Contribution ID: **319** Type: **Oral**

A study of the VH associated production process

Wednesday, 17 April 2019 15:30 (15 minutes)

Analyzed the experimental data of ATLAS obtained in proton-proton collisions in Run-2 LHC at a centre-of-mass energy of 13 TeV for the period 2015-2017, corresponding to an integrated luminosity of 79.8fb^-1. The Run 2 VH, H → bb result is further combined with the results of other Run 2 searches for the Higgs boson produced in the VH production mode, but decaying into either two photons or four leptons via ZZ decays. For a Higgs boson mass of 125 GeV, and assuming the relative branching fractions of the three decay modes considered to be as predicted by the SM, the observed significance for VH production is 5.3 standard deviations, to be compared with an expectation of 4.8 standard deviations. Assuming the branching fractions are as predicted by the SM, the fitted value of the VH signal strength for all channels combined is:
μ = 1.13 ± 0.15(stat.)+0.18−0.17(syst.).
These observation is direct evidence of the discovery of associative production of the Higgs boson and the vector boson.

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Session Classification: High energy physics

Track Classification: High Energy Physics