Dirac Spinors and Representation of General Linear Coordinate Transformations

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Abstract

Transformation properties of the Dirac equation correspond to the Spin(3,1) representation of the Lorentz group SO(3,1), but the group GL(4,$\mathbb{R}$) of general linear coordinate transformations does not accept a similar construction with Dirac spinors. On the other hand, it is possible to look for representation of GL(4,$\mathbb{R}$) in some bigger space, where Dirac spinors are formally situated as some "subsystem." We describe the construction of such a representation, using Clifford and Grassmann algebras of 4D space.