Review of: "Can the electromagnetic fields form tensors if D = ϵE and H = B/μ?"

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The article "Can the electromagnetic fields form tensors if D=ϵE and H=B/μ?" considers the possibility of forming the electromagnetic field tensor in the presence of a polarized medium. The author performs analytical calculations and comes to the conclusion that in the case of D=ϵE and H=B/μ (polarized medium) it is impossible to form a relativistic tensor G^{μv}, which is formed from the auxiliary vectors of the electromagnetic field D and H. The author also points out that the electromagnetic field tensor F^{μv}, which is formed from the initial fields E and B, cannot be formed either. The author notes that there is no evidence in the literature for the possibility of the formation of G^{μv}.

The problem considered in the article is not new and has already been discussed in the scientific community. The web site "https://physics.stackexchange.com/questions/7291/can-d-and-h-form-an-in-materials-version-of-the-electromagnetic-tensor" provides further statements on this issue. Users of the site claim that it is possible to form the tensor G^{μv} using D and H, but that it is not as useful and natural as the tensor F^{μv} using E and B. They refer to the authoritative source "A.O. Barut, Electrodynamics and classical theory of fields & particles. New York: Dover Publications, 1980". Examining this source, one finds that page 96 deals with the case of a polarized medium, where two antisymmetric tensors G^{μv} and K^{μv} are formed, which are used to write Maxwell's equations in covariant form. In addition, this source mentions the more general case where the permittivity and permeability can take a tensor form.

Note also that the question of the constancy of ϵ and μ is important. Under the conditions of motion of a polarized medium, ϵ and μ are not constant. In such a case, the material equations should be replaced by the Minkowski equations. Therefore, it is necessary either to extend the consideration of the influence of ϵ and μ by means of the Minkowski equations or to specify the assumptions of constancy of ϵ and μ in the paper. The formation of electromagnetic field tensors in a moving material medium, including the Minkowski equations, is described in detail in the source "V.A. Ugarov, Special Theory of Relativity. Moscow: Nauka, 1977". See paragraphs 6.3 to 6.15. The original is in Russian, but an English translation is available.

As for editorial comments, the author should have increased the number of references. In addition, it would have been useful to add references to some well-known formulas.