

Review of: "Representation of physical quantities: From scalars, vectors, tensors and spinors to multivectors"

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Potential competing interests: No potential competing interests to declare.

The historical part of the paper contains a synthesis of various operations and properties of objects derived from linear algebra for the sake of differential geometry or for the classification of real algebras. This part contains a lot of information but lacks a clear range of criteria used to characterise or to compare the objects presented. Although it is very clear that the exposition goes from simpler to more complicated objects, various commentaries done around the discussed objects give a sensation of chaos. The reader gets confused.

The authors promised at the beginning a general notion that would be able to shed some light on this zoology of linear and quadratic tensors: the notion of multivector (or geometric algebra), which generalises the whole story, simplifies it, and will be able to bring more. Unfortunately, there is NO definition of multivector in this paper, and the promised generalisation just does not come. It was a deception for me to see that the authors just make different suggestions about how the multivectors should act, but neither define nor construct them. The frustration is even bigger because the authors really convince us that we need a more general object with fewer rules and more flexible properties.

In the first line, the authors should systematically present the criteria for commenting on and comparing vectorial and tensorial objects.

Second, I wish that the authors do this promised and unaccomplished step in a correct and rigorous manner from the beginning. The paper must start with the definition, the properties, and the rules of computation of the more general object announced by the authors. And all the remaining content should be transformed into a treasure trove of examples which show that all classical objects are indeed particular cases of the authors' innovation.

Also, a new section should be written on the philosophy of the more general object. This section is missing now as well, but the reasons are different: it is now missing because it lacks the object.