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Search for exotic decays of the Higgs boson and additional scalar particles in ATLAS

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The discovery of the Higgs boson with the mass of about 125 GeV completed the particle content predicted by the Standard Model. Even though this model is well established and consistent with many measurements, it is not capable to solely explain some observations. Many extensions of the Standard Model addressing such shortcomings introduce additional Higgs-like bosons which can be either neutral or charged. Exotic decays of the Higgs boson also provide a unique window for the discovery of new physics, as the Higgs boson may couple to hidden-sector states that do not interact under Standard Model gauge transformations. Also, models predicting exotic Higgs boson decays to pseudo-scalars can explain the $g-2$ and flavour-sector anomalies, and the galactic centre gamma-ray excess if the additional pseudo-scalar acts as the dark matter mediator. This talk presents recent searches for additional low- and high-mass Higgs bosons, as well as decays of the 125 GeV Higgs boson to new particles, using LHC collision data at 13 TeV collected by the ATLAS experiment in Run 2.

Summary

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