

W + W – H production through bottom quarks fusion at hadron colliders

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With the standard model working well in describing the collider data, the focus is now on determining the standard model parameters as well as for any hint of deviation. In particular, the determination of the couplings of the Higgs boson with itself and with other particles of the model is important to better understand the electroweak symmetry breaking sector of the model. In this

letter, we look at the process $pp \rightarrow W W H$, in particular through the fusion of bottom quarks. Due to the non-negligible coupling of the Higgs boson with the bottom quarks, there is a dependence on the $W W H H$ coupling in this process. This sub-process receives the largest contribution when the W bosons are longitudinally polarized. We compute one-loop QCD corrections to various final states with polarized W bosons. We find that the corrections to the final state with the longitudinally polarized W bosons are large. It is shown that the measurement of the polarization of the W bosons can be used as a tool to probe the $W W H H$ coupling in this process. We also examine the effect of varying

$W W H H$ coupling in the κ -framework.

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