Contribution ID: **233** Type: **talk**

Study of inclusive Higgs-boson production at high transverse momentum in the $H \to b\bar{b}$ decay mode with the ATLAS detector

Monday 12 July 2021 15:30 (15 minutes)

The ever-growing interest into high-energy production of the Higgs boson, motivated by an enhanced sensitivity to New Physics scenarios, pushes the development of experimental techniques for the reconstruction of boosted decay products from the Higgs-boson hadronic decays.
This talk will discuss recent studies of inclusive Higgs-boson production with sizable transverse momentum decaying to a $b\bar{b}$ quark pair (ATLAS-CONF-2021-010). The analyzed data were recorded with the ATLAS detector in proton-proton collisions with a center-of-mass energy of $\sqrt{s} = 13$ TeV at the Large Hadron Collider between 2015 and 2018, corresponding to an integrated luminosity of 136 fb^{-1}.
Higgs bosons decaying to $b\bar{b}$ are reconstructed as single large-radius jets and identified by the experimental signature of two b-hadron decays. The analysis takes advantage of an analytical model for the description of the multi-jet background, and combines multiple regions rich in Higgs-boson signal and specific background signatures. The experimental techniques are validated in the same kinematic regime using the $Z \to b\bar{b}$ process.
For Higgs-boson production at transverse momenta above 450 GeV, the production cross section is found to be 13±57(stat.)±22(syst.)±3(theo.) fb. The differential cross section 95% confidence level upper limits as a function of Higgs boson transverse momentum are $_H$(300<p_{T}^H<450 GeV)<2.8 pb, $_H$(450<p_{T}^H<650 GeV)<91 fb, $_H$(p_{T}^H>650GeV)<40.5 fb, and $_H$(p_{T}^H>1TeV)<10.3 fb. Evidence for the production of $Z- > b\bar{b}$ with $p_{\mathrm{T}}^Z >$ 650 GeV is obtained. All results are consistent with the Standard Model predictions.

Are you are a member of the APS Division of Particles and Fields?

No

Author: Dr SCIANDRA, Andrea (University of California,Santa Cruz (US))

Presenter: Dr SCIANDRA, Andrea (University of California,Santa Cruz (US))

Session Classification: Higgs & Electroweak Physics

Track Classification: Higgs & Electroweak Physics