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Inclusive search for a boosted Higgs boson and observation of the Z boson decaying to charm quarks with the CMS experiment

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A search for standard model Higgs bosons produced with transverse momentum greater than 450 GeV and decaying to charm quark-antiquark pairs is performed using proton-proton collision data collected by the CMS experiment at the LHC at 13 TeV. The search is inclusive in the Higgs boson production mode. Highly Lorentz-boosted Higgs bosons are reconstructed as single large-radius jets and are identified using a dedicated tagging technique based on a Deep Neural Network. The method is validated with Z to charm quark-antiquark pair decays and this process is observed for the first time in the Drell-Yan production mode at a hadron collider.

In-person participation

Yes

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