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Triple Higgs Boson Self-Coupling in a $\gamma\gamma$ Collider

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Abstract content

We analized the double production and the triple self-coupling of the standard model Higgs boson at future $\gamma\gamma$ collider energies, with the reactions $\gamma\gamma \to f\bar{f}HH$ $(f = b, t)$. We evaluated the total cross section for $f\bar{f}HH$ and calculated the total number of events considering the complete set of Feynman diagrams at tree-level. We varied the triple coupling $\kappa\lambda_{HHH}$ within the range $\kappa = -2$ and $+2$. The numerical computation was done for the energy which is expected to be available at a possible Future Linear $\gamma\gamma$ Collider with a center-of-mass energy $500 - 3000\ GeV$ and luminosities of 1000 and 5000 fb^{-1}. We found that the number of events for the process $\gamma\gamma \to t\bar{t}HH$, taking into account the decay products of both t and H, is enough to obtain an accurate determination of the triple Higgs boson self-coupling.

Summary

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