

Neutral Higgs Boson Pair Production in Standard Model with the Fourth Generation Quarks at LHC

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Abstract: We investigated the neutral Higgs boson pair production at the CERN Large Hadron Collider (LHC) in the SM with four families. We found that the gluon-gluon fusion mode is the most dominant one in producing neutral Higgs boson pair at the LHC, and it can be used to probe the trilinear Higgs coupling. If the heavy quarks of the fourth generation really exist within the SM, they can manifest their effect on the cross section of the Higgs pair production process at the LHC. Our numerical results show that there will be 2×10^4 neutral Higgs boson pair production events per year if the next generation heavy quarks really exist, while there will be only 2×10^3 events produced per year if there are only three families in the SM.

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Key words: standard model, four generations, neutral Higgs boson pair production, hadron collider

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