

# Measuring $\lambda_{hhh}$ Using $HH \rightarrow bbbb$ at HL-LHC — A Feasibility Study

A study into the feasibility of measuring the Higgs self-coupling,  $\lambda_{hhh}$  using the high luminosity LHC is presented.

Reconstructing the variation in the di-Higgs invariant mass distribution with  $\lambda_{hhh}$  is essential to measuring this parameter well. Simulated signal data is used to demonstrate the challenges in doing this.

The above simulated signal data is then used in combination with additional simulated background data to present a sample analysis using a neural network to:

1. Separate signal from background, and
2. Discriminate signals corresponding to differing  $\lambda_{hhh}$

This sample analysis is used to determine the significance with which a signal could be expected to be measured, and the limits which could be expected on  $\lambda_{hhh}$ .

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