Review of: "Is Charge-Energy Conversion More Energetic Than Mass-Energy Conversion?"

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Potential competing interests: No potential competing interests to declare.

My comments for the second version of the article entitled:

Is Charge-Energy Conversion More Energetic Than Mass-Energy Conversion?

Same as the mass-energy equivalence relation which is found from Einstein's special relativity, the author tries to find an equivalence relation between the electric charge and the energy. He used the double copy theory which takes on a relation between the constants (the charges) of the gauge field theories and the quantum gravity. By using the gravitational Wilson lines and the perturbation series expansion of the background metric about the Minkowski flat metric up to the first order, he obtained a relation between the electric charge coupling constant of the QED and the Newton's gravity coupling constant. He also found the charge-energy equivalence principle by using the Lorentz transformations in special relativity. It seems that all the calculations given in the article are correct, but in my opinion, the manuscript has low novelty because of reasons which I will state below.

1- From section 2.2, we find that `energy per mass is equal to square of light speed`, which in MKS units is on the order of 10^17 (L/m=c^2=10^17), while from equation 12 given in section 3.2, we find that the `energy per charge is equal to 10^5 (L/g=1/(4pi G)^1/2=10^5)`. This shows that for the same emitted energy, the mass of the moving particle has an energetic role with respect to its charge.

2- The calculations of the manuscript can be repeated for the QCD or the Yang-Mills or other kinds of gauge theories with the same results, and thus the charge `g` should be considered every type of charge in gauge field theory, not just the electric one. Thus, the statement given in this version of the paper, where the electric charge has an energetic role with respect to the mass of the particle, cannot be a correct result.

Because of the above points, the author should improve his statement with potential and powerful improvements.

Sincerely yours,

HGH