



A UNIFIED 4D SPINOR SPACE FOR DIRAC AND WEYL SPINORS: A VECTOR-SUM DECOMPOSITION OF THE DIRAC SPINOR

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Communicated by Ramon G. Calvet

We introduce a novel four-dimensional spinor representation of the Lorentz group in which both Dirac and Weyl spinors are realized as four-component objects living in a common vector space. Furthermore, Dirac spinors can be expressed as vector sum – rather than a direct sum – of left- and right-chiral four-component Weyl spinors. In this representation, Dirac spinors and their left and right components transform under the same spinor space, permitting an unambiguous identification of their chiral constituents. This formalism provides a symmetric and geometrically transparent reinterpretation of Weyl and Dirac spinors and may offer new insights into extended spinor models and relativistic field theories.

MSC 2020: 22E43, 22E70, 53B30

Keywords: Clifford Algebra, Lie Algebras, Lorentz Group, Dirac and Weyl Spinors

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