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Detector performance for Higgs physics measurements at muon collider

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The muon collider is the ideal machine for reaching multi-TeV centre-of-mass energy and high luminosity lepton collisions, thanks to the low beamstrahlung and synchrotron radiation loss compared to e^+e^- colliders. In such conditions, the number of produced Higgs bosons will allow to measure its couplings to fermions and bosons with an unprecedented precision.
However, in order to evaluate its physics reaches, the detector performance must be determined, since they may be strongly affected by very high fluxes of particles coming from muons decaying in circulating beams. In this contribution beam-induced background effects on the detector components and physics object reconstruction strategies are discussed. Latest results on jet reconstruction and jet flavour identification performance, evaluated via full simulation of the muon collider detector, are presented.
Most recent results on the precision on the measurement of the $\mu^+\mu^- \rightarrow H\nu\bar{\nu}$ cross section, where the Higgs boson decay in two b-jets, are shown. The signal and the physics background are fully simulated and reconstructed at 3 TeV center of mass energy, including the beam-induced background.

In-person or Virtual?

In-person

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