

Higgs Boson Production via Higgs Strahlung $e+e- \rightarrow (Z, Z') \rightarrow Zh$ and ttH , at Future $e+e-$ Linear Colliders in the Context of a $U(1)$ B-L Extension of the Standard Model

Abstract

We study the phenomenology of the light h and heavy H Higgs boson production and decay in the context of a $U(1)$ B-L extension of the standard model with an additional Z' boson at future $e+e-$ linear colliders with center-of-mass energies of $\sqrt{s} = 500 - 3000$ GeV and integrated luminosities of $\mathcal{L} = 500 - 2000$ fb $^{-1}$. The study includes the processes $e+e- \rightarrow (Z, Z') \rightarrow Zh$ and $e+e- \rightarrow (Z, Z') \rightarrow ZH$, and ttH , considering both the resonant and non-resonant effects. We find that the total number of expected Zh and ZH events can reach 106 and 105, respectively, which is a very optimistic scenario allowing us to perform precision measurements for both Higgs bosons h and H , as well as for the Z' boson in future high-energy and high-luminosity $e+e-$ colliders experiments. Our study complements other studies on the B-L model and on the Higgs-strahlung processes $e+e- \rightarrow (Z, Z') \rightarrow Zh$ and $e+e- \rightarrow (Z, Z') \rightarrow ZH$.

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