicating over this superluminal link is, as far as we know, blocked by quantum randomness. The second is the PEAR lab data which gives a strict methodology for modifying the mean of a random bit stream using conscious intent. This paper is a thought experiment that combines the two – a randomly polarized quantum entangled photon stream modified by conscious intent to thwart quantum randomness, thereby creating a superluminal communication link.

Through conscious intent, an experienced operator may be able to influence random processes making them statistically different within a reasonable time period. These differences can be used to send 'bits' superluminally on an entangled communications link. Unfortunately, until we find better operators or somehow train operators to be more proficient, the bit rate of our superluminal link is only on the order of 3 bits/hour, if that!

To reiterate, superluminal communication should be possible if we allow ourselves to take an unconventional approach to the problem. The work of pioneers like Dr. Robert Jahn, Brenda Dunne, and others, with their rigorous scientific study of non-local human/machine interactions, suggests that we are responsible for the gremlins in our systems. But can they be controlled, and will they perform on demand? For the moment, the answers seem to be 'maybe' and 'unlikely'. We know replicating results on demand and at other labs has proven to be elusive. Until the replication issue is adequately addressed, it is difficult to see "conscious intent" being used as a tool in an otherwise mainstream physics experiment employing quantum entanglement, which, no doubt, in itself, is difficult to do.

However, mainstream physics has its own issues with consciousness. One such issue is described in a recent New Scientist article as follows. "... But physics, which aims to describe the universe and everything in it, says nothing about your inner world. ... our brains are made of matter – so, you might think, the states of mind they generate must be explicable in terms of states of matter. The question is: how? And if we can't explain consciousness in physical terms, how do we find a place for it in an all-embracing view of the universe?" (Lewton, 2022, p. 38).

In the author's humble opinion and not being a member of either community, perhaps it is time for psi researchers and physicists to tackle the problem of consciousness together by sitting down and comparing notes.

My purpose in writing this paper is simple: to challenge the view that communicating superluminally over a quantum entangled link (i.e., the type of link described in Nick Herbert's book) is impossible. It is formulated as a thought experiment, but I would expect an actual test of the concept in some fashion could be performed, perhaps, even, without the need for gremlins – though I don't know how.

FURTHER THOUGHTS

A. At first glance, it may seem ridiculous to propose an experiment for long-distance communication that does not even achieve the bit rate of a Morse code telegraph link. However, in the future, when we wish to communicate with a remote platform in space that could take messages days or weeks, or even years to reach at the speed of light, a few bits per hour without transmission delay would be a dramatic improvement.

B. To better discriminate between the two binary states, we could use a gremlin that is good at causing more ups than downs and another that is good at sending more downs than ups. Using a single gremlin that, on command, could shift the mean up or down within a given 20-minute test period would be the best.

C. The PEAR experiments could be run at various bit rates (also referred to as "counting" rates, or "sampling" rates) at the discretion of the operators. These were 10, 100, 1000, and 10,000 b/s. It may seem that the higher the bit rate, the faster statistical significance could be achieved. I am certainly not an expert in the running of the PEAR experiments or in the analysis of their data. But my reading of their literature suggests that increasing the bit/sampling rate beyond a certain point (which appears to be 1000 b/s) either makes a negligible difference or is unpredictable in its effect or they did not have the time to properly study its effects. (Jahn, 1982, p.149; Jahn et al., 1987/2009, p.99, p.114); (Nelson, 1996, p.113). The more important parameter, I believe, is an operator's proficiency in flipping bits in a bit stream. As mentioned previously, this varies from 1 to 40 bits in 10,000. Therefore, whether you receive a million bits or a thousand, the ratio of flipped bits to total bits is the same. As long as the flipped bits in either direction (mean shifted up, PK+ or mean shifted down, PK-) consistently exceeds the 'noise' in the stream characterized by the wandering baseline (BL curve), the shift in the mean should be detectable.

D. The selection of a 20-minute period to achieve a significant statistical shift in the mean was not entirely arbitrary. PEAR test data suggests a 500- trial tripolar session (PK+, PK-, and undisturbed baseline) would take most operators less than one hour to complete (Jahn et al., 1987/2009, p. 99). Though difficult, this would imply that an average operator could shift the mean up or down within 20 minutes.

E. The human/machine interaction experiments carried out at the PEAR lab used ordinary volunteer subjects who claimed no special talent in this field. It may be possible to find people or couples, or groups that are particularly adept at introducing gremlins into a system and controlling them thereafter (Dunne et al., 2005, p.709).

F. To communicate in both directions, a similar setup is required at both ends. One may then ask if the operator at one end can influence that station's bit stream, can he/she influence the remote station's bit stream directly rather than going through an entangled quantum link? Data at the PEAR lab and others would seem to indicate this should be possible. But why stop there? Why not go to a direct mind-to-mind telepathic link? Could we, someday, bypass the whole messy business of communication equipment and have direct mind-to-mind thought transference? Perhaps. Would it be superluminal? I don't know. But a cursory internet search of the latest information on telepathic research would suggest that a scientific experiment involving "true" mind-to-mind thought transference, i.e., without the need for intervening sensory equipment, is a long way off. (Jennings, 2018; Iozzio, 2014).

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