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Performance of muon identification and isolation with multivariate techniques at the CMS experiment in proton-proton collisions at sqrt(s) = 13 TeV

Muon selection and identification represent a key aspect for many analyses at CMS, either to select the signal final state or to reject background events. We present two multivariate techniques that have been developed for a highly efficient muon identification. One has been trained to distinguish muons either produced promptly in the decay of bosons or nonprompt muons from tau lepton or heavy flavour hadron decays, from background muons produced in light hadron decays (pions or kaons) or other spurious signatures in the detector that could be misreconstructed as muons. This MVA shows efficiencies similar or better than those achieved by the standard selection criteria used during run 2. The second one aims to select prompt muons from W, Z, H bosons or tau leptons decay by using isolation requirements to reduce the contamination from nonprompt muons arising in heavy flavour hadron decays. Reducing such contamination is essential for many analysis targeting prompt decays of Higgs or electronweak bosons. Both algorithms are developed using the 57.9 \fbinv of data produced in proton-proton collisions at a center-of-mass energy of $\sqrt{s}$= 13 TeV and collected during 2018 with the CMS experiment. Their performance has been assessed both in data and simulation.

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