Review of: "On Purported Physical Realizations of So-called Quantum Information Technologies"

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Potential competing interests: No potential competing interests to declare.

The manuscript's central claim is that it is impossible to measure the coordinate of a physical system with absolute precision. Oddly enough, the manuscript's flaw lies not in the claim itself, but in the author's attempt to validate it by challenging the mathematical frameworks of classical and quantum physics.

Meanwhile, a straightforward way to justify the claim would be the following.

A three-dimensional Euclidean space is a space defined over the field of real numbers. However, the real numbers contain an infinite amount of information. According to the holographic principle (namely, the Bekenstein-Hawking limit), a finite volume of space can't have more than a finite amount of information. This implies that the real numbers cannot be physically relevant. Stated differently, the coordinate of any physical object cannot be identified with the real numbers. Nicolas Gisin proposed to use only computable numbers since the information content of a computable number is the information that defines the algorithm to compute it, and such information is finite. It is quite clear that in a space defined over the field of finite information numbers, the manuscript's claim becomes trivially true.

Should the author wish to further pursue the research direction outlined in the manuscript, I highly suggest delving into Gisin's concept of real numbers.

These papers may give food for thought:

Gisin, N. Indeterminism in Physics, Classical Chaos and Bohmian Mechanics: Are Real Numbers Really Real?. Erkenntnis 86, 1469–1481 (2021). https://doi.org/10.1007/s10670-019-00165-8.

Gisin, N. Real numbers are the hidden variables of classical mechanics. Quantum Stud.: Math. Found. 7, 197–201 (2020). https://doi.org/10.1007/s40509-019-00211-8