Review of: "Can electromagnetic fields form tensors in a polarizable medium?"

Gerson Otto Ludwig[1]

1 National Institute for Space Research, Brazil

Potential competing interests: No potential competing interests to declare.

Unfortunately, the author did not comment my previous review. Recalling the review of version 1, it is necessary to construct a consistent model to properly account for the interaction between the electromagnetic field and matter. For example, the simplest model for the permeability would be to assume a general relation like μ(A), which becomes a constant only for an isotropic, homogeneous, infinite medium. Considering equation (19), in the general case it is not possible to divide though by μ(A) without writing out all terms of the curl operation on A/μ(A). This is possible only if μ is constant, which is assumed by the author when setting up the modified gauge condition. In this case, the division by a constant factor corresponds to a simple rescaling or change of units of both B and A. If the author still wishes to consider an isotropic, homogeneous medium, without any boundary condition, the consistency of equations (24) and (25) requires εμ=1, the velocity of light in the ideal medium. In this case, these equations describe the propagation of electromagnetic waves in the ideal medium in the presence of the embedded free charges. If the interaction of waves with the free charges is considered, it is still necessary to set up equations of motion for the charges in the presence of the fields.

I still think that the paper is interesting, but the author must reformulate his conclusions according to the above comments. Any result of a mathematical model must be interpreted according to its physical content. The current understanding is that only the total stress-energy tensor has clear physical meaning.