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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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