

Multiboson signals in the UN2HDM

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Cascade decays of new particles like a heavy Z' gauge boson might produce distinctive experimental signatures that are still uncovered by new physics searches at the Large Hadron Collider. We introduce in this work the UN2HDM, which enlarges the gauge symmetry of the Next-to-two-Higgs doublet model (N2HDM), a Standard Model extension with two complex Higgs doublets and one complex Higgs singlet, with an extra $U(1)$ group. For regions of UN2HDM's parameter space allowed by theoretical and experimental constraints, we show that multiboson signals with sizeable branching ratios may arise, as a result of cascade decays of heavy Z' bosons. These results motivate the development of new physics searches that cover multiboson signals, in particular those observed in the context of the UN2HDM.

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