

## NEW PERSPECTIVES IN CONFORMAL FIELD THEORY AND GRAVITY

HELMHOLTZ

26 - 29 September 2023 DESY Hamburg, Germany



Contribution ID: 301

Type: **not specified**

## Higgs pair production at the LHC in the 2HDM

*Wednesday 27 September 2023 15:06 (22 minutes)*

Probing the Higgs potential through the measurement of the trilinear Higgs coupling is one of the main goals of particle physics. Large deviations from the Standard Model (SM) prediction can be accommodated in models with extended Higgs sectors while being in agreement with all existing experimental and theoretical constraints. In the framework of the Two Higgs Doublet Model, we study the potential sensitivity to the SM-like trilinear Higgs coupling and the BSM triple Higgs coupling involving a resonantly produced CP-even heavier Higgs boson. For this purpose, we analyze the theoretical prediction of the total Higgs pair production cross section and the invariant mass distribution of two SM-like Higgses in the final state at the LHC. We show that the inclusion of loop corrections to the trilinear Higgs coupling is crucial to exclude regions of otherwise unconstrained parameter space. Finally, we discuss the applicability of resonant and non-resonant Higgs pair production experimental limits for testing the predictions of extended Higgs sectors.

### Summary

**Primary authors:** WEIGLEIN, Georg (T (Phenomenology)); RADCHENKO SERDULA, Kateryna (T (Phenomenology)); Prof. MÜHLEITNER, Milada Margarete (Karlsruhe Institute of Technology (KIT)); HEINEMEYER, Sven (IFCA (CSIC, Santander))

**Presenter:** RADCHENKO SERDULA, Kateryna (T (Phenomenology))

**Session Classification:** Parallel Session Wednesday: Phenomenology I

**Track Classification:** Particle Phenomenology