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Type II seesaw in an extended Two Higgs Doublet Model

General Two Higgs Doublet Models (2HDM) are popular Standard Model extensions but feature flavor changing interactions and lack neutrino masses. We revisit a 2HDM where neutrino masses are generated via type I seesaw and propose an extension where neutrino masses are generated via a type II seesaw mechanism and flavor changing interactions are absent via the presence of a U(1) gauge symmetry. After considering a variety of bounds such those rising from higgs, collider physics and electroweak precision we show that our model stands as an interesting extension of the general Two-Higgs-Doublet Model. Possible dark matter realizations are also discussed.

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