

Study of Higgs potential in an abelian extension of the Standard Model

An extension of the Standard Model of elementary particles (SM) is studied to explain the mass hierarchy of fermions. This extension is based on the assumption of a new non-universal abelian $U(1)$ 'interaction, which introduces extra fermions for the cancellation of chiral anomalies. As a consequence, an extended scalar sector is necessary to use, which consists of three doublets and one Higgs singles. In the case of doublets, their gaps have a hierarchy in their values to hundreds of GeV, units of GeV and hundreds of MeV, in order to satisfactorily describe the mass scales of the fermions. On the other hand, the singles break the non-universal symmetry and give mass to the extra fermions and bosons.

In this poster is calculated with the Higgs potential more general than can be constructed With 3 Higgs doublets and one Scalar singles invariant under this new non-universal symmetry and minimizing the potential the mass matrices and the self mass states with their respective rotation matrices for the charged bosons, the CP-pairs and CP-odd bosons. Diagonalizing the matrices we obtain the three Goldstone bosons of the SM and an extra one that would be associated with the new gauge boson, a lightweight Higgs boson was obtained in the order of the electroweak vacuum expectation value, so it is interpreted as the Higgs boson of 125 GeV and also was obtained new scalar bosons whose masses are at the TeV scales.

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Authors: Mr RAFAEL ANDREI, Vinasco Soler (Universidad Nacional de Colombia); MARTINEZ, Roberto (Universidad Nacional de Colombia)

Presenter: Mr RAFAEL ANDREI, Vinasco Soler (Universidad Nacional de Colombia)

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