Review of: "Emergent Quantum Mechanics – How the Classical Laws Can Replicate the Quantum Harmonic Oscillator"

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Potential competing interests: No potential competing interests to declare.

The paper is framed in the context of Emergent Quantum Mechanics which aims to show that quantum mechanical results can be recovered by exploiting and combining classical laws, so regaining causality and determinism. The paper is based on the fact that droplet systems can display nonlocal interactions which recall the particle-wave duality, a fundamental phenomenon of quantum systems. Then, first the author describes and discusses a droplet model of electrons combined with Maxwell's laws, and subsequently shows that this model can reproduce the behavior of the quantum harmonic oscillator.

Attempts to find deterministic models which reproduce quantum mechanical laws (see e. g. some papers of Gerard 't Hooft and of other authors) are interesting for their conceptual valence, although obviously they cannot compete with the standard quantum mechanical approach in terms of simplicity and effectiveness. On the other hand, sometimes roads that deviate from the main street can open up new horizons.

The paper is therefore interesting, and if one looks to the scientific content it deserves to be published. However, particularly in the first part devoted to the describe the general model, the work appears rather tiring to read. I suggest for example that the author groups into a single section, then divided into subsections, all the first part that is devoted to the general model. Moreover, I suggest to show first in this section the results, and then, separately, the discussion on the conditions which lead to these results. In presenting the results on the droplet model, even without reporting all the treatment already present, as said by the author, in another publication, a rough sketch could be presented that offers some more details.

Some further very litlle remarks: I agree with another referee that the statement "Einstein/Newton dynamics" seems somewhat odd, unless it is explained an its possible meaning, and that the term "instationary" must be replaced by "non-stationary".

In conclusion, the paper may be recommended for publication if the author will make it easier to read as discussed above.