

First ECFA WORKSHOP.

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Studies of di-Higgs production at the FCC-hh in the $bbZZ(l\nu\nu)$ final state

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The FCC-hh is a proposed circular hadron collider at an energy of 100 TeV. The total integrated luminosity is expected to be around 30 ab^{-1} . With such a large dataset, 400 times more double-Higgs events are expected than with the full HL-LHC dataset, allowing to measure the Higgs self-coupling with high precision. As a consequence, also rarer final states, which are not within reach of the (HL)-LHC, have good prospects at the FCC-hh. One such final state is the $bbZZ(l\nu\nu)$ channel, which has only an Branching Ratio of 0.12%. With a regular cut-based analysis the potential of this channel is very limited.

This study implements a multivariate analysis using neural networks to see if it is a feasible channel that can be used to help to improve the Higgs self-coupling measurement.

Upper limits on the di-Higgs production cross-section are derived in order to assess the potential of this channel.

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