4th International Conference on Physics

September 17-18, 2018 | Berlin, Germany

Quaternions for singlet states of quantum particles

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T he following presentation proposes a way to construct quaternions describing singlet states of quantum particles. The given method follows from an entangled-part theory(EPT). The basic relation of EPT is the division relation, which is pre-ordering; the anti-symmetry is rejected. Anti-symmetry is necessary for establishing order on elements, but in some cases it can be too restrictive since it excludes duality; i.e. it glues objects together that are symmetric. In the proposed theory we define an ordering in terms of the division relation. Moreover, we apply the rejection of anti-symmetry for definition of indistinguishable objects. In this way, within EPT we can interpret singlet states of quantum particles. The obtained results suggest that there exist two pairs of quaternions, and they are the only quaternions generating singlet states because they are generators of the same finite group. Quaternions that form a pair have the same angles of rotation, and the same vectors, designating the axis of rotation; however, the rotations are in opposite directions. Finally, once quaternions for singlet states were created, we may be able to generalize the method, and create pairs of quaternions for any, finite number of entangled particles. Such research is in progress.

Recent Publications:

- 1. L Obojska (2013) Some remarks on supplementation principles in the absence of anti-symmetry. Review of Symbolic Logic 6(2):343-347.
- 2. L Obojska (2013) At the foundations of collective set theory; on non-anti-symmetric mereology. Wyd. UPH w Siedlcach ISSN 2082-5684.

Biography

Lidia Obojska has completed her PhD in 1999 from Warsaw University, and her habilitation in 2014 from Polish Academy of Science in Warsaw. She is a Professor at Siedlce University, and the Head of the Department of Mathematics and Physics. She has published papers in the field of mathematics and physics. She wrote a book on a non-classical collective set theory, and has been serving as a referee in several journals.

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