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Simplified Template Cross Section measurements of the V(H->bb) process with the ATLAS detector at sqrt(s)=13 TeV

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Presented are the studies of the production of the Standard Model Higgs boson in association with a W or Z boson, where the Higgs decays to $b\bar{b}$ and the W/Z bosons decay leptonically. The $H \rightarrow b\bar{b}$ decay has a branching fraction of $\sim 58\%$, so this study allows the probing of the dominant Higgs decay mode, as well as providing the best sensitivity to the WH and ZH production modes and allowing the study of the Higgs at high transverse momentum. These points are important for the interpretation of the Higgs measurements in Effective Field Theories (EFTs). Since *b*-hadrons are the only down-type hadrons that can be effectively tagged, this decay mode also allows the study of the Yukawa coupling of the Higgs boson to the down-type quarks.\\

The full Run-2 dataset, corresponding to 139 fb⁻¹ of instantaneous luminosity, was collected in proton-proton collisions with the ATLAS detector at a centre of mass energy of $\sqrt{s} = 13$ TeV. The cross-sections of this process were measured using the Simplified Template Cross Section (STXS) method. Here, the cross sections are measured as a function of the W/Z boson transverse momentum in different fiducial volumes based on kinematic cuts. Results of both the resolved (where each *b*-jet is reconstructed as a separate jet) and the boosted (where the two *b*-jets are reconstructed as one fat jet) analyses are shown, as well as the future prospects of the combination of these two different methods.

Apply to be considered for a student ; award (Yes / No)?

yes

Level for award; (Hons, MSc, PhD, N/A)?

PhD

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