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Search for a new scalar or pseudoscalar heavy Higgs Boson using production of four top quarks at the Large Hadron Collider

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Though the Standard Model has been a very successful theory, there are still many questions left unanswered like incorporation of gravity into SM, neutrino masses, matter-antimatter asymmetry,... One of the possible solutions to address these challenges is the extension of the present SM by incorporating an additional Higgs doublet. This search aims at exploring the presence of a scalar or pseudoscalar heavy Higgs boson as predicted by the Two-Higgs-Doublet-Model (2HDM) produced in an association with a pair of top quarks with heavy Higgs boson decaying further into a pair of top quarks. This analysis uses proton-proton collisions at sqrt(s)=13 TeV, taken by the ATLAS detector. In order to improve the modelling of the most dominant background originating from top-antitop production in association with jets, data-driven corrections are applied. It includes the performance of a powerful multivariate classifier Graph Neural Network used for signal-background discrimination.

I read the instructions above

Yes

Alternate track

1. Beyond the Standard Model

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