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## Interference effects in resonant di-Higgs production at the LHC in the Higgs singlet extension

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We investigate the size of interference effects between resonant and non-resonant contributions to di-Higgs production in the singlet extension of the Standard Model, where the additional heavy scalar provides a resonant channel. We find these interference contributions to have a non-negligible effect on the cross-sections and differential distributions. In order to allow for a computationally efficient treatment of these effects via reweighting, we introduce a new tool utilising a matrix-element reweighting method: *HHReweigher*. In addition to the broadly used di-Higgs invariant mass  $m_{hh}$ , we analyse the sensitivity to the interference terms for other kinematic variables, such as the Higgs boson transverse momentum, and find that these also can be sensitive to interference effects. Furthermore, we provide updates on the latest experimental and theoretical limits on the parameter space of the real singlet extension of the Standard Model Higgs sector.

### Secondary track

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