

Review of: "The Standard Model Symmetry and Qubit Entanglement"

Carlos Senise¹

¹ Universidade Federal de São Paulo

Potential competing interests: No potential competing interests to declare.

The article is interesting and aims to explain the matter content and symmetries of the standard model through a relationship between entangled states and preferred directions in a dimensional reduction process. The author presents an interesting discussion about the relationship between states of one, two and three qubits (in $3+1$, $5+1$ and $9+1$ dimensions, respectively), division algebras and Hopf fibrations.

The introduction, with a brief summary about the "quantum first" program, is also very interesting. However, the discussion of area-law and entanglement entropy seems to have no relation with what is discussed in the rest of the text, besides a brief motivation. For example: what would be the relationship between the quantum mutual information (Eq. 1 and Figs. 1 and 2), the entangled state presented in section V and the discussion regarding the quantum factorization problem and quantum mereology at the conclusion? Is there any relation?

The work carried out by the author, that is, what is in fact original, is presented only in section V. Despite being interesting and undoubtedly pointing to future developments, the model still lacks improvements capable of providing a more detailed explanation about the symmetries and parameters of the standard model. In fact, this is pointed out by the author himself in the conclusion.