

Multi-Boson Production and the Muon Yukawa Coupling

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The Higgs boson may be regarded as, on the one hand, the capstone of the glorious arch of the SM or, on the other hand, as the portal giving access to new physics. An open question in particle physics is whether the Higgs mechanism generates the masses of all the fermions by the Yukawa interactions. We propose to study multi-boson production processes and scrutinize the muon Yukawa coupling at a high-energy muon collider. By the subtle interplay between the muon Yukawa coupling in the high-energy productions of multiple (vector and Higgs) bosons, we show that it is possible to measure the muon Yukawa coupling to an accuracy of ten percent for a 10 TeV collider and a few percent for a 30 TeV machine.

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