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Search for heavy Higgs bosons A/H decaying to a top-quark pair in pp collisions at $\sqrt{s} = 8\text{ TeV}$ with the ATLAS detector

A search for heavy pseudoscalar (A) and scalar (H) Higgs bosons decaying into a top-quark pair ($t\bar{t}$) has been performed in 20.3 fb^{-1} of data collected by the ATLAS experiment at the Large Hadron Collider in proton–proton collisions at a center-of-mass energy of $\sqrt{s} = 8\text{ TeV}$. No significant deviation from the Standard Model expectation is observed in the $t\bar{t}$ invariant mass spectrum in final states with an electron or muon, large missing transverse momentum, and at least four jets. The results are interpreted in the context of a type-II Two-Higgs-Doublet Model in the alignment limit. Interference effects between the signal process and Standard Model $t\bar{t}$ production, which are expected to distort the signal shape from a single peak to a peak-dip structure, are taken into account. Exclusion limits on the signal strength μ are derived as a function of the mass $m_{A/H}$ and the ratio of the vacuum expectation values of the two Higgs fields, $\tan\beta$.

Experimental Collaboration

ATLAS

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