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

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We Categorize VBF-like events using cut-based approach for njets ≥ 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 Electroweak component of the ZZ backgound 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
br> considered for a student
br> award (Yes / No)?

Yes

Level for award

- (Hons, MSc,

- PhD, N/A)?

MSc

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