# 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.

**A. Comments on the Paper's Novelty:**

This paper delves into a subject that challenges established theories, and its novelty warrants its publication. Even though the academic world may not have fully grasped its contents, such papers are rare in current publications. [1]

Author Espen Gaarder Haug from Norwegian University of Life Sciences, as well as I with a background in inorganic chemistry, might be considered a layman in the field of physics, given the paper's topic. However, this should not detract from the depth of the research. History has repeatedly demonstrated that groundbreaking discoveries often emerge from minority perspectives, facing resistance from mainstream scientists of their time. For instance, recent publications in reputable journals have effectively debunked the prevailing theoretical framework for microwave absorption materials, relying on well-established principles of physics accessible at a college level and mathematical skills no more advanced than those of junior middle school. These issues hold fundamental significance and should pique the interest of material scientists. The papers presenting these innovative ideas have garnered considerable attention, as reflected in the numerous views and downloads they have received. This suggests that a substantial portion of authors and reviewers in the field have been exposed to these novel perspectives. Nonetheless, there is a concerning trend where incorrect theories persist in numerous publications without adequate counterarguments alongside the already available opposing views. [2] Authors who deliberately sidestep addressing opposing views to secure publication engage in dishonest practices. Moreover, reviewers encouraging to publish incorrect papers to dilute their own previously erroneous work represents a more severe form of dishonesty.

Christian Brand of the German Aerospace Center (DLR), Köln, Germany, noted, " This is on the one hand connected to strongly overselling of points, which are common knowledge. Furthermore, there is an excessive number of self-citations and partial misinterpretations of physical concepts. " (https://www.qeios.com/read/Q6CTB4) I concur with Mr. Christian Brand that there are indeed numerous self-citations in this paper. However, this also implies that the author has invested significant effort in the subject, indicating the seriousness of the research. The scientific community should offer authors the freedom and comfort to cite their own work, especially when only a few have engaged in such research. After all, commercial promotions for articles are permitted in the academic world, so why not allow authors to advocate for themselves? [1,2]

Eric Bittner of the University of Houston, United States, challenged the author, stating, " I'll offer the author a challenge to send this manuscript to an actual peer reviewed journal, say Phys Rev A. My bet is that my comments will be very kind in comparison to any referee report that is returned--provided that the editor actual decides to send the manuscript out for review--I'd give it a 10% chance that PRA would even send this out. In fact, I'll even give the author fighting chance by sending it to a journal I edit (Philosophical Magazine) that may be open to this work. For historical context, de Broglie's paper was published in PM." (https://www.qeios.com/read/DZ8PJZ) I agree with Mr. Bittner that manuscripts challenging established theories often encounter significant resistance to publication. Nevertheless, the scientific community would benefit if new journals like Qeios and traditional ones like Phys Rev A were treated equally. If commercial promotions and the distinctions between journal tiers were eliminated, numerous subpar papers would naturally disappear, allowing truly excellent papers to stand out on their own. [1,2]

**B. Comments on the Paper's Arguments:**

Could you please define "j" in Eq. 10?

In classical physics, the speed of a particle and the speed of wave propagation are well-defined. Momentum and energy for a particle are also clearly defined.

It is a well-established fact in physics that photons are massless particles. The speed of a photon is identical to the speed of light. Therefore, Eq. 1 in the paper is not applicable to photons unless mass can be defined for a photon. In the context of the Compton effect, energy and momentum are defined as:

$$E = h * frequency$$

$$p = h/wavelength$$

where mass is irrelevant.

However, in the context of the wave-particle duality of particles:

$$E = V(r) + mvv/2$$

$$p = mv = h/wavelength$$

The speed of an electron is not the same as the speed of its wave propagation.

The novelty of this paper lies in extending the conclusions from the Compton effect for photons to apply to particles with rest mass "m." This extension challenges established physics concepts. The extension involves defining the momentum of a particle with mass "m" as "mc," where "c" represents the speed of light in a vacuum. The speed of wave propagation of particles is a theoretical proposal verified by quantum mechanics but has not been addressed in the paper. If the speed

of wave propagation of particles in the new theory is also defined as the speed of light, then the new theory, incorporating the Compton wavelength for particles, holds the advantage of having the same speed for particles and their wave propagation. The wavelength defined in the new theory differs from that of the de Broglie wavelength, whether the speed of wave propagation of particles is "c" or not.

To validate the arguments presented in the paper, the following discrepancies should be addressed:

It is common knowledge in classic physics that the speed of a moving particle is much lower than the speed of light.

When classical particles with a fixed speed pass through a small hole, the resulting diffraction patterns align with classical wave mechanics based on the de Broglie wavelength, rather than being predicted by the Compton wavelength.

Established quantum mechanics is founded on the de Broglie wavelength. The new theory should aim to provide a consistent system as an alternative to quantum mechanics based on the Compton wavelength. Furthermore, it would be even more beneficial if the new theory could introduce new features not covered by quantum mechanics. Additionally, it would still be valuable if the new theory only added new features to quantum mechanics, instead of completely replacing it.

I have observed that the author highlights several features of the new theory in the paper:

For instance, Eq. 9 is elegantly presented.

The Rydberg constant can be expressed alternatively using the Compton wavelength.

The Planck constant has been incorporated into expressions involving the Compton wavelength.

It is shown from the paper that certain treatments in quantum mechanics can potentially be supplanted by the new theory.

**C. Comments concerning decision for publication:**

Even if the new theory proposed in the paper is eventually proven in history to have failed in achieving its intended goals, the work still merits publication.

Failed results from experiments within the mainstream theory are accepted for publication. Hence, a theory challenging established principles, even if it may not succeed in subsequent investigations, should still be considered eligible for publication. Even if the new theory is ultimately demonstrated to be unsuccessful, it retains value in demonstrating that this particular approach or line of thinking does not yield the desired results.

**Reference:**

[1] Ethical problems in academic peer review

https://www.peeref.com/hubs/218

http://arxiv.org/abs/2310.05966

https://www.peeref.com/roulette-hubs/1044

https://www.peeref.com/roulette-hubs/1037

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https://www.peeref.com/roulette-hubs/1046

https://www.peeref.com/roulette-hubs/1020

[2] Accepted theoretical framework in the current research field of microwave absorption material has been debunked.

https://www.growkudos.com/profile/yue_liu_2

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