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New constraints on extended Higgs sectors from the trilinear Higgs coupling

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The trilinear Higgs coupling λ_{hhh} is crucial for determining the structure of the Higgs potential and for probing possible effects of physics beyond the Standard Model (SM). Focusing on the Two-Higgs-Doublet Model as a concrete example, we identify parameter regions in which λ_{hhh} is significantly enhanced with respect to the SM. Taking into account all relevant corrections up to the two-loop level, we show that already current experimental bounds on λ_{hhh} rule out significant parts of the parameter space that would otherwise be unconstrained. We illustrate the interpretation of the results on λ_{hhh} for a benchmark scenario. Similar results are expected for wide classes of models with extended Higgs sectors.

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