

Peer Review

Review of: "On the Tangled Hierarchy of Wave Functions and Observers"

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The article gives a very interesting perspective on quantum states, as represented by wave functions, and their interpretations in terms of first-person experiences, more precisely, the consciousness of this person. It is crucial that different persons first can observe each other, and secondly can act as different first-persons. This is discussed in detail in Sections 2 and 3 of the paper. Consider, for simplicity, first only two persons, A and B. In the conclusion, it is said: 'There is a common cross-section world shared by both persons (and all others), which they interpret as an objective reality,' and further: 'Objective reality is the Hilbert space of all possible quantum states, associated with different possible states of consciousness perceiving the world.'

To me, it is unclear how this Hilbert space can be constructed without making a new, crucial assumption: There exists a universal 'first-person' which observes both A and B and the rest of us. In other words: There exists a God. In Pavsic's model, God has in his consciousness all knowledge of the world that can be perceived by any human being. In my own, related model of quantum mechanics, see [1], one can also argue that God is perfectly rational. These are, to me, very interesting conclusions that have many consequences.

Several authors have written about what they call a universal wave function. In the terminology of the previous paragraph, this must be seen as the wave function of God. Let $|A\rangle$ be that wave function. In the terminology of the present paper, this can be pictured as a branching tree. This gives a hierarchy of wave functions as illustrated in Figure 1 of the article. In principle, there are several possible branches available to God, but following the articles by Hervé Zwirn referred to, articles that claim to solve the 'measurement problem,' God's consciousness is forced to 'hang up' on one branch. This seems to a large extent to determine the fate of the world.

One can make many speculations from this point of view. In the discussion of Figure 1, Pavsic says, among other things, that the existence of many branches is a third person's view. But then the question is: Who can observe God?

I will here refrain from making further speculations. I agree very much with what is said in this paper, but personally, I try to avoid the many worlds' interpretation simply by referring to Occam's razor. I am also a little skeptical towards an unlimited use of the superposition principle, but that is another story.

In all, I regard this article as giving deep and informative discussions, stimulating many thoughts.

Reference.

[1] Helland, I.S. (2023). Quantum mechanics as a theory that is consistent with the existence of God. Dialogo Conference Journal 10 (1), 127-134.

Declarations

Potential competing interests: No potential competing interests to declare.