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Multi-Higgs Doublet Models and Softly-Broken Symmetries

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Despite the successes of the Standard Model (SM), several fundamental questions remain unanswered. Motivated by this, extensions such as Multi-Higgs Doublet Models (NHDMs) have been proposed. NHDMs enlarge the scalar sector of the SM, leading to a rapid growth of the parameter space, which makes the imposition of symmetries particularly important.
This work focuses on Two- and Three-Higgs Doublet Models (2HDMs and 3HDMs, respectively), constrained by discrete and continuous symmetries, either exact or softly broken, and on the stability of these constraints under renormalisation group (RG) evolution. The analysis resulted in the derivation of the one-loop β functions for the most general 3HDM and to the identification of a novel 3HDM constrained by a GOOFy symmetry.

Field of Research/Work

Particles and Fields

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