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Weyl and Majorana for Neutral Particles

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We compare various formalisms for neutral particles. It is found that they contain unexplained contradictions. Next, we investigate the spin-1/2 and spin-1 cases in different bases. Next, we look for relations with the Majorana-like field operator. We show explicitly incompatibility of the Majorana ansatz with the Dirac-like field operators in both the original Majorana theory and its generalizations. Several explicit examples are presented for higher spins too. It seems that the calculations in the helicity basis only give mathematically and physically reasonable results. They can be discussed in the context of recent observational controversies with solar and atmospheric neutrinos.

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