

# Observation of the $VH(\rightarrow bb)$ associated production in pp collisions with the ATLAS detector

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Since the discovery of the Higgs boson, rapid progresses in understanding its properties and couplings have been performed. In particular, measurements of the Higgs boson decays to fermions permit to test the Yukawa couplings and to understand the mass generation of fermions. In the Standard Model, the  $H \rightarrow bb$  decay is the most prevalent decay with a branching ratio of 58%, but experimentally at LHC it's difficult to observe because of the large backgrounds from multijet in the dominant gluon gluon production mode. For this reason, the search for the  $H \rightarrow bb$  decay is performed exploiting the associated production of a Higgs boson with a  $W$  or a  $Z$  boson ( $V=W/Z$ ), whose leptonic decays make the signature of these processes easier to identify. This talk describes the search for the  $VH(\rightarrow bb)$  process using pp collision data taken at 13 TeV and presents the results of the combination with the search of  $H \rightarrow bb$  with different production modes and centre-of-mass energies, which lead to the observation of the  $H \rightarrow bb$  decay.

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