How to construct self/anti-self charge conjugate states for higher spins? (From neutrino to photon and all that)

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We construct self/anti-self charge conjugate (Majorana-like) states for the $(1/2, 0) \oplus (0, 1/2)$ representation of the Lorentz group, and for higher spins within the quantum field theory. The problems of the basis rotations and that of the selection of phases in the Dirac-like and Majorana-like field operators are considered. The discrete symmetries properties (P, C, T) are studied. The corresponding dynamical equations are presented. We further review several experimental consequences which follow from the previous works of M. Kirchbach *et al.* on neutrinoless double beta decay, and G.J. Ni *et al.* on meson lifetimes.