Review of: "Consistent Interpretation of Quantum and Classical Mechanics"

Sergio Caprara[1]

1 INFN - Istituto Nazionale di Fisica Nucleare

Potential competing interests: No potential competing interests to declare.

I have carefully read the various versions of the manuscript "Consistent interpretation of quantum and classical mechanics", by Andrew Das Arulsamy, and I am afraid I agree with most of the criticism that has been raised against it by other reviewers.

First of all, I find that several rather different issues are put together, resulting in complete mayhem. For instance, the problem of defining a wave function in the relativistic realm is well known, the well-defined concept in this case being the quantum field. Within this context, the wave function emerges as an approximate concept in the non-relativistic limit. Photons, however, are always ultra-relativistic, so I found the discussion about photons rather misleading.

Also the problem of measuring the position of an electron, for which the non-relativistic limit can be defined, is discussed in a very confusing way. The author discusses at length the problem of measuring a radius (which is not a position), without really touching the problem of determining the position of the electron. And even if the question was about how to measure the radius of an electron belonging to an atom, the author does not really describe a procedure to carry out this measurement, nor the reason why one should be interested in measuring radiuses rather than positions in the first place.

Furthermore, although I am personally not fond of notational issues, I must add that the notation adopted for Δ is not only confusing, but, more importantly, incoherent. Following the author's line of reasoning, one should compare the radius r (not in boldface) with $\Delta\mathbf{r}$, but r has dimensions of a length, while Δr is associated with πr^2 which is seemingly an area, so the two quantities cannot be compared.

Finally, it seems that the author considers only very special possible states for an electron, so it is absolutely unclear how the theory would be generalized to cases in which the wave function is NOT of the form assumed in Eq. (9), like for instance the textbook example of an electron in a uniform magnetic field, nor what happens if observables that have a classical counterpart are entangled with genuinely quantum observables. Here, the author seems to discard relevant cases, like the presence of spin-orbit interactions, or chiral states.

In conclusion, I cannot recommend publication of this manuscript.