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Current status of Two-Higgs-Doublet models with a softly broken Z_2 symmetry

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One of the most popular extensions of the Standard Model is the Two-Higgs-Doublet model (2HDM), in which a second Higgs doublet is added to the conventional Standard Model particle content. 2HDM's with a softly broken Z_2 symmetry avoid flavour-changing neutral Higgs currents at tree-level. They also comprise the Higgs sector of the Minimal Supersymmetric Standard Model. Current Higgs observables put strong constraints on these models. We present global fits to these data and combine them with information from theoretical bounds, electroweak precision observables and the most important flavour constraints, using the open-source package HEPfit. The resulting limits on the 2HDM parameters like mixing angles, the heavy Higgs masses as well as the allowed Higgs mass splittings will be discussed.

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