



SDI FINAL EVALUATION FORM 1.1

PART 1:

Journal Name:	Physical Science International Journal
Manuscript Number:	Ms_PSIJ_37038
Title of the Manuscript:	Generalized Uncertainty Relations in Quantum Mechanics and the Principles of Completeness in Physics
Type of Article:	Original Research Article

PART 2:

FINAL EVALUATOR'S comments on revised paper (if any)	Authors' response to final evaluator's comments
The paper contains serious drawbacks that put it in a very unfavorable form. I think that the Author should warn readers of these drawbacks so that they can understand the actual status of his paper. For these reason, the Author should revise his paper so that it contains the following points: 1. A statement like the following should be put in the Abstract: The main idea of this paper is still incomplete and several fundamental problems should be resolved before it can be accepted. 2. A statement like the following should be put in the Introduction: The Conclusion section mentions problematic points of the main idea of this work. 3. The Conclusion section should contain at least the following material. The idea presented in this work is still in an incomplete form. The primary issue is that the ordinary form of quantum mechanics explains many experimental data which are yet unexplained by the idea of this work. Here are several specific points that should be resolved before the paper's idea can be accepted: A. It must be shown how eq. (12) is extended to a relativistic form. B. A description of states of the hydrogen and the helium atoms (see also item E below). C. The ordinary form of quantum mechanics uses linear equations. These equations have eigenvalues and eigenvectors that represent properties of quantum states. It is not clear how the nonlinear equation (12) can describe quantum states (see the next item). D. The primary equations of ordinary quantum mechanics are linear. This property enables the construction of a Hilbert space [1]. The nonlinear structure of eq. (12) is inconsistent with the Hilbert space of ordinary quantum mechanics. E. A relevant paper: ELEMENTARY NONLINEAR MECHANICS OF LOCALIZED FIELDS discusses the hydrogen atom and says: "we obtain as solution the standard hydrogen atom quantized solutions". Now the Author's equation (12) is different from the Schrodinger equation. Hence, it is not clear how two different equations yield precisely the same solutions. Furthermore, if the Author really obtains the ordinary schrodinger solutions then the following problem arises: A radially excited solution has at least one zero point (see [2], p. 85). Near this point the quantity $(\theta\theta^*)^{1/2}$ of his (12) takes the shape of the letter V. Hence, the first derivative of $(\theta\theta^*)^{1/2}$ is discontinuous and the second derivative is undefined. For this reason it is not clear what is the result of the Laplacian of this quantity. On top of that, the denominator contributes a factor of the order of ∞ to this undetermined Laplacian result. F. The Author may add other points to this list. References: [1] https://en.wikipedia.org/wiki/Eigenvalues_and_eigenvectors [2] L. I. Schiff, <i>Quantum Mechanics</i> (McGraw-Hill, New York, 1955).	We agree with the evaluator that the present ideas are still to be developed further. We will therefore comply with the evaluator's suggestions, although giving them a more candid form, which by no means redraws any substance to the proposed revisions. 1. We will write the following in the abstract: The ideas presented in this paper are initial standpoints of what can hopefully be expected to be a more mature and unifying physical theory, still undergoing development. 2. We will write the following in the Introduction: It should be mentioned that some theoretical, mainly formal issues are still to be clarified, concerning the adequacy of the present theory to quantum phenomena. These do not seem to be fundamental drawbacks but mainly technical difficulties, only requiring more sophisticated use of wavelet analysis or research on the applicability conditions of our proposals. We will say more about this in the Conclusion. 3. We will write the following in the Conclusion section: It should again be noticed that the proposed pilot-wave theory using wavelet analysis, must still be worked on a set of cases already described by standard quantum mechanics formalism. These for instants comply relativistic treatment of the Master equation (12) and eventually a more detailed description of the states of the hydrogen and helium [6]. Another key point to be dealt with concerns the formal relation between the present theory and orthodox quantum mechanics formalism. It should be emphasized that although both theories uses undulatory formalisms, orthodox quantum mechanics describes Nature referring to a pure conceptual configuration space. This, of course, comes from Bohr's choice of an idealistic ontology for the nature of atomic entities. From a formal point of view, the Hilbert space can be defined using the linear properties of Schrödinger's differential equation, that is, the fact that linear compositions of solutions are still solutions of that same equation. As, in general, such property will not hold for the Master equation (12), it can be argued that one will obtain Schrödinger's differential equation whenever the non linear term in the Master equation is null. This will depend on the steepness of the waveform intensity and, one should add, probably on a very large sigma value, for which the wavelet's spreading becomes also very large. Our own approach comes closer to prior ones by Vigier and de Broglie, in which the nonlinear term in the basic equation becomes of great importance only in a very small region occupied by the particle being described. A small distance away from the particle, and in the usual conditions such as in the atomic structure, the nonlinear term becomes negligible, and the linear description is recovered. One should finally add that the proposal of some nonlinear extension of quantum mechanics is not new, by any means. Several authors in the past, such as de Broglie, Vigier, Smolin, Weinberg, and others have attempted comparable modifications, such that the usual linear quantum mechanics formalism, and the supporting Hilbert space framework, are recovered in most situations. We hope that our efforts will contribute, in the near future, to a more general physical theory, offering a wider and richer mathematical formalism.