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Searches for new physics in the Higgs sector

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The discovery of the Higgs boson with a mass of 125 GeV completed the particle content predicted by the Standard Model (SM). 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 SM addressing such shortcomings have additional (neutral or charged) Higgs bosons. In some models, the Higgs boson can also serve as a portal to a dark sector, through e.g. invisible decays. Finally, new physics could also appear through modifications of the cross-section and kinematics of the elusive Higgs boson pair (HH) production process. The current status of searches for additional low- and high-mass Higgs bosons, for invisible Higgs boson decays and for HH production, based on the full LHC Run 2 dataset of the ATLAS experiment at 13 TeV, are presented.

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