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Search for the Standard Model Higgs boson produced in association with a vector boson and decaying to a $b\bar{b}$ pair in p p collisions at 13 TeV using the ATLAS detector

A search for the decay of a Standard Model Higgs boson into a $b\bar{b}$ pair when produced in association with a W or Z boson has been performed with the ATLAS detector. Data were collected in proton-proton collisions from Run 2 of the Large Hadron Collider at a centre-of mass energy of 13 TeV, corresponding to an integrated luminosity of 13.2 fb-1. Final states are considered that contain 0, 1 and 2 charged leptons (electrons or muons), targeting the decays:$Z \longrightarrow \nu\nu$, $W \longrightarrow l\nu$, and $Z \longrightarrow ll$. For mH = 125 GeV the ratio of the measured signal strength to the SM expectation is found to be $\mu = 0.21^{+0.36}_{-0.35}(\text{stat.}) \pm 0.36(\text{stat.})$. This corresponds to an observed significance of 0.42 standard deviations compared with an expected sensitivity of 1.94. The analysis procedure has been validated by measuring the yield of (W/Z)Z with $Z \longrightarrow b\bar{b}$, where the ratio of the observed yield to that expected in the Standard Model was found to be $0.91 \pm 0.17(\text{stat.})^{+0.32}_{-0.27}(\text{stat.})$, corresponding to a significance of 3.0 standard deviations compared to an expected significance of 3.2.

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