

# Search for Higgs boson production in association with a pair of top-quarks with the Atlas detector

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A great success of the Standard Model (SM) was the discovery of a Higgs boson in 2012. Measuring its properties and yet unobserved production and decay modes provides a test of the validity of the SM. The process of Higgs production in association with a pair of top-quarks ( $t\bar{t}H$ ) is still unobserved. Further interest arises from the fact that it provides direct access to the top Yukawa coupling which is possibly sensitive to new physics and therefore provides a crucial test of the SM.

In order to maximize the statistics of the data sample of the  $t\bar{t}H$  process the final state of the Higgs decay with the highest branching ratio into a pair of  $b$ -quarks has been chosen for this search. This summary is based on the recently published results using  $36.1 fb^{-1}$  in pp collisions collected with the Atlas detector in 2015 and 2016. Especially the reconstruction techniques to correctly match the jets originating from  $b$ -quarks to their origin, are reviewed. The measurement in the  $t\bar{t}H(b\bar{b})$  final state is put in context with the combination of the other Higgs decay modes, resulting in evidence for this process.

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