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High mass VBF Categorization for the four lepton $H \rightarrow ZZ \rightarrow 4l$ final state with the ATLAS detector

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We Categorize VBF-like events using cut-based approach for $n_{\text{jets}} \geq 2$. This study focuses on the VBF signal optimization for the $H \rightarrow ZZ \rightarrow 4l$ channel and the separation of VBF events from the events produced via the gluon-gluon Fusion (ggF) production mechanism. The study is based on the ATLAS full Run2 Monte Carlo at the total luminosity of 140 fb^{-1} . Major background contribution is from the $qq \rightarrow ZZ \rightarrow 4l$ as well as the Electro-weak component of the ZZ background which is important in the VBF category. VBF selection efficiency and ggF rejection maps are used to find the optimal signal selection in the VBF production category for four lepton channel.

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

Yes

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

MSc

Primary author: Mr THABEDE, Mzwandile (University of the Witwatersrand)

Co-authors: Prof. MELLADO, Bruce (University of the Witwatersrand); Dr LAGOURI, Theodota (University of the Witwatersrand); Dr RUAN, XIFENG (WITS)

Presenter: Mr THABEDE, Mzwandile (University of the Witwatersrand)

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