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## Constraints on new hypothetical particles in the Higgs sector using LHC Run 1 and 2 data

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**Abstract content** (Max 300 words) **Formatting & Special chars**

With Run 2 of the LHC currently underway at a record-breaking energy of 13 TeV centre of mass energy, new physics searches have come to the fore. In particular, the ATLAS and CMS collaborations are beginning to focus more on extending the Higgs sector of the Standard Model. Previous work has shown that Run 1 data from both ATLAS and CMS hint at the existence of a new heavy scalar with a mass around 270 GeV. This work will extend this idea by introducing a full Two-Higgs Doublet Model and outlining the potential Run 2 searches which could constrain the parameters of such a model, should it exist in nature. This will be presented in the context of searches for Higgs production in association with missing energy, leptons and large jet multiplicities. Some preliminary studies related to the rates and kinematic distributions of processes of interest are presented and their implications are discussed.

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

Yes

**Level for award (Hons, MSc, PhD, N/A)?**

MSc

**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

**Please indicate whether this abstract may be published online (Yes / No)**

Yes

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