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New constraints on extended Higgs sectors from the trilinear Higgs coupling

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The trilinear Higgs coupling λhhh 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 λhhh 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 λhhh rule out significant parts of the parameter space that would otherwise be unconstrained. We illustrate the interpretation of the results on λhhh for a benchmark scenario. Similar results are expected for wide classes of models with extended Higgs sectors.

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