



Remark on “Reversible dynamics with closed time-like curve and freedom of choice” by Germain Tobar & Fabio Costa

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Abstract

A new paper by Germain Tobar et al seem interesting, that they claim that reversible dynamics of CTC is possible. We comment this paper by pointing out at least 4 issues that make this paper problematic, not only practically but also conceptually.

Keywords: reversible dynamics; CTC metric

1. Introduction

A new paper is worthy of mention here "reversible dynamics with closed time like curve ..." At first glance it is quite interesting. Although issues like closed time-like curve (CTC), wormholes and warpdrive are normally considered as fringe research, from time to time new ideas are offered to resolve paradoxes and problems inherent.

Comments

However, on careful reading, there are at least 4 things that make this paper problematic:

a. Even though the title is reversible dynamics. But there is no experimental data whatsoever that shows a reversible process in this paper. Conclusion: indeed physics theory contains symmetry, but it doesn't automatically make it reversible. Just like chemical changes, physical changes are also irreversible.

b. Closed time like curve: usually refers to the solution of several known metrics, for example the Godel rotating metric. But the existing solutions have never been demonstrated empirically / experimentally. So CTC is only theoretical exercise. And it's usually called: fringe research.[2]

c. The combination of quantum theory and general relativity, or what is known as quantum gravity is problematic at both a conceptual and technical level. There is no satisfactory quantum theory of gravity in the last 4 decades.[3]

Allow us to cite our forthcoming paper, which attempts to model the solar system as low temperature physics [4]. This is what appears to be a realistic pathway to quantum gravity if there is such a thing.

d. Use of Minkowski metric, which combines space and time into *spacetime*, is also empirically not testable in real terms.

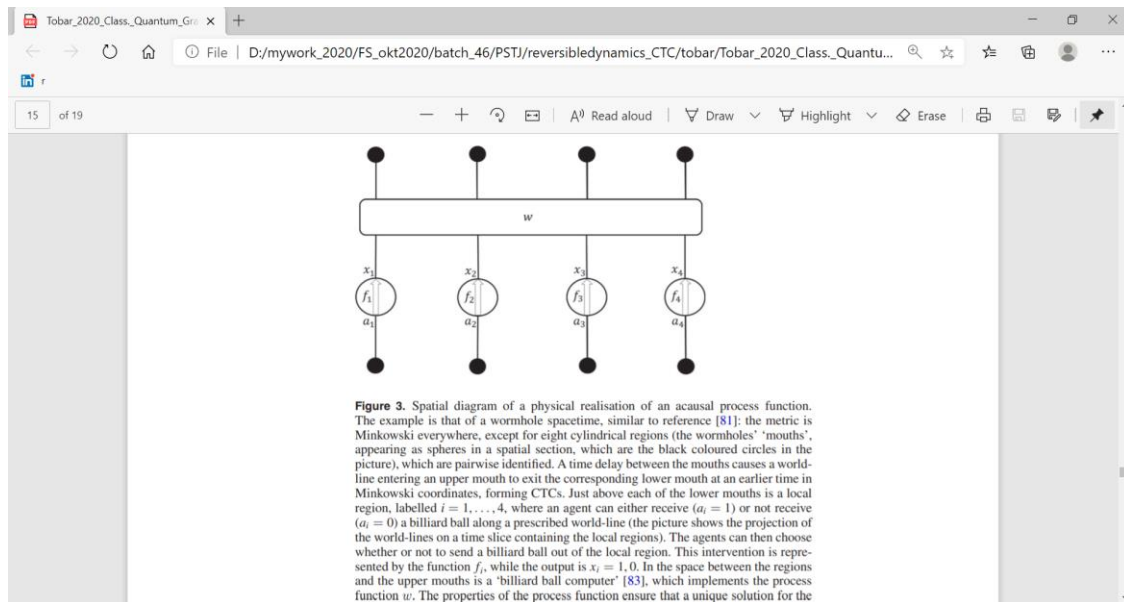


Figure 1: From Tobar & Costa [1]

In mathematical terms, we can write Minkowski lightcone in 2 dimensions:

$$ds^2 = dr^2 - c^2 \cdot dt^2 \tag{1}$$

Setting $ds = 0$, we obtained:

$$dr^2 = c^2 \cdot dt^2 \tag{2}$$

or

$$dr/dt = c \tag{3}$$

which means that the lightcone has speed of light as limiting velocity in the Universe. But research has shown that this is not true, as observations are abound suggesting that quantum-type interaction is possible.

In the past few decades, experiments have been carried out to prove the actual speed of interaction of Coulomb potential, according to suggestion by Rainer F. Huck [6-7]. And some results have shown that such a limiting speed of light may be not true. See figures below.

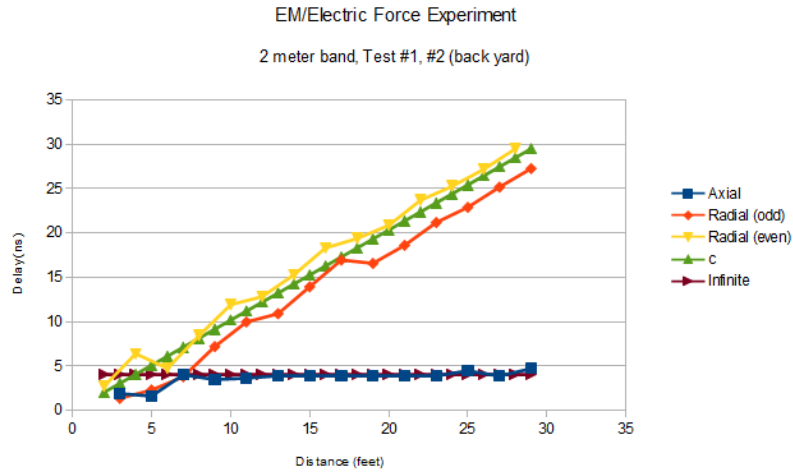


Figure 2: FTL-type communication

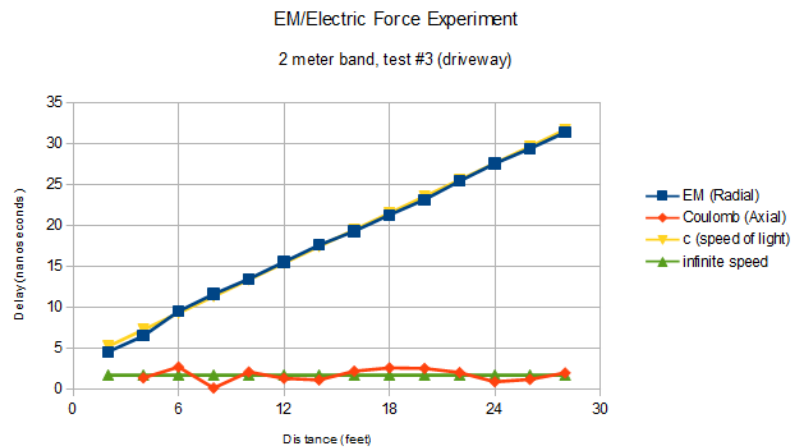


Figure 3: FTL-type communication

The above figures may also suggest that FTL-type communication is indeed possible.

To put it in concrete terms, try asking a watchman how to measure time, he/she will use a clock or stopwatch. Geodesist, he/she will use measurement and metering. But how do you measure the four dimensions of spacetime? It is actually an exaggerated process of theoretical idealism, meaning that it does not correspond to factual data. The correct one is 3 + 1 means 3d space and 1d time (Newtonian space). Observationally, it is found that the Universe corresponds with flat space metric.

Even so, there could be a complicated topology or differential geometry of 3d space; for example, 3d space but which involves matter-antimatter symmetry (symmetric 3D geometric space, see ref. [5]). This is perhaps can be called Dirac-Milne cosmology ... and we're beginning to researching on this topic.

Hopefully the comments above have been helpful.

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