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Mathematical Physics

Helicity -- from Clifford to Graphene

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We investigate two seemingly disjoint definitions of helicity, one commonly used in particle physics, the other one used when studying bilinear covariants of Clifford algebras. We can prove that the `mathematical' definition of helicity implies its `physical' counterpart. As an unexpected application of our result we show that the Hamiltonian describing the one-layer superconductor Graphene is proportional to the trace of an operator that is used in the `mathematical' definition of helicity.

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