

## Unifying Colour $SU(3)$ with $\mathbb{Z}_3$ -Graded Lorentz-Poincaré Algebra

*Thursday, December 3, 2020 5:20 PM (50 minutes)*

A generalization of Dirac's equation is presented, incorporating the three-valued colour variable in a way which makes it intertwine with the Lorentz transformations. We show how the Lorentz-Poincaré group must be extended to accommodate both  $SU(3)$  and the Lorentz transformations. Both symmetries become intertwined, so that the system can be diagonalized only after the sixth iteration, leading to a six-order characteristic equation with complex masses similar to those of the Lee-Wick model. The spinorial representation of the  $\mathbb{Z}_3$ -graded Lorentz algebra is presented, and its vectorial counterpart acting on a  $\mathbb{Z}_3$ -graded extension of the Minkowski space-time is also constructed. Application to new formulation of the QCD and its gauge-field content is briefly evoked.

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