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Exotic Quark Decay in the 331 Model: LHC Prospects and Computational Techniques

We discuss a computational approach to the analysis of the 331 Model in Frampton's version with $\beta = \sqrt{3}$. The model generalises the $SU(2)_L \times U(1)_Y$ weak sector of the Standard Model to $SU(3)_L \times U(1)_X$ and it predicts exactly three generations through the cancellation of gauge anomalies within an inter-generational framework. One additional feature of the model is the presence of Bileptons, which are gauge bosons of charge ± 2 , due to the specific embedding of the $U(1)_{em}$ symmetry into the generalised electroweak structure. We show how to build a computational interface that allows to automatize and expand the analysis of this complex model. In particular we discuss its implementation in the code SARAH, the interface with SPheno and SSP, and perform the study of the decay of exotic quarks present in the model into Bileptons and ordinary quarks at the LHC using MadGraph5.

The analysis is contained in a paper in preparation.

Giorno preferito

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