

# Review of: "What connects entangled photons?"

Mojtaba Mazaheri<sup>1</sup>

<sup>1</sup> Hamedan University of Technology

**Potential competing interests:** No potential competing interests to declare.

June 11, 2023

Prof. Gabriele Marinello

Peer Review Team, Qeios

Dear Prof. Gabriele Marinello,

Enclosed please find my comments to the manuscript <https://doi.org/10.32388/KOWJPP> entitled "What connects entangled photons?" in the following part. I would like to thank you for inviting me to review this manuscript submitted to *Qeios* journal.

With kind regards,

Mojtaba Mazaheri

Assistant Professor

Department of Basic Science

Hamedan University of Technology

Fax: +98 8138380520

Office: +98 813 8411566

Email: [mojtaba.mazaheri@hut.ac.ir](mailto:mojtaba.mazaheri@hut.ac.ir)

## COMMENTS FOR THE AUTHOR:

Dear Author,

The paper entitles as "What connects entangled photons?" has discussed how entangled photons are linked to each other? This paper proposes a model that is realistic and local, meaning that it does not involve any nonlocal action or hidden variables. The paper presents a local realistic model that refutes Bell's theorem and explains entanglement swapping and teleportation in terms of initial conditions and conservation of spin angular momentum. The paper claims that the model is consistent with quantum mechanics and reproduces the quantum mechanical predictions for expectation

values with polarization measurements. The paper also claims that the model does not violate causality or relativity and does not require faster-than-light communication or nonlocal action. The topic of this article is very important and controversial in fundamental physics. The paper is well-written and clear, but it has some limitations and weaknesses that need to be addressed. For example:

- The paper does not provide any experimental evidence or testable predictions to support the validity of the model. It only shows that the model can reproduce some known results of quantum mechanics, but it does not explain how the model can account for other quantum phenomena, such as interference, superposition, uncertainty, etc. Considering the difficulty of preparing experimental results, it is suggested to provide more explanation in this case.
- The paper does not address the issue of contextuality, which is a key feature of quantum mechanics and a source of nonlocality. The paper assumes that the measurement outcomes are independent of the choice of measurement settings, but this assumption is contradicted by various experiments, such as Kochen-Specker [11] and Hardy [12]. Please clarify.
- The paper does not consider the possibility of entanglement between more than two particles, which is a common scenario in quantum information and computation. The paper only deals with two-particle entangled states, but it does not explain how the model can be generalized to multipartite entangled states, such as GHZ [13] and W [14] states. Please clarify.
- The paper does not address the issue of realism, which is a key assumption of the model. The paper assumes that the physical properties of the particles are well-defined and independent of observation, but this assumption is challenged by various experiments, such as Leggett-Garg [15] and Bell-CHSH [16]. Please clarify.
- The paper should improve the clarity and readability of the text by avoiding long sentences, using proper punctuation, grammar, and spelling, and following a consistent style and format throughout the paper.