Review of: "Properties of elementary particles, dark matter, and dark energy"

Masoumeh Moazzen Sorkhi[1]

1 Kosar University of Bojnord

Potential competing interests: No potential competing interests to declare.

In this article, Author can discuss the concept of Elko spinors and their potential relevance to dark matter. He can also highlight the ongoing research and theoretical developments in the field of particle physics and their implications for our understanding of dark matter and dark energy.

The Elko spinor field is a theoretical concept in particle physics that goes beyond the standard model. Elko stands for "Eigenspinoren des Ladungs Konjugations Operators" in German, which translates to "eigen-spinors of the charge conjugation operator." These spinors were first introduced by Ahluwalia and Grumiller in 2004. Elko spinors have intriguing properties that make them of interest in the context of dark matter and dark energy. They are characterized by being massive and having both left- and right-handed components, unlike the usual Weyl spinors that only have one chirality. Elko spinors are also self-conjugate, which means they are invariant under charge conjugation. In terms of dark matter, Elko spinors have been proposed as potential candidates for explaining the nature of dark matter particles. Dark matter is a form of matter that does not interact with electromagnetic radiation and does not emit, absorb, or reflect light. It is believed to make up a significant portion of the matter in the universe, but its exact nature and composition remain unknown. Elko spinors offer a new perspective in the search for dark matter particles. Regarding dark energy, which is the mysterious force that is driving the accelerated expansion of the universe, there is no direct connection between Elko spinors and dark energy. Dark energy is typically associated with the cosmological constant or a scalar field known as quintessence. However, it is worth noting that Elko spinors are part of the broader exploration of particle physics beyond the standard model, which aims to uncover new fundamental particles and forces that could potentially shed light on the nature of dark energy.