

Higgs Physics at Multi-TeV Muon Collider

Muon collisions at multi-TeV center-of-mass energies are ideal for studying Higgs boson properties. At these energies the production rates will allow precise measurements of its couplings to fermions and bosons. In addition, the double Higgs boson production rate could be sufficiently high to directly measure the parameters of trilinear self-couplings, giving access to the determination of the Higgs potential. This communication aims to give an overview of the results that have been obtained so far on Higgs couplings by studying the $\mu\mu \rightarrow H(\rightarrow b\bar{b})\nu\nu$, $\mu\mu \rightarrow H(\rightarrow WW^*)\nu\nu$ and $\mu\mu \rightarrow H(\rightarrow b\bar{b})H(\rightarrow b\bar{b})\nu\nu$ processes. All the studies have been performed with a detailed simulation of the signal and physics background samples and by evaluating the effects of the beam-induced background on the detector performance. Evaluations on Higgs boson couplings sensitivities and results on the uncertainty on double Higgs production cross-section, together with the trilinear self-coupling, will be discussed at a center-of-mass energy of 3 TeV.

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Session Classification: Frontiera dell'energia