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WITHDRAWN - Search for dark sector particles in Higgs boson decays with the ATLAS detector at the LHC

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The recent discovery of the Higgs boson (h) is an affirmation of the Standard Model (SM) of particle physics and concludes several decades of experimental searches. However, the experimental investigation of its properties has just begun. Current measurements of h properties permit the fraction of h decays to Beyond-Standard-Model (BSM) particles to be as high as approximately 30%. These exotic decays are also 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. The higher rate of h production resulting from the increased proton beam intensity and energy of the Large Hadron Collider (LHC) in the 2015-2018 data-taking run – combined with strong theoretical motivation and tantalizing hints seen in past searches – makes this decay a promising avenue for the discovery of new physics. I will present results from analysis of the 2015-6 data-set, and present extensions and prospects of this search using the full 2015-8 data-set.

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