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Probing Chirality of Top-Higgs FCNC Couplings at Linear Colliders

Friday, July 7, 2017 3:00 PM (15 minutes)

We study the nature of the flavor changing neutral couplings of the top quark with the Higgs boson and the up/charm quark in the $t\bar{t}$ production at linear colliders. There are previous bounds on such tqH couplings at both, linear and hadronic colliders, with the assumption that it couples equally to the left and the right handed fermions. In this paper we examine the chirality of the tqH coupling and construct different observables which will be sensitive to it. It was found that in particular the off-diagonal basis can be useful to distinguish among the chiral tqH couplings. The sensitivity of the unpolarized ILC in probing the couplings at the 3σ level at $s\sqrt{L} = 500$ GeV and $L = 500$ fb $^{-1}$ is also studied, resulting in predicted $BR(t \rightarrow qH) < 1.19 \times 10^{-3}$. This limit is further improved to $BR(t \rightarrow qH) < 8.84 \times 10^{-4}$ with the inclusion of initial beam polarization of left handed electrons and right handed positrons.

Experimental Collaboration

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