

Review of: "Erratum: Comment on "On a contextual model refuting Bell's theorem" by Muchowski Eugen"

Eugen Muchowski

Potential competing interests: No potential competing interests to declare.

Comment on Erratum by J.P. Lambare

Eugen Muchowski^{1,(a)}

¹ *Eugen Muchowski, Independent researcher, Vaterstetten, Germany*^(b)

(a) *E-mail: eugen@muchowski.de*

(b) *Present address: Primelstraße 10, 85591 Vaterstetten*

Abstract

J. P. Lambare claims that in a modification of the paper "On a contextual model refuting Bell's theorem" the modified model evaluates expectation values with different hidden variables in the same term. This claim is unfounded. At no point in the paper have been different values of the hidden variable assigned to the same entangled photon pair.

Introduction

The paper ^[1] was subject to a comment ^[2]. There exist an Erratum ^[3] for the original paper ^[1] and an Erratum ^[4] for the comment ^[2]. In this Erratum ^[4] it is claimed without proof that "the modified model evaluates $E(\alpha, \beta)$ with different hidden variables in the same term". This claim is unfounded. Model assumption MA2 ^[1] which states "Photons of an entangled pair share the same value of the parameter λ " is still part of the modified model. At no point in the paper ^[1] or in the Erratum ^[3] have been different values of λ assigned to the same entangled photon pair.

Arguments

Erratum ^[4] cites Erratum ^[3]: "In the paper ^[1] it was assumed that matching photons selected by the polarizer PB have to have the same value range of λ as matching photons selected by PA. This is, however, not a necessary assumption as the photon pairs selected by PA are different from photon pairs selected by PB as they have a different polarization." This passage does not at all allow to conclude "That the new modified model considers results of particles from different entangled pairs is made explicit by the author". This would suggest that the two particles of the same entangled pair have different values of λ . J. P. Lambare means this explicitly when he writes "the modified model evaluates $E(\alpha, \beta)$ with different hidden variables in the same term"

A selection by PA comprises all photons₁ hitting PA at α and their peer photons₂ as well with the same λ as photon₁ and polarization $\alpha + \pi/2$. Those peer photons₂ hit PB at β with probability to be calculated by equations ^[1](4,4a). A selection by PB, on the other hand, includes all photons₂ which hit PB at β and their peer photons₁ as well with the same λ as photon₂ and polarization $\beta - \pi/2$. Those peer photons₁ hit PA at α with the same probability as above calculated by equations ^[1](4a,4). In either case no different values of λ exist in the same term which can be seen by looking at equations ^[1](4,4a). Photon pairs selected by PA can however have a different value range of λ than a selection by PB. As both selections do not exist simultaneously this is not a contradiction.

Conclusions

The Erratum ^[4] acknowledges the invalidation of the section "The model nonlocality" in the comment ^[2]. The claim made in Erratum ^[4] that "the modified model evaluates $E(\alpha, \beta)$ with different hidden variables in the same term" is unfounded. Thus, the model ^[1] remains valid along with the changes made by Erratum ^[3]. The Reply ^[5] with the rebuttal of the comment ^[2] is not affected and remains valid in every aspect.

References

1. ^{a, b, c, d, e, f, g, h, i} Muchowski E., *On a contextual model refuting Bell's theorem*, EPL 2021 134 (10004)
2. ^{a, b, c, d} Lambare J. P., *Comment on "On a contextual model refuting Bell's theorem" by Muchowski Eugen*, EPL 2021 134 (50001)
3. ^{a, b, c, d} Muchowski E., *Erratum: On a contextual model refuting Bell's theorem*, EPL 2021 135 (69901)
4. ^{a, b, c, d, e} Lambare J. P., *Erratum: Comment on "On a contextual model refuting Bell's theorem"*, EPL 2021 ...(...) <https://doi.org/10.1209/0295-5075/ac4622>
5. [^] Muchowski E., *Reply to a Comment by Justo Pastor Lambare*, EPL 2021 134 (50002)