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Search for Higgs boson decays to beyond-the-Standard-Model light bosons in four-lepton events with the ATLAS detector at sqrt(s) = 13 TeV

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Summary

Current measurements permit the branching ratio of the SM Higgs to BSM particles to be as high as approximately 30%. Such exotic decays of the Higgs are well-motivated theoretically. Of particular interest is the decay of h to one or two dark sector particles called Zd. This decay occurs in models where h interacts with a dark sector which could have a rich and interesting phenomenology like the SM. A dark sector could naturally address many of the questions left unanswered by the SM.

A search is conducted for the 125 GeV Higgs decaying to one or two new BSM bosons that finally decay to four leptons (l = e, mu). The search uses pp collision data collected with the ATLAS detector at the LHC with an integrated luminosity of 36.1 fb-1. Improvements to the search using the full 2015-8 data-set are also presented.

Primary authors: ATLAS COLLABORATION; CHIU, Yu Him Justin (University of Victoria (CA)); CHIU, Justin (University of Victoria (CA))

Presenters: CHIU, Yu Him Justin (University of Victoria (CA)); CHIU, Justin (University of Victoria (CA))

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