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"

Margaret Hawton[1]

1 Lakehead University

Potential competing interests: No potential competing interests to declare.

QeiosReviewHaug

The authors "demonstrate that the Compton wavelength corresponds exactly to the photon wavelength of rest mass energy".

From Wikipedia: Compton wavelength: "The Compton wavelength is defined as the wavelength of a photon, the energy of which is the same as the rest energy of
that particle," and from de Broglie wavelength: "de Broglie's
momentum-wavelength relation generalizes the Planck relation to matter waves. De Broglie argued that if particles have a wave nature, the relation $E=h\nu$ would also apply to them, and he postulated that particles would have a wavelength equal to $\lambda=h/p$."

The fundamental relativistic equation relating energy, momentum, and mass is $E^{2}-p^{2}c^{2}=m^{2}c^{4}$. For a photon, $m=0$, $E=hf$, $p=h\lambda$, and $\lambda f=c$, where f is the frequency. The Compton hypothesis is $hf=\gamma mc^{2}$, so $\lambda_{c}=h/\gamma mc$. For deBroglie matter waves, $E=\gamma mc$, $p=\gamma mv$, where v is the speed of the particle, and $\lambda_{b}=h/p=h/\gamma mv$.

The article is interesting and well-written, but I cannot recommend publication of this article on the basis of Sections 1 to 6 since, in my opinion, it contains no new or unexpected results. Sections 7 and 8 are outside of my area of expertise, so I have no comment on them.