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Higgs Pair Production in a Composite 2HDM

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Content :

In composite Higgs models the Higgs boson is not an elementary particle, but of composite nature, emerging as a pseudo Nambu-Goldstone boson of a strongly interacting sector. In a composite 2-Higgs-Doublet Model (2HDM) a 2HDM-like structure is generated but with couplings already predetermined by the composite nature of the model. In this talk, we present Higgs pair production through gluon fusion at the LHC in a composite 2HDM. We give a brief introduction into the model and an overview over the calculation, highlighting the new couplings and diagrams contributing to di-Higgs production. Applying the most relevant theoretical and experimental constraints, we scan the parameter space of the model. For the obtained allowed parameter scenarios we present and discuss the impact on Higgs pair production from new heavy top quarks and from resonant Higgs pair production both for the inclusive cross section and for the distributions.

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