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Search for the Standard Model Higgs boson produced in association with top quarks and decaying into $b\bar{b}$ in pp collisions at $\sqrt{s} = 13$ TeV with the ATLAS detector

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Abstract

A search for the Standard Model Higgs boson produced in association with a top-quark pair, $t\bar{t}H$, is presented. The analysis uses 13.2 fb^{-1} of pp collision data at $\sqrt{s} = 13 \text{ TeV}$, collected with the ATLAS detector at the Large Hadron Collider, with more data to be added. The search is designed for the $H \rightarrow b\bar{b}$ decay mode and uses events containing one or two electrons or muons. In order to improve the sensitivity of the search, events are categorised according to their jet and b -tagged jet multiplicities. Multivariate techniques are used to discriminate between signal and background events, the latter being dominated by $t\bar{t}$ +jets production. No significant excess of events above the background expectation is found. The ratio of the measured $t\bar{t}H$ signal cross section to the Standard Model expectation is found to be $\mu = 2.1 + 1.0 / - 0.9$ assuming a Higgs boson mass of 125 GeV.