Review of: "On Qubits and Quantum Information Technologies"

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Potential competing interests: No potential competing interests to declare.

In this work, the authors establish a comparison between the Euclidean space and Hilbert spaces. In this paper they explain that no quantum systems in the real world can realize qubits, and hence, quantum information technologies are not physically realizable; therefore, so-called advantages over classical information technologies make little sense to the authors. The authors say that, because the qubits derive from quantum superpositions, the same qubits fail to be real physical objects.

It's always interesting to read a work that tries to move against the current, in order to try to implement paradigm changes. However, the statements contained in the paper still raise some doubts.

First, a notable number of experiments have been implemented to verify the reality of quantum superposition states. From superconducting quantum interference devices ("SQUID") to beryllium ions, many other successful experiments involving superpositions of relatively large objects have been performed.

Secondly, the work is fundamentally based on the fact that quantum superposition systems are defined only in Hilbert mathematical spaces, but have no correspondence in the three-dimensional Euclidean space. However, all quantum mechanics is defined in Hilbert spaces and has no real correspondence in three-dimensional Euclidean space. One could, in this order of ideas, not consider as real a system of electrons that define the state of an atom, given that they are also defined as superpositions of states.

If we have correctly understood the ideas expressed in the article, it seems that it tends to be at odds with the fundamental ideas of quantum mechanics, which does not base its definitions on the behavior of quantum objects in three-dimensional Euclidean space.

Ultimately, the technical content of the article is not sufficient, especially in terms of comparison with real qubit applications. A comparative analysis has not been made regarding the current experiments of superposition states representing real physical systems.