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Higgs Pair Production via Vector Boson Fusion at the LHC

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The measurement of Higgs pair production will be one of the cornerstones of the LHC physics program in the coming years, with the upcoming of the high-energy and high-luminosity phase.

The Vector Boson Fusion (VBF) production channel probes directly the coupling of new physics and of Higgs to gauge bosons, in addition to reducing background contribution.

In the VBF channel, the production of Higgs pairs is sensitive to the strong interactions of a composite Higgs boson, and would allow a direct extraction of the $hhVV$ quartic coupling. Other anomalous couplings of the Higgs to itself or to vector bosons would also lead to modified production rate and kinematics.

In addition, the production via VBF of an heavy object on-shell, subsequently decaying to a Higgs boson pair, may occur: the case of a kk -graviton from warped extra dimension models will be taken as a benchmark.

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