



[original insight]

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The limits of the light-speed limit

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Abstract

We present two limits of the light-speed limit.

keywords: quantum spacetime, light speed, warp drive

Introduction

1. The light speed also has limits.
2. It appears that the quantum nature of spacetime surpass the light-speed limit.
3. The theory of special relativity states that nothing can travel faster than light [1].
4. The light-speed limit of special relativity does not apply within the most fundamental quantum realm of spacetime.
5. There are at least two limits of (3), as we will see in the following sections.

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The limits

The expansion of the universe

6. The stretching of the universe is expanding faster than the speed of light in the sense that two objects A and B would appear to have relative speed $v > c$, where c is the speed of light.

The warp drive travel

7. *Warp* drive is a mean of *manipulating* the *stretching* of spacetime [2].
8. Due to (7), it can also transport objects from A to B with speed $v > c$.
9. In (8), what is really moving is the spacetime itself.
10. In other words, in the warp drive it's the building blocks of spacetime that are moving, not the objects themselves.

Final Remarks

11. The quantum building blocks of spacetime can move through spacetime faster than light by the quantum (digital) warp drive of spacetime.

Open Invitation

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Ethical conduct of research

This original work was pre-registered under the OSF Preprints [5], please cite it accordingly [6]. This will ensure that researches are conducted with integrity and intellectual honesty at all times and by all means.

References

- [1] Taylor, Edwin F., and John Archibald Wheeler. *Spacetime Physics*. Macmillan, 1992.
- [2] Alcubierre, Miguel. “The warp drive: hyper-fast travel within general relativity.” *Classical and Quantum Gravity* 11.5 (1994): L73. <https://arxiv.org/pdf/gr-qc/0009013.pdf>
- [3] Lobo, Matheus P. “Microarticles.” *OSF Preprints*, 28 Oct. 2019. <https://doi.org/10.31219/osf.io/ejrct>
- [4] Lobo, Matheus P. “Simple Guidelines for Authors: Open Journal of Mathematics and Physics.” *OSF Preprints*, 15 Nov. 2019. <https://doi.org/10.31219/osf.io/fk836>
- [5] COS. *Open Science Framework*. <https://osf.io>
- [6] Lobo, Matheus P. “The Limits of the Light-speed Limit.” *OSF Preprints*, 5 Feb. 2020. <https://doi.org/10.31219/osf.io/qgyhf>

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