Higgs $\rightarrow \mu^+\mu^-$ Decay Analysis

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2 Jet Plots

To test how well our Monte Carlo simulations fit the data, we make a variety of plots of different types of events. Specifically, we are interested in plots with 2 jets because these are associated with several types $H \to \mu\mu$ decays. Therefore, we are interested in optimizing our cut values on the 2 Jet plots.

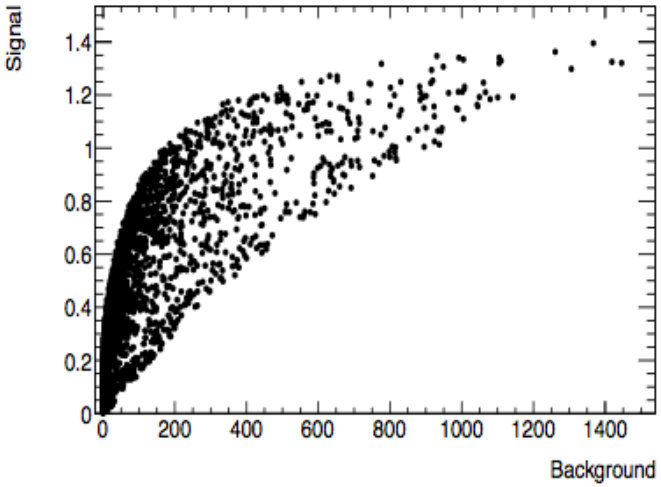
Optimization Methods

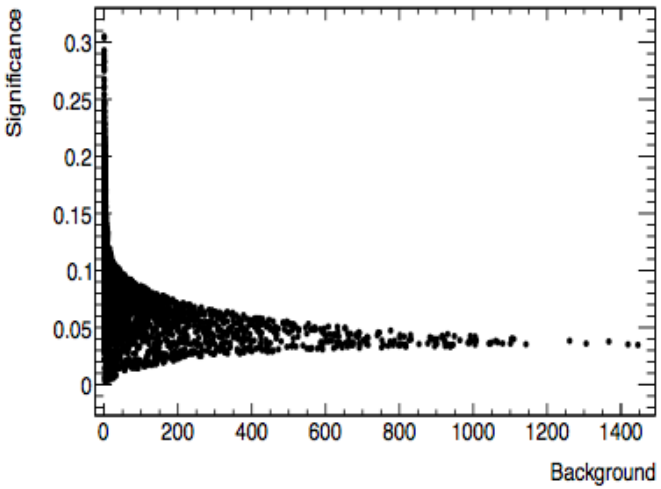
Initially, cuts were optimized manually, but we later decided on a random grid search (RGS) optimization method. The RGS program tries several thousand different grid points, then the optimal value is found by hand.

RGS Plots

Plots for Mjj, DEtajj, PtLL Cut Optimization

Inclusive





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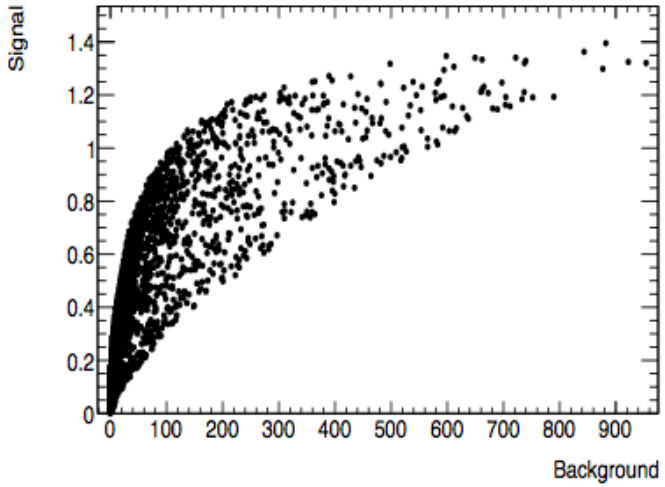

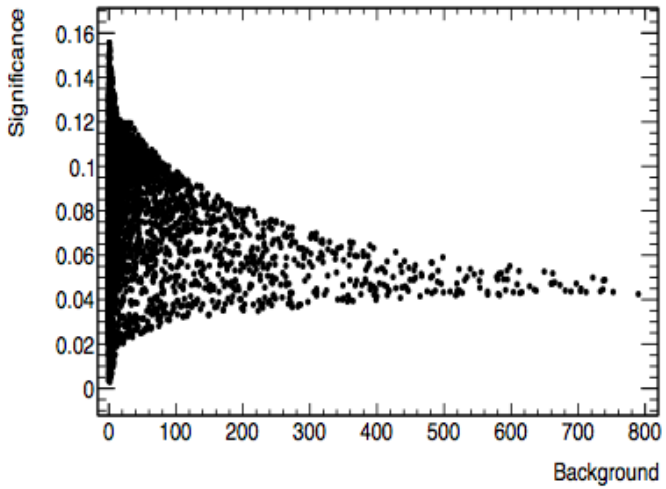

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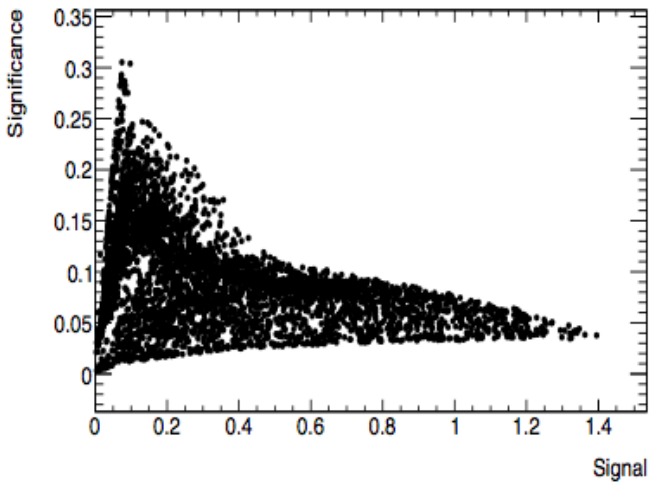

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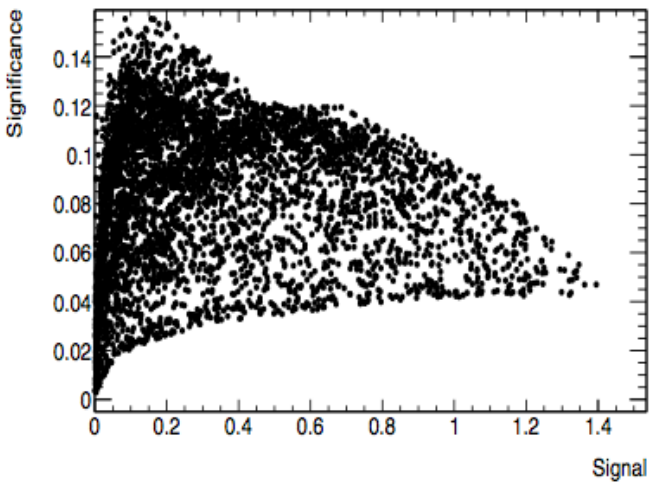

Conclusions

The RGS method runs more quickly than the manual optimization and allows for us to test many more values. This method gives us a better understanding of the effect of the different cuts. However, the actual selection of optimal values has to be done by hand. We currently have no set method of choosing the optimum point.