

Faster-Than-Light Communication using Quantum Entanglement is Possible

Florentin Smarandache ^{1,*} 

¹University of New Mexico, Mathematics, Physics, and Natural Sciences Division 705 Gurley Ave., Gallup, NM 87301, USA.

* Correspondence: smarand@unm.edu

Abstract: In this little note we refute the statement that Faster-Than-Light Communication using Quantum Entanglement is Impossible, by proving that the alleged proof of the mainstream is irrelevant. Also, the Faster-Than-Light Communication does NOT mean sending information into the past. We recall the many paradoxes of the theory of relativity that make it unrealistic, while the Absolute Theory of Relativity [1] is the realistic one.

Keywords: Faster-Than-Light Communication; Quantum Entanglement; Absolute Theory of Relativity.

1. Introduction

Subluminal Physics (Classical and Relativistic): Deals with speeds less than the speed of light.

Superluminal Physics (Smarandache, 1972, 1982-1983 [1, 2]): This field proposes extending existing physical laws and formulas to speeds faster than light.

The superluminal velocity of some astronomical objects have been detected, but latter on they were considered as “optical illusions” since in the mainstream physics it is prohibited to think about superluminal speeds.

Instantaneous Physics: This is the theoretical extreme of superluminal physics, dealing with effects that are truly instantaneous (infinite speed).

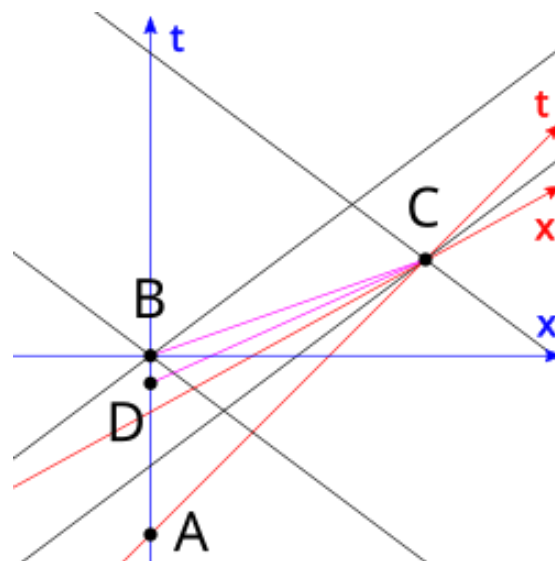
The concept of **instantaneous communication** is also prohibited in the mainstream physics, and sometimes called an **ansible** as in science fiction, pretending that it “would violate **causality** as described by Special Relativity”, as it could be used to send information into the past [3-7].

Entanglement is a quantum mechanical phenomenon where particles are so **deeply linked** that their individual quantum conditions are **inseparable**, regardless of their spatial separation. This effect is a **key differentiator** between the rules of quantum physics and those of classical physics.

Measurements of properties like momentum, spin, or polarization on entangled particles show a **perfect correlation**. A classic example is a zero-total-spin pair: if one particle is measured as “spin-up,” the other is instantly confirmed to be “spin-down” on the same axis. This instant correlation suggests a **paradoxical influence**: measuring one particle not only causes its wave function to **collapse** but also **instantaneously affects the quantum state** of its distant entangled partner.

Quantum Entanglement: Quantum mechanics is non-local, meaning entangled distant systems are correlated.

The **alleged proof of the non-faster-than-light communication** within the quantum entanglement [3-7] is presented in the diagram below and in the following explanation description:



"Spacetime diagram showing that moving faster than light implies time travel in the context of special relativity. A spaceship departs from Earth from A to C slower than light. At B, Earth emits a tachyon, particle that travels faster than light but forward in time in Earth's reference frame. It reaches the spaceship at C. The spaceship then sends another tachyon back to Earth from C to D. This tachyon also travels forward in time in the spaceship's reference frame. This effectively allows Earth to send a signal from B to D, back in time."

This logic is irrelevant, because:

If

from A to C the spaceship speed is slower than light (red color line),

while

from B to C the tachyon speed is faster than light (pink color line),

and

from C to D the tachyon speed is faster than light (pink color line),

it does not mean that sending signal

from B to D it is back in time!

And, by the way, how come "This effectively allows Earth to send a signal from B to D, back in time"?

It is a forced conclusion. Using fantastic theories, you get fantastic conclusions.

There are theories that became dogmas in science - and nobody has the right to dare challenging them...

"Faster-than-light communication other than possibly through wormholes is likely impossible because, in a Lorentz-invariant theory, it could be used to transmit information into the past."

"This would complicate causality, but no theoretical arguments conclusively preclude this possibility."

Faster-than-light communication does NOT mean that it is possible to transmit information into the past. Transmitting information into the past may only result by using unrealistic theories such as the theory of relativity or the Lorentz-invariant (the last one based on "relativistic" physics as well).

But these are just theories, which do not necessarily reflect reality. These theories generated many paradoxes, and the theory that generates paradoxes (Twin Paradox, the Barn-Ladder Paradox, the Ehrenfest's rotational disc paradox, Rotational Twin Paradox [8-9], Traveling Time Paradoxes [8-9]) is questionable, and is unrealistic.

Fantastic theories generate fantastic conclusions.

Some try to cram reality into their equations or theories, and if reality cannot be fit into these artificial theories, they *distort reality*!

That's why they reject the superluminal speed.

But, once freed from these dogmas and doctrines, the fields of Superluminal Physics and Instantaneous Physics (how the laws of physics, phenomena, formulas, equations, diagrams etc. behave at superluminal and respectively instantaneous speeds) will take off.

Declarations

Ethics Approval and Consent to Participate

The results/data/figures in this manuscript have not been published elsewhere, nor are they under consideration by another publisher. All the material is owned by the authors, and/or no permissions are required.

Consent for Publication

This article does not contain any studies with human participants or animals performed by any of the authors.

Availability of Data and Materials

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Competing Interests

The authors declare no competing interests in the research.

Funding

This research was not supported by any funding agency or institute.

References

1. Smarandache, F. (1982). Absolute theory of relativity & parameterized special theory of relativity & noninertial multirelativity. Somipress. Fés, Maroc. Retrieved from <https://fs.unm.edu/ParameterizedSTR.pdf>
2. Smarandache, F. (1983). New relativistic paradoxes and open questions. Somipress. Fés, Maroc. Retrieved from <https://fs.unm.edu/NewRelativisticParadoxes.pdf>
3. Perkwitz, S. (2011). Slow light: Invisibility, teleportation, and other mysteries of light. World Scientific Publishing Company. ISBN 978-1-84816-753-7.
4. Tipler, P. A., & Llewellyn, R. A. (2008). Modern physics (5th ed., p. 54). W. H. Freeman and Company. ISBN 978-0-7167-7550-8. "So existence of particles $v > c$, called tachyons, would present relativity with serious problems of infinite creation energies and causality paradoxes."
5. Penrose, R. (2004). The road to reality: A complete guide to the laws of the universe (p. 603). Jonathan Cape. ISBN 978-0-224-04447-9.
6. Siegel, E. (2023). No, we still can't use quantum entanglement to communicate faster than light. Starts With a Bang. Forbes. Retrieved January 6, 2023, from <https://www.forbes.com/sites/startswithabang/>
7. Griffiths, D. J., & Schroeter, D. F. (2018). Introduction to quantum mechanics (3rd ed.). Cambridge University Press. ISBN 978-1-107-18963-8.
8. Smarandache, F., Fu, Y., & Zhao, F. (2013). Unsolved problems in special and general relativity. Educational Publishing & Journal of Matter Regularity. Beijing, China. Retrieved from <https://fs.unm.edu/UnsolvedProblemsRelativity.pdf>
9. Smarandache, F., & Christianto, V. (2025). Beyond speed of light limit hypothesis and tunnelling time. Kusa Publisher Indonesia. Retrieved from <https://fs.unm.edu/Superluminal-book2.pdf>

Received: 31 Jul 2025, **Revised:** 31 Oct 2025,

Accepted: 17 Dec 2025, **Available online:** 19 Dec 2025.



© 2025 by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).

Disclaimer/Publisher's Note: The perspectives, opinions, and data shared in all publications are the sole responsibility of the individual authors and contributors, and do not necessarily reflect the views of Sciences Force or the editorial team. Sciences Force and the editorial team disclaim any liability for potential harm to individuals or property resulting from the ideas, methods, instructions, or products referenced in the content.