The Standard Model (SM) for elementaly particles which are based on $SU(2) \times U(1)$ gauge theory has been very successful below the electroweak scale. The Higgs boson has key roles which trigers the electroweak symmetry breaking, and provides masses for weak gauge fields and matter fermions. It has not been found yet experimentally and is expected its discovery and measurements of its properties at future colliders. In a theoretical sense, the SM Higgs sector is undeveloped. In particular, as for the Higgs boson mass there appears a quadratic divergence from radiative corrections. To deal with this divergence, lots of new physics models are proposed. Thus searches for Higgs bosons is useful to distinguish the new physics beyond the SM.

In this thesis, it is reviewed the role of SM Higgs boson. Limits for mass of the SM Higgs boson from current experimental data and theoretical considerations are shown. Higgs boson production mechanism at future colliders and its decays are also explained.

Next, we discuss the Yukawa interaction between top-quarks and the Higgs boson. This interaction can have an information of the electroweak symmetry breaking and of the particularity of top-quark. In this paper, we study the impact of non-standard interactions characterized by dimension-six operators on collider phenomenology. The cross section of the process $e^-e^+ \to W^-W^+\nu\bar{\nu} \to t\bar{t}\nu\bar{\nu}$ is calculated including these operators, and possible deviation from the SM prediction is evaluated under the constraint from perturbative unitarity and current experimental data. We find that if the new physics scale is in a TeV region, the cross section can be significantly modified due to the non-standard interactions. Such a large effect may be detectable at the International Linear Collider.