Contribution ID: **111** Type: **not specified**

CMS searches for the Higgs boson decay into charm quark-antiquark pair

Wednesday, November 9, 2022 2:40 PM (15 minutes)

The most recent direct searches for the H⟶cc process by the CMS Collaboration will be presented. The results are obtained using the full Run 2 LHC data collected in proton-proton collisions at a center of mass energy of 13 TeV, targeting the associated production of the Higgs boson with a Vector boson (W or Z boson) and, for the first time, the gluon fusion production mechanism. To fully exploit the Higgs decay topology in the different regimes of the Higgs boson transverse momentum, two strategies have been adopted for the Higgs candidate reconstruction; Either as two well-separated and individually resolved small-radius jets or as a single large-radius jet, which is more relevant for Higgs bosons with higher momentum. The analyses build on novel machine learning-based algorithms for charm quark(s) identification, and jet and mass regression. The analyses are validated by observing the VZ, Z⟶cc, and the Drell-Yan, Z⟶cc processes for the first time at a hadron collider experiment. The results represent the world's most stringent constraints on Higgs-charm Yukawa coupling.

Type of talk

Experimental measurements

Presenter: STAMENKOVIC, Marko (Brown University (US))

Session Classification: Wednesday Session A

Track Classification: Physics Topics: Yukawa