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Higgs-muon interactions at a multi-TeV muon collider

Wednesday 6 November 2024 15:20 (20 minutes)

We study the capabilities of a muon collider, at 3 and 10 TeV center-of-mass energy, of probing the interactions of the Higgs boson with the muon. We consider all the possible processes involving the direct production of EW bosons (W, Z, and H) with up to five particles in the final state. We study these processes in the HEFT and SMEFT frameworks, assuming that the dominant BSM effects originate from the muon Yukawa sector. Our study shows that a Muon Collider has sensitivity beyond the high-luminosity LHC, especially as it does not rely on the Higgs-decay branching fraction to muons. A 10 TeV muon collider provides a unique sensitivity on muon and (multi-) Higgs interactions, significantly better than the 3 TeV option. In particular, we find searches based purely on multi-Higgs production to be particularly effective in probing these couplings.

Primary track

Higgs physics at future colliders

Is the speaker a PhD student or post-doc?

Yes - I need some financial support (fee reduction) to attend Higgs 2024

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