

A Horizontal Three-Higgs-Doublet-Model

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I'll present a variant of the Three-Higgs-Doublet Model (3HDM), referred to as the BGL-3HDM, which incorporates a $U(1)_1 \times U(1)_2$ symmetry that leads to a 'horizontal' Yukawa structure, where a particular doublet is the primary source of mass for a particular fermion generation. In the version considered here, the Yukawa matrices in the down-quark and charged-lepton sectors are diagonal, thereby confining tree-level FCNCs interactions mediated by nonstandard scalars to the up-quark sector only. Additionally, apart from the free BSM parameters that appear in Natural-Flavor-Conservation (NFC) versions of 3HDMs with a $U(1)_1 \times U(1)_2$ symmetry, no new BSM parameters are introduced by the Yukawa sector of the model, making it as economical as the NFC versions of 3HDM. However, even in the down-quark and in the charged-lepton sectors, flavor-diagonal but nonuniversal Higgs couplings set this model apart from the NFC versions of the 3HDMs.

Primary author: PRASAD, Anugrah (Indian Institute of Technology Indore)

Presenter: PRASAD, Anugrah (Indian Institute of Technology Indore)

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