

## Search for Higgs boson pair production in the $b\bar{b}\tau\tau$ final state with the ATLAS detector

A search for Higgs boson pair production in events with two  $b$ -jets and two  $\tau$ -leptons is presented, using a proton–proton collision data set with an integrated luminosity of 139/fb collected at  $\sqrt{s} = 13$  TeV by the ATLAS experiment at the LHC. Higgs boson pairs produced non-resonantly or in the decay of a narrow-width scalar resonance in the mass range 251 to 1600 GeV are targeted. Events in which at least one  $\tau$ -lepton decays hadronically are considered, and multivariate discriminants are used to extract the signals. A dedicated analysis extends the mass reach of the HH resonance search up to 3 TeV, where a new technique for reconstructing and identifying hadronically decaying tau-pairs with a large Lorentz boost is developed and used for the first time. The current status of Higgs boson pair-production searches in other channels in ATLAS is also presented.

### What is your topic?

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