

# Phenomenology 2021 Symposium



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## The THDMa revisited

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The THDMa is a new physics model that extends the scalar sector of the Standard Model by an additional doublet as well as a pseudoscalar singlet and allows for mixing between all possible scalar states. In the gauge eigenbasis, the additional pseudoscalar serves as a portal to the dark sector, with a priori any dark matter spins states. The option where dark matter is fermionic is currently one of the standard benchmarks for the experimental collaborations, and several searches at the LHC constrain the corresponding parameter space. However, most current studies constrain regions in parameter space by setting all but 2 of the 12 free parameters to fixed values. I discuss a generic scan on this model, allowing all parameters to float. All current theoretical and experimental constraints are taken into account, including bounds from current searches, recent results from B-physics, as well as bounds from astroparticle physics. We identify regions in the parameter space which are still allowed after these have been applied and which might be interesting for an investigation at current and future collider machines.

### Summary

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