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The Higgs as a portal to the “hidden sector” via an analysis of $H \rightarrow Z'Z' \rightarrow 4l$

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The Standard Model (SM) has well known deficiencies, and there is clearly need for new physics beyond the SM. The particles manifesting the new physics would interact at most weakly with the SM particles, and hence they are termed “dark”. The Higgs boson is potentially a favourable route for the production of the dark particles. There are a large class of theories where couplings or mixings at the Higgs level leads to exotic Higgs decays, which nonetheless do not significantly disturb the known physics below the Higgs level. This is therefore a significant potential discovery opportunity. We present studies which have been carried out as part of designing the search for the exotic decay of the SM Higgs which proceeds via a dark force back to SM four leptons, $H \rightarrow Z'Z' \rightarrow 4l$.

Apply to be considered for a student award (Yes / No)?

Yes

Level for award (Hons, MSc, PhD)?

PhD

Main supervisor (name and email) and his / her institution

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Would you like to submit a short paper for the Conference Proceedings (Yes / No)?

Yes

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