

Reply to the referee report on [1]

First of all I am grateful to the referee for the grammatical error found, and for solidarity with me about rejection practice of the *Phys. Rev.* editorial board.

Replies to some comments made by the referee.

1. The referee writes: “We had to wait 72 years for Ignatovich to realize that Einstein et al. merely misunderstood the uncertainty principle!”

My reply: it seems that 72 years is not sufficient period for physical community to realize that uncertainty relation $\Delta x \Delta p \geq \hbar/2$ is valid for any function $f(x)$ and has nothing specific to quantum mechanics. It is a well known mathematical theorem, which relates ranges of the function in coordinate and Fourier spaces. As for position of particle, it is a matter of definition, because position of an extended object described by a function $f(x)$ can be only a matter of definition. Therefore a particle can have exactly defined position and momentum simultaneously independently on commutativity or noncommutativity of their operators. It is discussed in details in ref. [13]. The referee did not show what is wrong, therefore I have nothing to add.

2. The referee asks about EPR error: “What, then, was that fundamental error?”

My reply: it is clearly pointed out in Eq. ([1]6). Correction of this error shows that momentum operator has no eigen function appropriate for description of physical particles. Therefore the EPR declaration that the momentum is a real quantity only, if it is an eigen value of the momentum operator, is also erroneous. The referee did not show what reasoning in the chain of the proof of the EPR error is obscure, and he did not point out what did he not understand in my conclusion. Therefore I am unable to defend myself on this point.

3. The referee writes that my analysis of experiments “is so convoluted and obscure that” he “failed, time and again, to comprehend it.”

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My reply: he did not prove that the analysis was wrong. He did not show where it is “convoluted and obscure”, so I have no chance to elucidate my analysis.

4. The referee writes that according to the EPR-Bell reasoning the results of measurements of spin projections of two particles is not independent, and can be explained only if “each particle ”knew” which measurement was carried out on the other particle, and what the result was”. He insists that this “prediction is simple, **hence its refutation should be just as simple** without getting into technicalities”.

My reply: I can formulate my claim in similar terms: **the results of measurements of spin projections of two particles is not independent, but they can be explained without knowledge by each particle which measurement was carried out on the other particle, and what the result was.** However without technicalities both claims are only symbols of faith, and not the physics. So I had to show that no so far performed experiment presented a proof of action at a distance. The referee did not point out where I am wrong, so I have no reason to accept his symbol of faith.

5. The referee writes that I fail to even mention the nonlocality proof, known as GHZ.

My reply: Yes I did not mention it because it takes into consideration number of particles larger than two. If importance of GHZ paper for referee means that action at a distance exists only for three and more particles, then he should approve the paper [1], and in the next paper we can analyze together the GHZ article and related experiments.

6. The referee writes that I seem “ to believe that the role of the referee is not to offer scientific comments on a paper but write a report that will be **interesting** (to the author, of course)”.

My reply: I consider report interesting when it contains **scientific comments**, and not only abuse of the author by such words as convoluted, obscure, abundant technicalities, counter-revolution, self-assured manner and so on.

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7. The referee writes that I fail “to address even a single scientific objection pointed out by the conscientious ZhETF referee.”

My reply: I addressed every one objection of this referee. I changed the paper, added analysis of experiments on down-conversion and replied all his objections. So, the words that I fail “to address even a single scientific objection” are wrong.

8. The referee writes that my paper is “unsuitable for publication because it is utterly misleading,” because it “dismisses revolutionary features of quantum mechanics”, and because my “self-assured dismissals” are “not backed by any reasonable argument other than obscure mathematics and odd notation.”

My reply: I wonder which argument is unreasonable? The referee did not point a single one. I wonder what does it mean “obscure mathematics”? The mathematics can be wrong or correct, and the referee considered no equation. I wonder what notation is odd? There is no hint in the referee report. So I don't know how to improve the paper.

I hope the readers will see that my replies to all the referees demonstrate my “willingness to have a genuine dialogue”, but up to now I found no referee with adequate approach to the paper.

Acknowledgement

I appreciate so much publication in Concepts. It is a single Journal in the world, which gives a hope to authors to start a real dialog with reasonable physicists.

Vladimir K. Ignatovich

References

- [1] V.K.Ignatovich, ”On EPR Paradox, Bell’s Inequalities and Experiments that Prove Nothing”, Concepts of Physics **V** (2008) p. 227.