Review of: "The Compton Wavelength Is the True Matter Wavelength, Linked to the Photon Wavelength, While the de Broglie Wavelength Is Simply a Mathematical Derivative"

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Potential competing interests: No potential competing interests to declare.

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This paper aims to point out some deep contradictions that might have led the standard model toward the dead end where gravitation cannot be described. As mentioned in the title, the contradiction under investigation is the de Broglie wave and its interpretation within the framework of quantum mechanics.

The idea that the de Broglie wave would not be physical could well be revisited one more time. Nevertheless, some severe drawbacks within the content and the form of this paper avoid this attempt to be convincing.

First, the absence of a physical unit in equations 38, 39, and 40 is barely comprehensible. Even if a unity of measure is used, it cannot cancel out the physical meaning of entities. Except when a deep symmetry reason is demonstrated that would change the nature of measurements, the dimensional equation cannot be modified in the physical world. For example, the ratio of frequencies (38) cannot give kg.

Second, doubting in science is a quality. Questioning the equations found by pioneers in physics is necessary. What is at fault, however, is to underestimate their thoughts and their understandings. This is unfortunately the case in this paper; for example, on p.2 “We think the reason it has not been discovered before is that the research community has primarily associated mass with the de Broglie wavelength rather than the Compton wavelength,” or on p.5 “No one asked if de Broglie could simply be right on his first point that matter had wavelike properties, but that the matter wavelength could actually be the Compton wavelength.”

Let us come now to the main problem. The author is precisely discussing what divides the physical community since the early 20th century until today: what interpretation can be given to quantum wave mechanics. The two main schools are the orthodox vision (Bohr and Copenhagen school) in favor of a probabilistic wave interpretation and the early vision (de Broglie, Bohm…) in favor of a pilot wave approach. And there is no “Compton-like school.” Why? Contrary to what the author thinks, de Broglie's enlightenment is not only having had the vision of a matter wave. Above all, he had the fantastic and powerful intuition (what Einstein mentioned to be a worthy discovery) that there was a resonance with the orbit of the electron. Schrödinger built his equation with this principle in mind, and the beauty is that it could perfectly

explain the orbital distances of electrons in the hydrogen atom. So if the author wishes to question this de Broglie wave matter, then he must show on which hypothetic structure the Compton wave would resonate. And there is no serious answer to this question today.

Until this point is resolved, the best theory remains that of the matter wave, whether it is a probabilistic wave or a pilot wave, since it perfectly matches the distance between the orbits of Hydrogen.