Contribution ID: **37** Type: **not specified**

Higgs boson decay width and couplings at muon collider

Monday, 18 July 2022 20:40 (20 minutes)

Among the facilities proposed for the next generation of particle accelerators for High Energy Physics, the muon collider represents a unique machine, which would be able to provide leptonic collisions at energies of several TeV.
Muons collisions at such energy scale holds a remarkable physic potential, both for searches of phenomena beyond the Standard Model, and precision measurements of known processes.
In particular, in the multi-TeV regime, Higgs production rates are so high that Higgs physics measurements, such as its couplings to bosons and fermions and its decay width, can be achieved with unprecedented precision.
This contribution aims to give an overview of the results obtained so far on Higgs couplings and width by studying single Higgs boson production occurring by vector boson fusion (VBF).
All the studies have been performed simulating the relevant physics processes at a 3 TeV muon collider, taking into account the effects of the Beam Induced Background on the detector performance.
The indirect measurement of the Higgs width is possible thanks to the simultaneous search for on-shell and off-shell Higgs boson decaying to a pair of vector bosons ($H \to WW$ and $H \to ZZ$), an analysis strategy already used by LHC experiments.
The knowledge of the Higgs width allows to determine, in a model-independent way, all Higgs boson couplings from $\sigma(\mu^+\mu^- \to H) \cdot BR(H \to xx)$ measurements.

In-person or Virtual?

In-person

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Session Classification: Poster Session