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High Spins as Lorentz- and Spinor-Tensor Carrier Spaces of the Lorentz Group and a Road toward Quantization

Abstract

A Lagrangian formalism of second order in the momenta has been elaborated that allows to describe the $(j,0)+(0,j)$ high spin carrier spaces of the Lorentz- group as either Lorentz , or, spinor tensors strictly describíng single spins without auxiliary conditions. The correct number of degrees of freedom and their irreducibility are identified by properly designed momentum independent projectors shaped by the Casimir invariants of the Lorentz group. Different properties of the particles such as electromagnetic multiple moments and Compton scattering cross sections have been calculated finding pretty good agreement with data, and avoiding several of the pathologies known to plague high spin theories, among them acausal propagation in electromagnetic environments and unitarity violation in the ultraviolet. We furthermore blaze the trail towards a consistent quantization of high spin Majorana fields in the Spinor-Tensor basis.

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