SDI FINAL EVALUATION FORM 1.1

PART 1:

Journal Name:	Physical Science International Journal
Manuscript Number:	**2014_PSIJ_11144**
Title of the Manuscript:	**Computational Solution to Quantum Foundational Problems**

PART 2:

FINAL EVALUATOR'S comments on revised paper (if any)	Authors' response to final evaluator's comments
The author made substantial changes to the paper. My main concern (the notion of "solution") remains the same. I repeat that obtaining an "exact" solution of any quantum problem is basically hopeless in general. The first eigenvalue (=ground state) of the Hamiltonian takes value in an uncountable set, while any language contains only a countable set of sentences (=finite sequences with value in a finite alphabet).	1. The reviewer's remark that the "… first eigenvalue (=ground state) of the Hamiltonian takes value in an uncountable set" cannot be regarded as correct. For example, let us consider the following problem (known to be NP-complete): Can one divide a set of assets with values $n_1, \dots, n_N$, fairly between two people? This problem can be written down as an Ising model of a spin glass, i.e., as a model that describe the energy $H(\sigma_1, \dots, \sigma_N)$ of configuration of a set of N spins $\sigma_j \hbar \in \{-\hbar, +\hbar\}$: $$H(\sigma_1, \dots, \sigma_N) = A\left(\sum_{j=1}^{N} n_j \sigma_j\right)^2,$$ where $A > 0$ is some positive constant. As usual, in the quantum version of this Hamiltonian, the spins σ_j are replaced by a quantum operator $\hat{\sigma}_j$ (Pauli spin-1/2 matrices at spin 1/2) $$\sigma_j \to \hat{\sigma}_j = \begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix},$$ thus the quantum Ising Hamiltonian $H(\hat{\sigma}_1, \dots, \hat{\sigma}_N)$ acts on the spin $\sigma_j = \pm 1$ in the Hilbert space of N spins whose dimension is 2^N. It is clear that if there is an exact solution to the Ising model with $H(\sigma_1, \dots, \sigma_N) = 0$, then there is a configuration of spins where the sum of the n_j for the +1 spins is the same for the sum of the n_j for the −1 spins. Thus, if the ground state energy is $H(\sigma_1, \dots, \sigma_N) = 0$, there is an exact solution to the number partitioning problem (and if $H(\sigma_1, \dots, \sigma_N) > 0$ we will know that there are no solutions to the partitioning problem). As follows, the ground state energy of N interacting spins does not take values in an uncountable set. Quite the opposite, to find the ground state $H(\sigma_1, \dots, \sigma_N) = 0$ of this model (that is, to find a configuration of the spins with the total zero energy) using a brute force algorithm will require a search over finite 2^N combinations.
In short: it is not possible to describe all the real numbers. Since the point spectrum of the Hamiltonian is arbitrary, I think that the author should only address the numerical approximation of the eigenvalues of the Hamiltonian. **The point of the paper is: the time needed for numerical investigations growths exponentially with the dimension of the system. I agree with this well-known fact.**	2. The point of the paper: Quantum theory (particularly its fundamental Schrödinger's equation) is, in all likelihood, *computationally hard*, i.e. infeasible. Therewithal, the question as to what means being "computational" or "computable" is not considered in the paper. Certainly, it is true that ordinary computers can compute only a tiny subset of all functions. Is it physically possible to do better? Which functions are physically computable? These questions (though very interesting) are beyond the goals of the paper.

SDI FINAL EVALUATION FORM 1.1

The paper is mathematically empty and (hence) correct. I am not competent to assess the physical interest of the subsequent conclusions.	Thank you again for your valuable time and consideration.