

# Automatic MVA Evaluation

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## **Abstract**

Evaluation plots

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# 1 Classifiers

This section contains the GeneralOptions and SpecificOptions of all classifiers represented by an XML tree. The same information can be retrieved using the basf2\_mva.info tool.

Table 1: Abbreviations of identifiers

Identifier	Abbreviation
MyContinuum.xml	MyCon

## 1.1 MyContinuum.xml

```
<?xml version="1.0" encoding="utf-8"?>
<method>FastBDT</method>
<weightfile>MyContinuum.xml</weightfile>
<treename>B0Signal</treename>
<target_variable>B0_isSignal</target_variable>
<weight_variable>
<signal_class>1</signal_class>
<max_events>0</max_events>
<number_feature_variables>32</number_feature_variables>
<variable0>B0_cc1</variable0>
<variable1>B0_cc2</variable1>
<variable2>B0_cc3</variable2>
<variable3>B0_cc4</variable3>
<variable4>B0_cc5</variable4>
<variable5>B0_cc6</variable5>
<variable6>B0_cc7</variable6>
<variable7>B0_cc8</variable7>
<variable8>B0_cc9</variable8>
<variable9>B0_mm2</variable9>
<variable10>B0_et</variable10>
<variable11>B0_hso00</variable11>
<variable12>B0_hso01</variable12>
<variable13>B0_hso02</variable13>
<variable14>B0_hso03</variable14>
<variable15>B0_hso04</variable15>
<variable16>B0_hso10</variable16>
<variable17>B0_hso12</variable17>
<variable18>B0_hso14</variable18>
<variable19>B0_hso20</variable19>
<variable20>B0_hso22</variable20>
<variable21>B0_hso24</variable21>
<variable22>B0_hoo0</variable22>
<variable23>B0_hoo1</variable23>
<variable24>B0_hoo2</variable24>
<variable25>B0_hoo3</variable25>
<variable26>B0_hoo4</variable26>
<variable27>B0_ThrustB</variable27>
<variable28>B0_Thrust0</variable28>
<variable29>B0_CosTBT0</variable29>
<variable30>B0_CosTBz</variable30>
<variable31>B0_R2</variable31>
<number_spectator_variables>0</number_spectator_variables>
<number_data_files>1</number_data_files>
<datafile0>/home/ilc/bilokin/mva-test/train.root</datafile0>
<FastBDT_version>1</FastBDT_version>
<FastBDT_nTrees>800</FastBDT_nTrees>
<FastBDT_nCuts>8</FastBDT_nCuts>
<FastBDT_nLevels>4</FastBDT_nLevels>
<FastBDT_shrinkage>0.10000000000000001</FastBDT_shrinkage>
<FastBDT_randRatio>0.5</FastBDT_randRatio>
```

## 2 Variables

This section contains an overview of the importance and correlation of the variables used by the classifiers. And distribution plots of the variables on the independent dataset. The distributions are normed for signal and background separately, and only the region  $\pm 3$  sigma around the mean is shown.

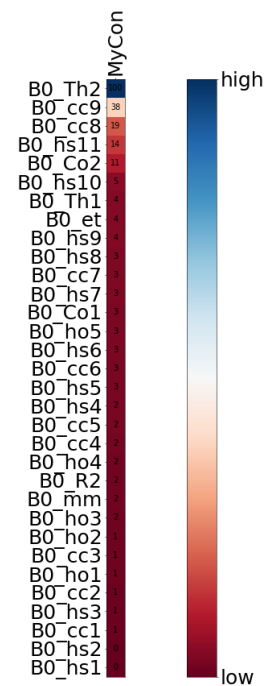
Table 2: Abbreviations of variables

Variable	Abbreviation
B0_hso01	B0_hs1

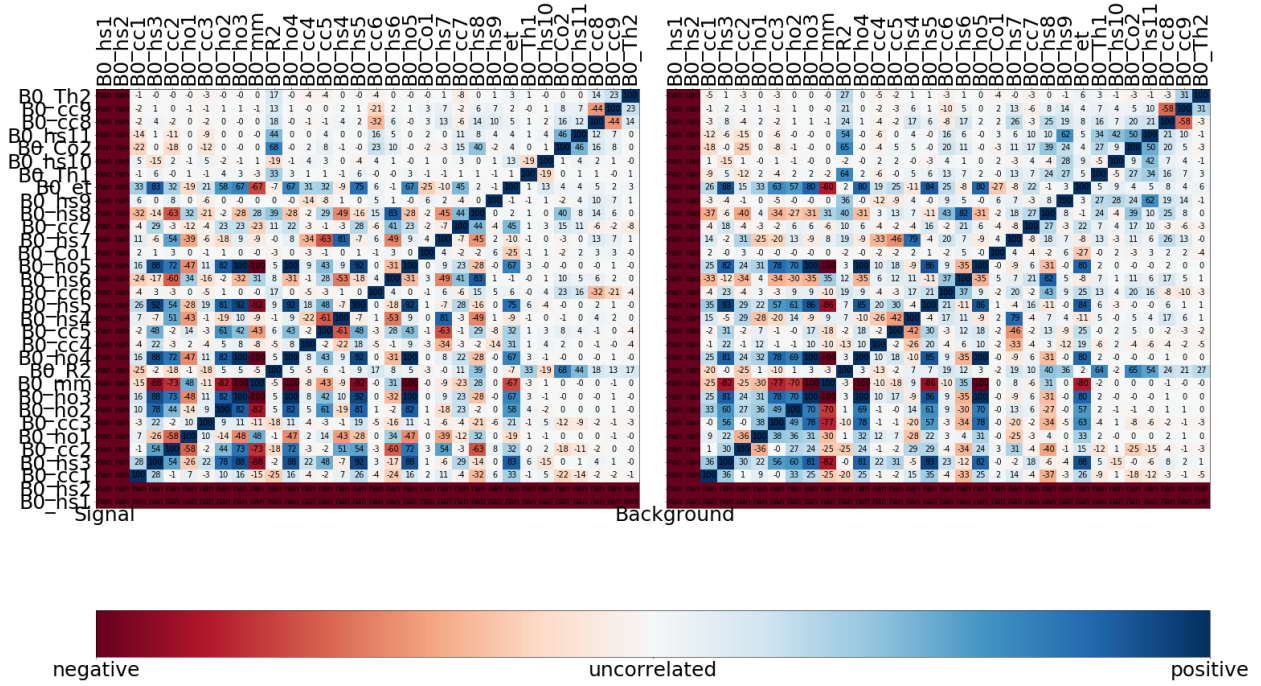
B0_hso03	B0_hs2
B0_cc8	B0_cc1
B0_hso00	B0_hs3
B0_cc9	B0_cc2
B0_hoo3	B0_ho1
B0_cc7	B0_cc3
B0_hoo1	B0_ho2
B0_hoo4	B0_ho3
B0_mm2	B0_mm
B0_R2	B0_R2
B0_hoo2	B0_ho4
B0_cc6	B0_cc4
B0_cc5	B0_cc5
B0_hso24	B0_hs4
B0_hso20	B0_hs5
B0_cc3	B0_cc6
B0_hso22	B0_hs6
B0_hoo0	B0_ho5
B0_CosTBz	B0_Co1
B0_hso04	B0_hs7
B0_cc4	B0_cc7
B0_hso02	B0_hs8
B0_hso14	B0_hs9
B0_et	B0_et
B0_ThrustO	B0_Th1
B0_hso10	B0_hs10
B0_CosTBTO	B0_Co2
B0_hso12	B0_hs11
B0_cc2	B0_cc8
B0_cc1	B0_cc9
B0_ThrustB	B0_Th2

---

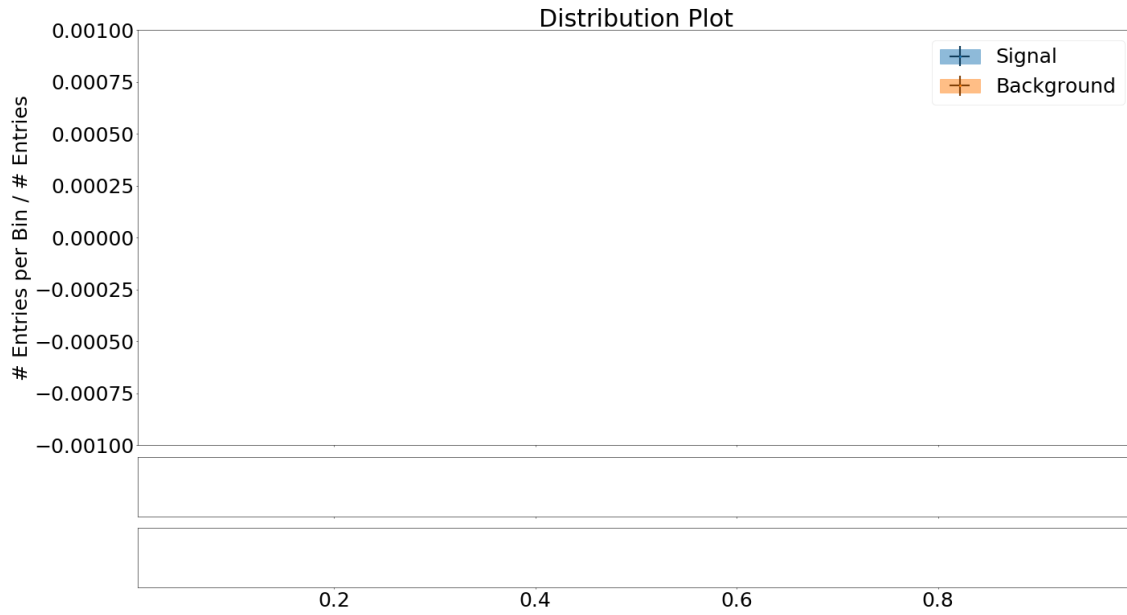
## 2.1 Importance



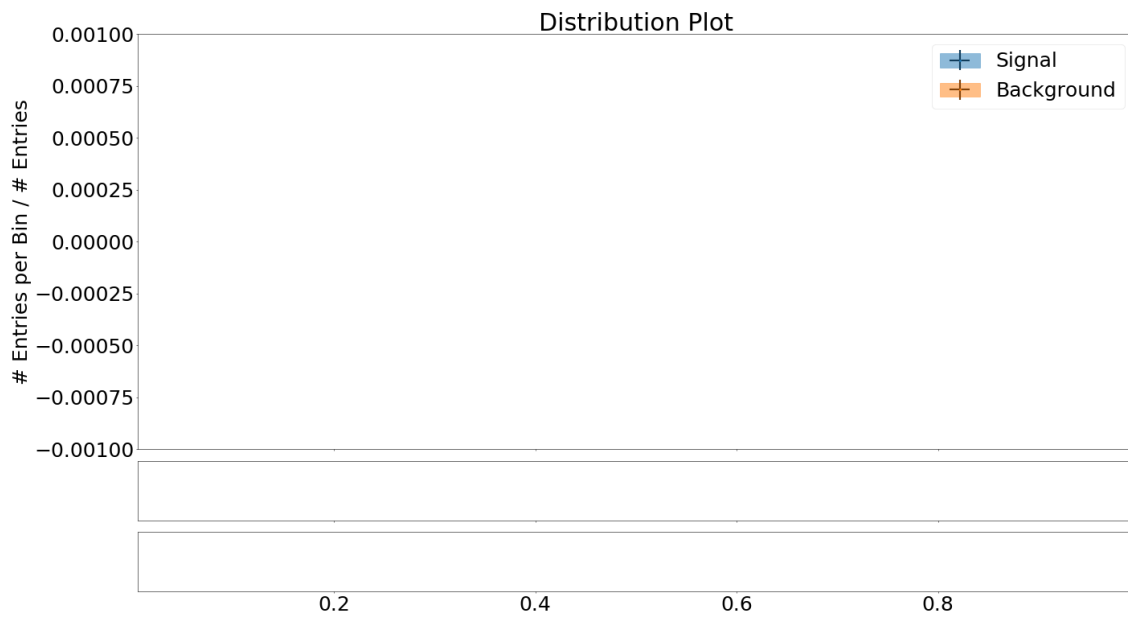
## 2.2 Correlation



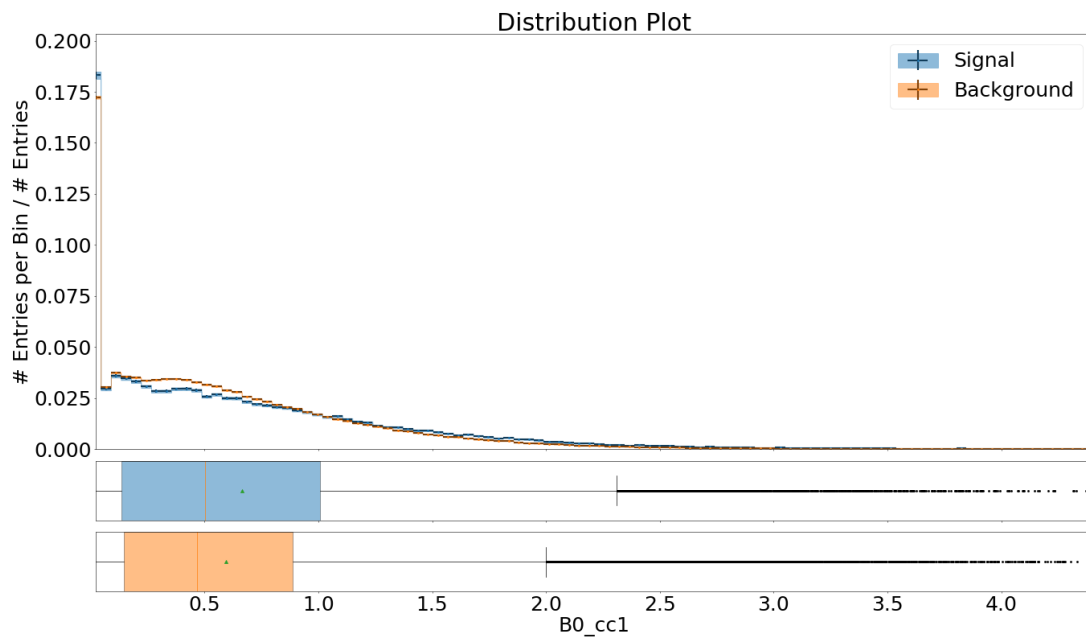
## 2.3 B0\_hso1



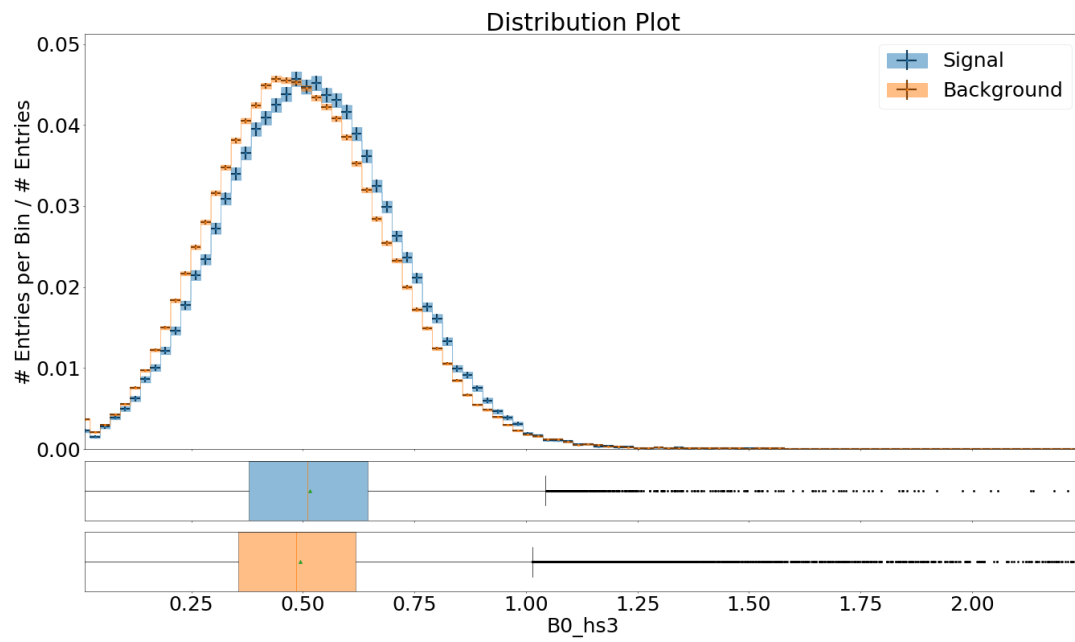
## 2.4 B0\_hso03



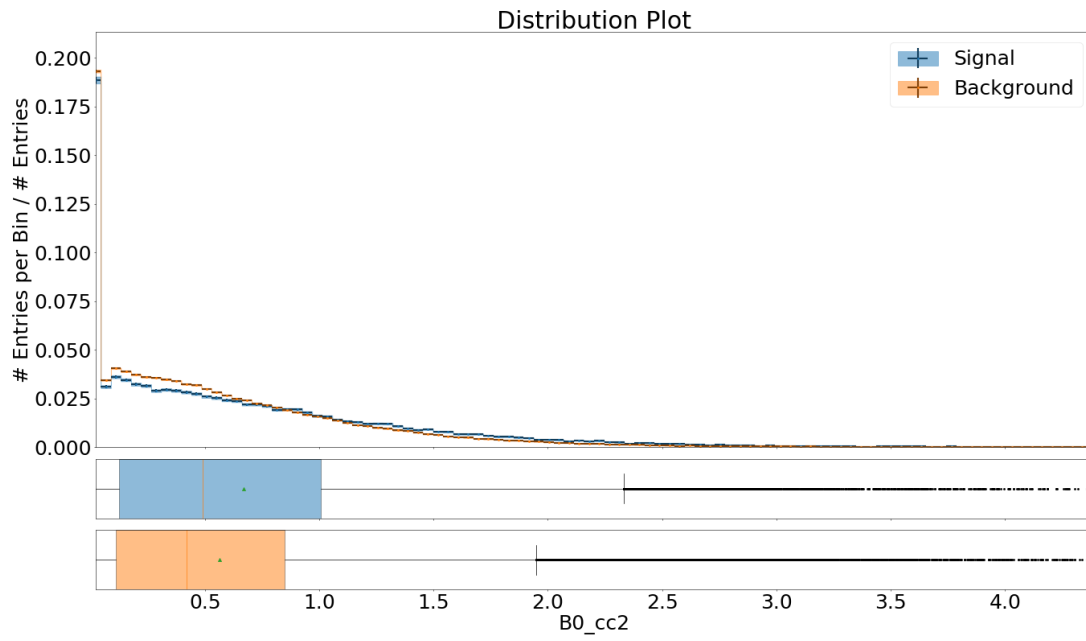
## 2.5 B0\_cc8



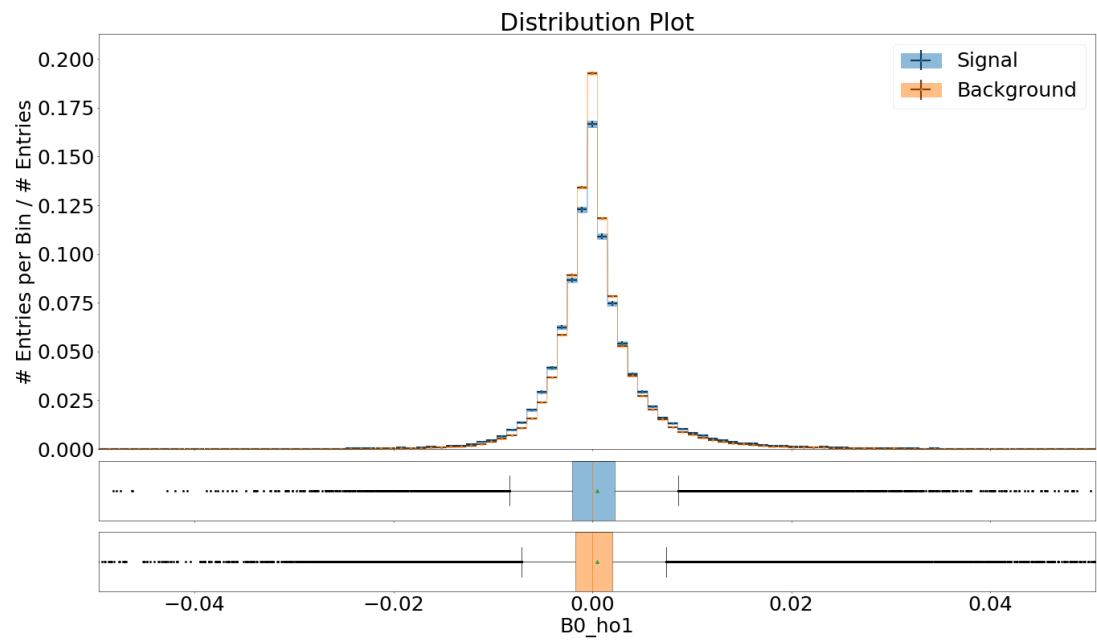
## 2.6 B0\_hso00



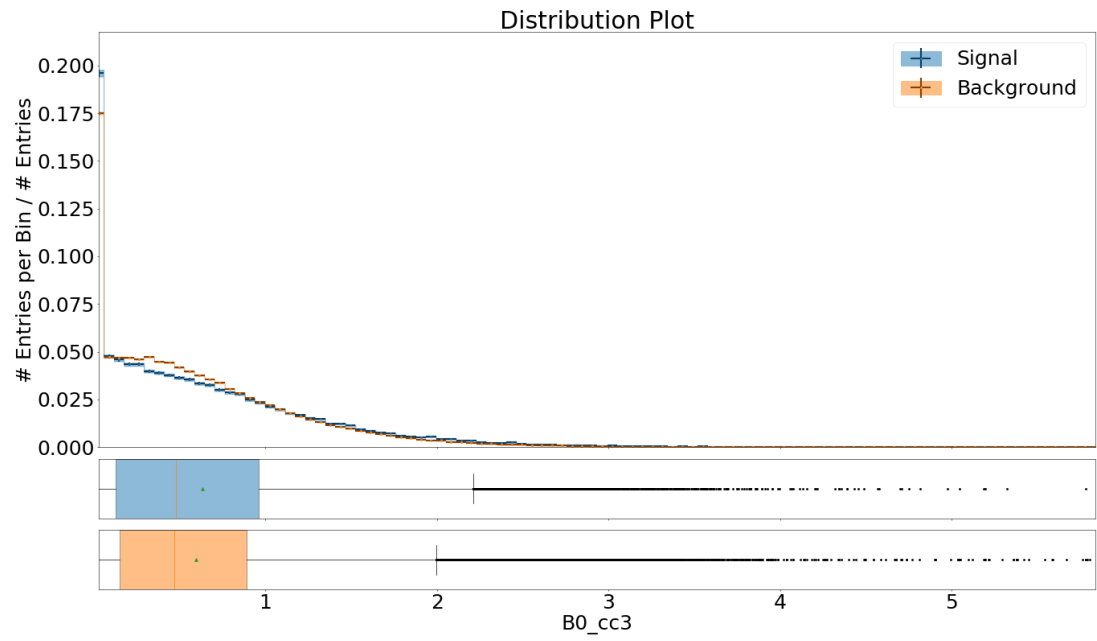
## 2.7 B0\_cc9



2.8 B0\_ho3

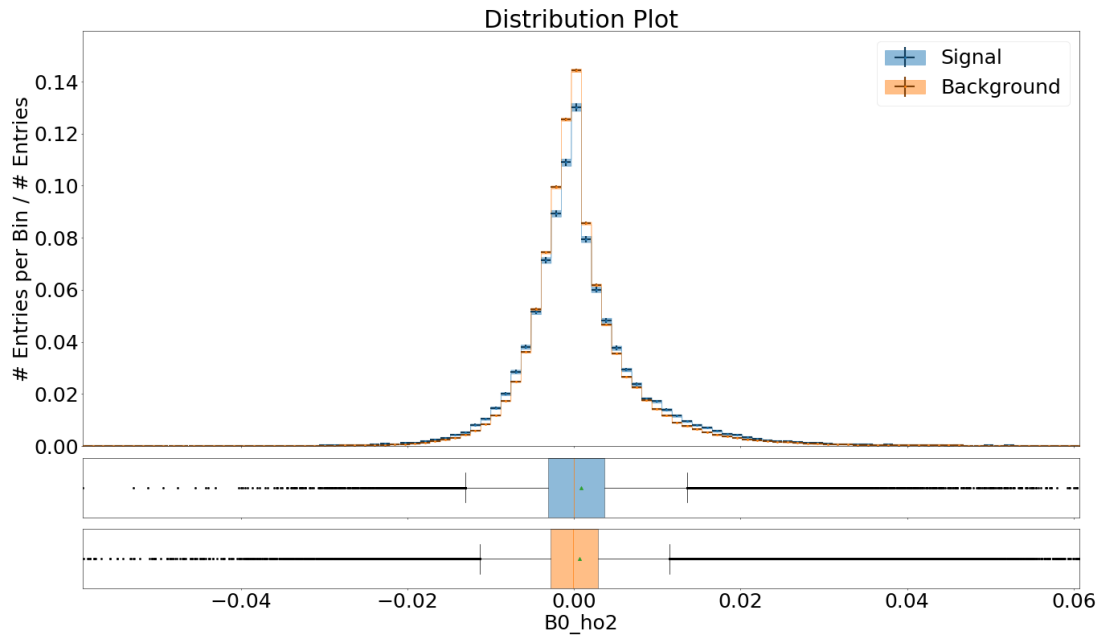


2.9 B0\_cc7

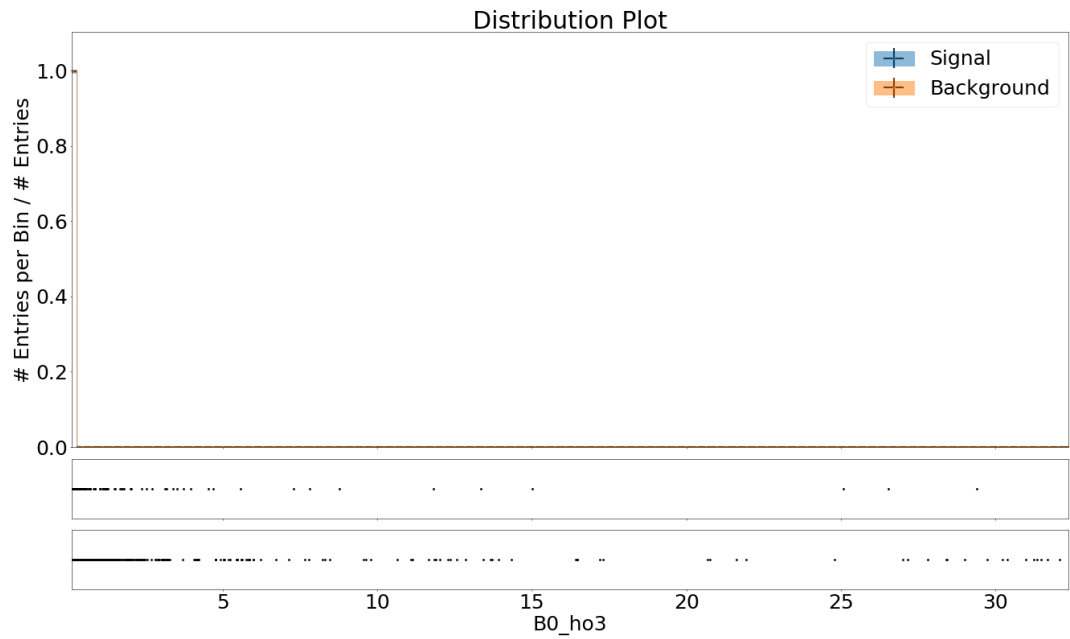




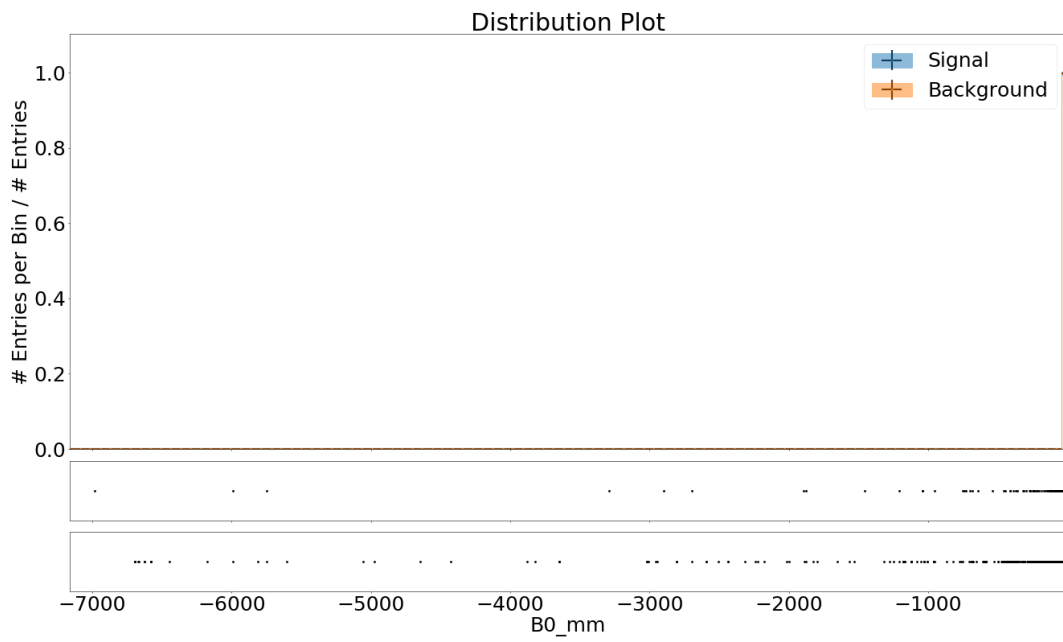
2.10 B0\_ho01



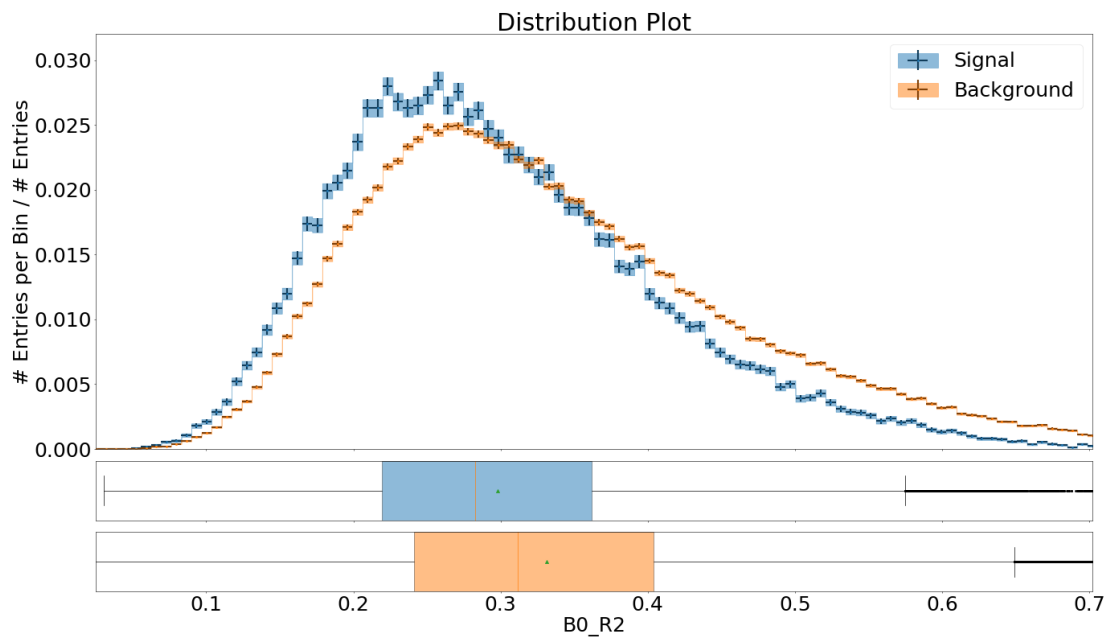
2.11 B0\_ho04



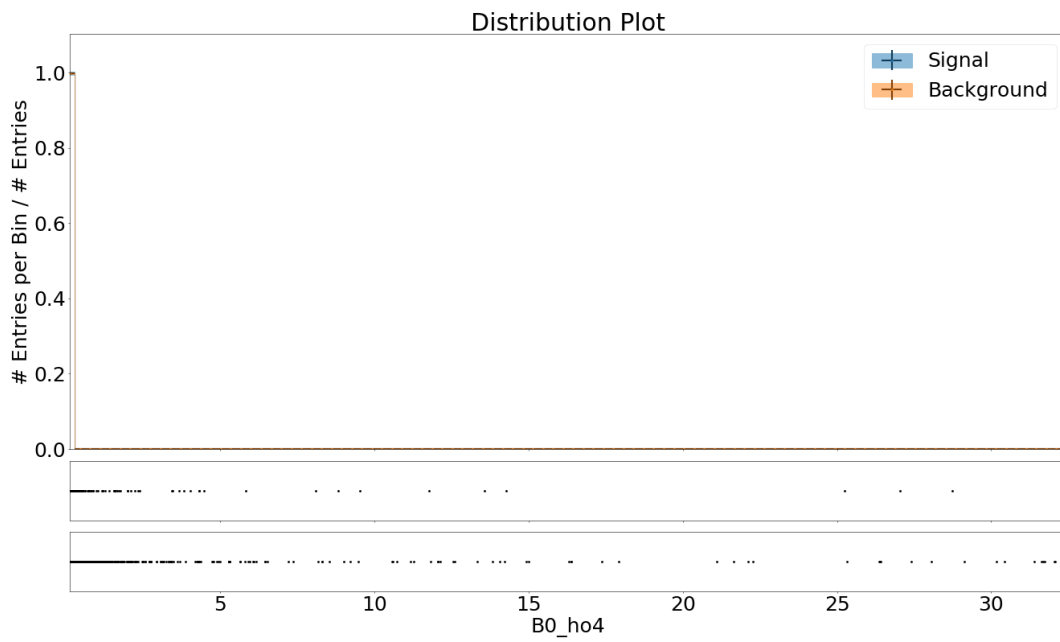
## 2.12 B0\_mm2



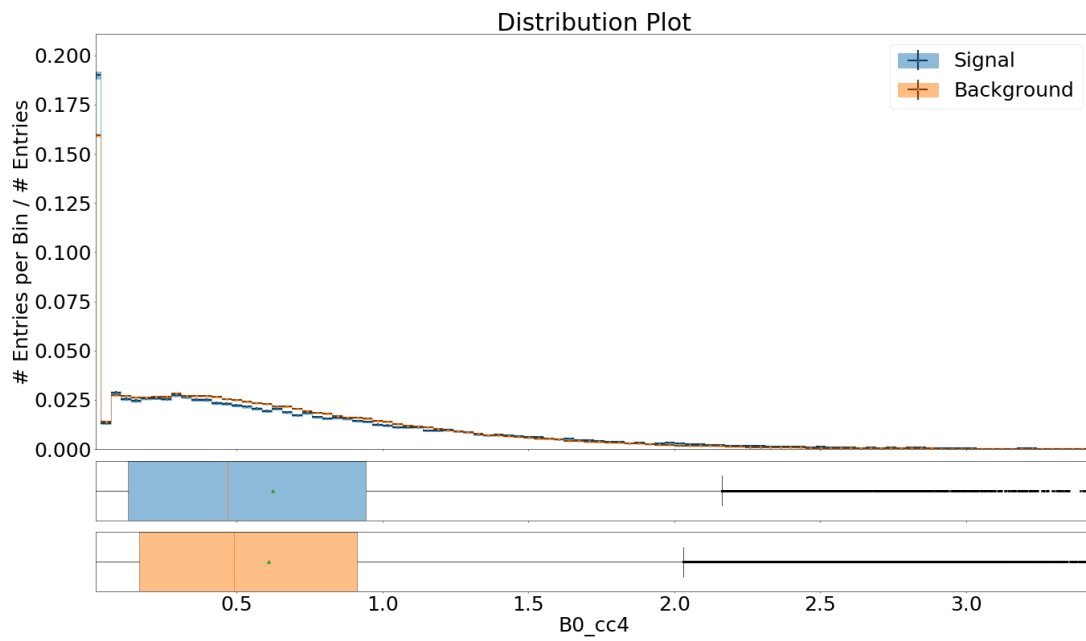
## 2.13 B0\_R2



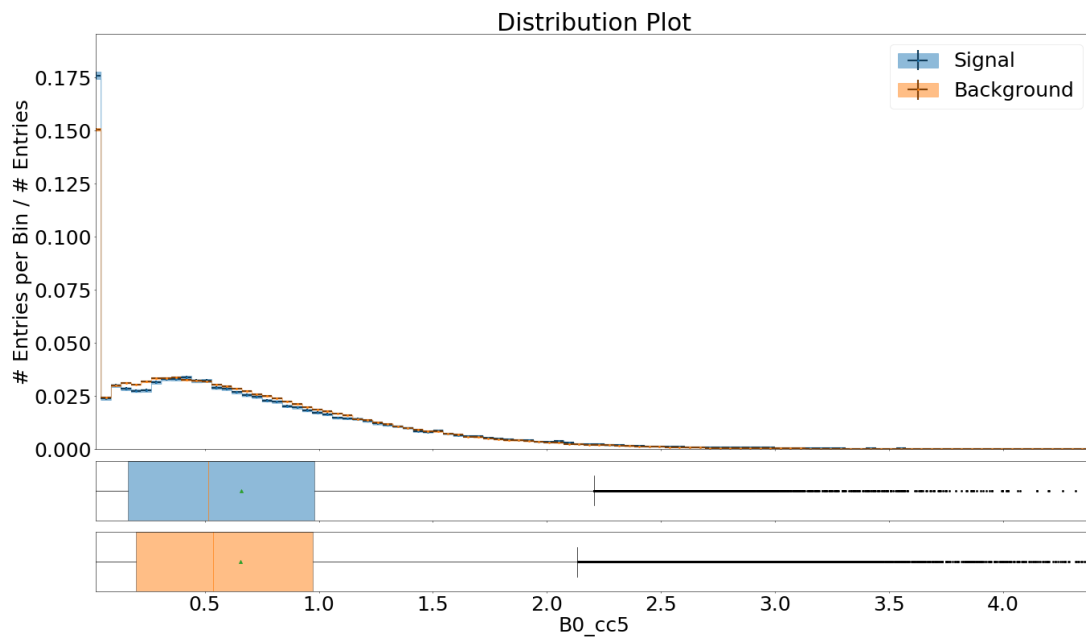
## 2.14 B0\_hoo2



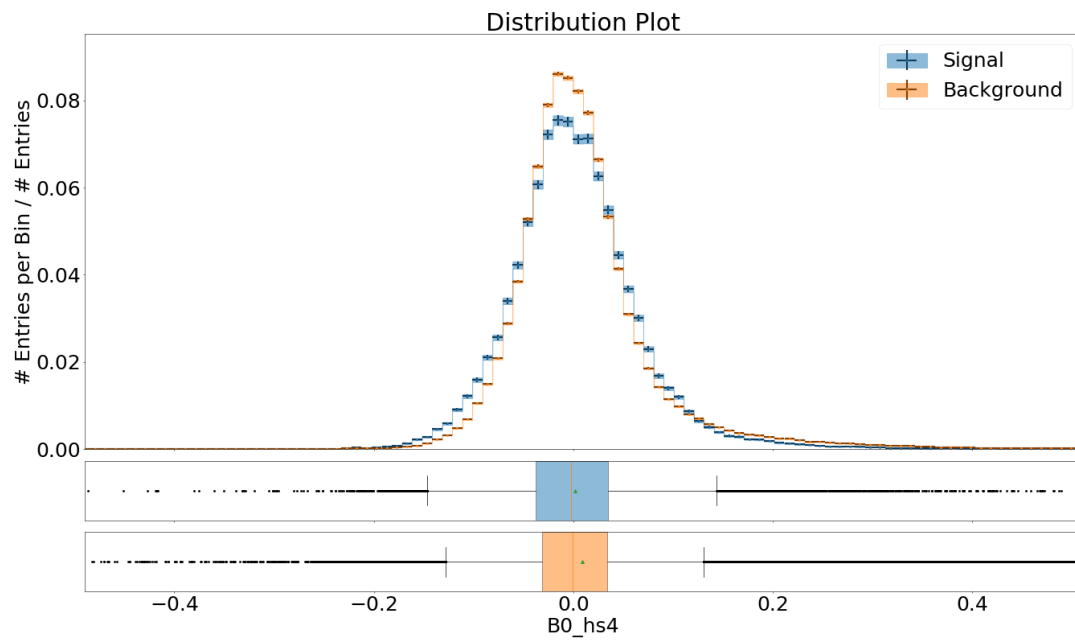
## 2.15 B0\_cc6



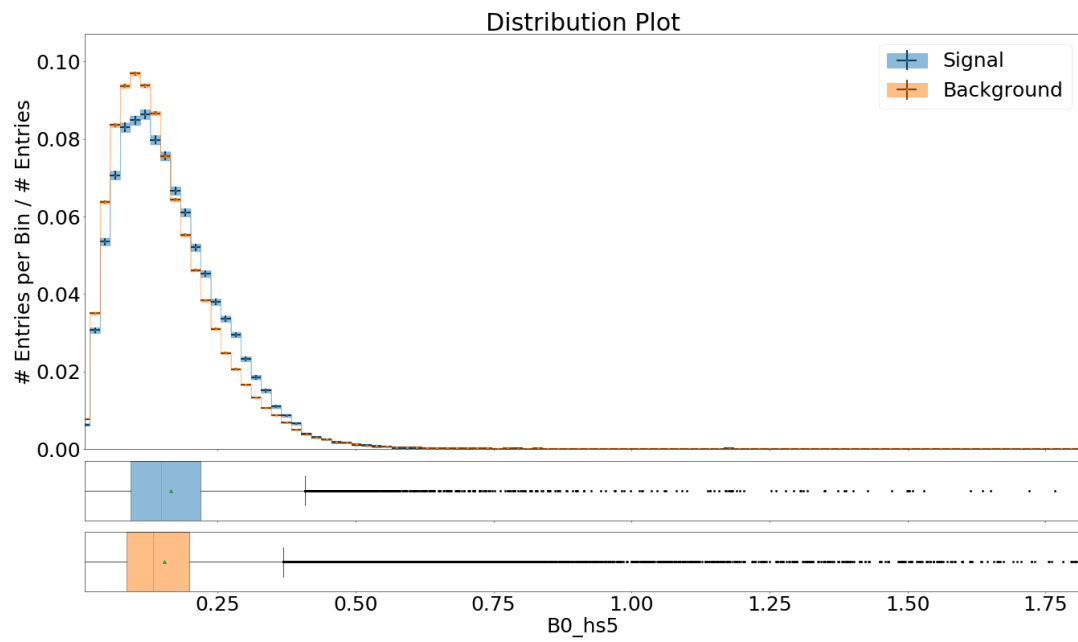
## 2.16 B0\_cc5



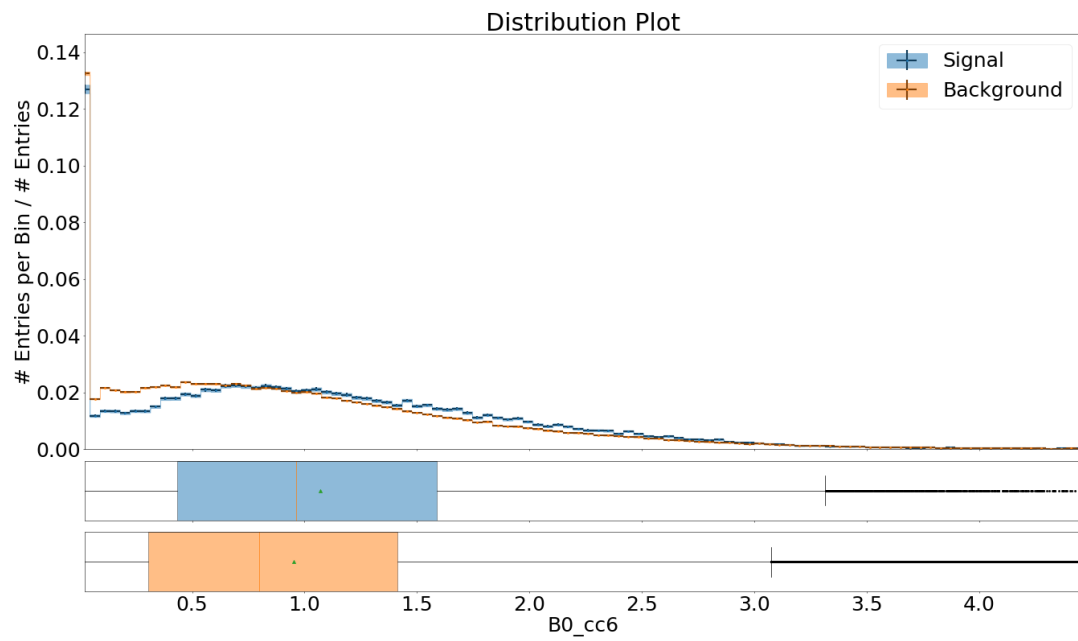
## 2.17 B0\_hso24



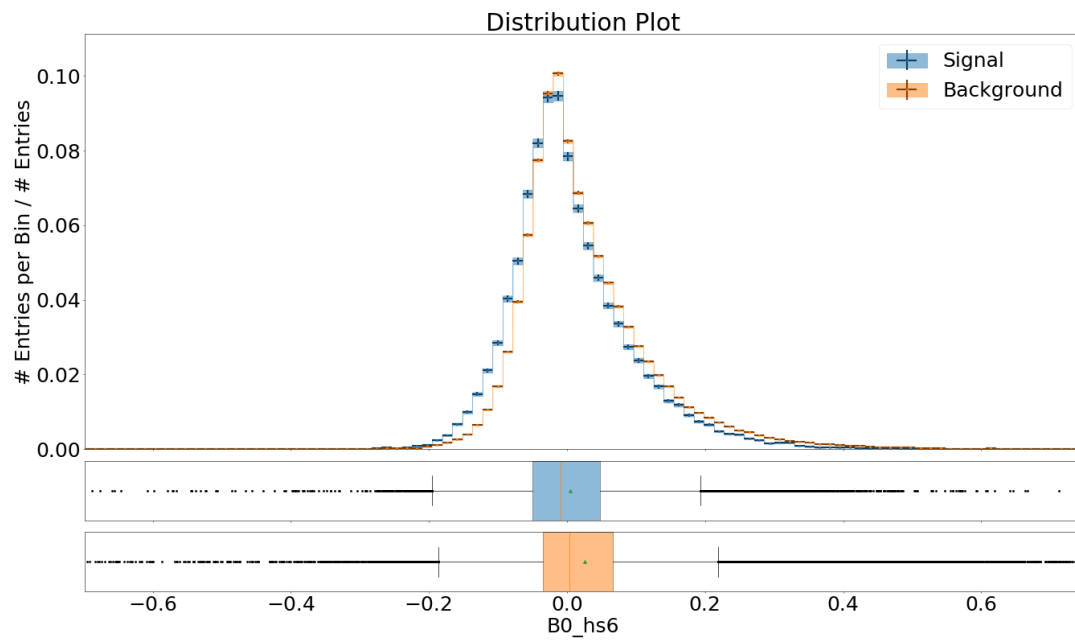
## 2.18 B0\_hso20



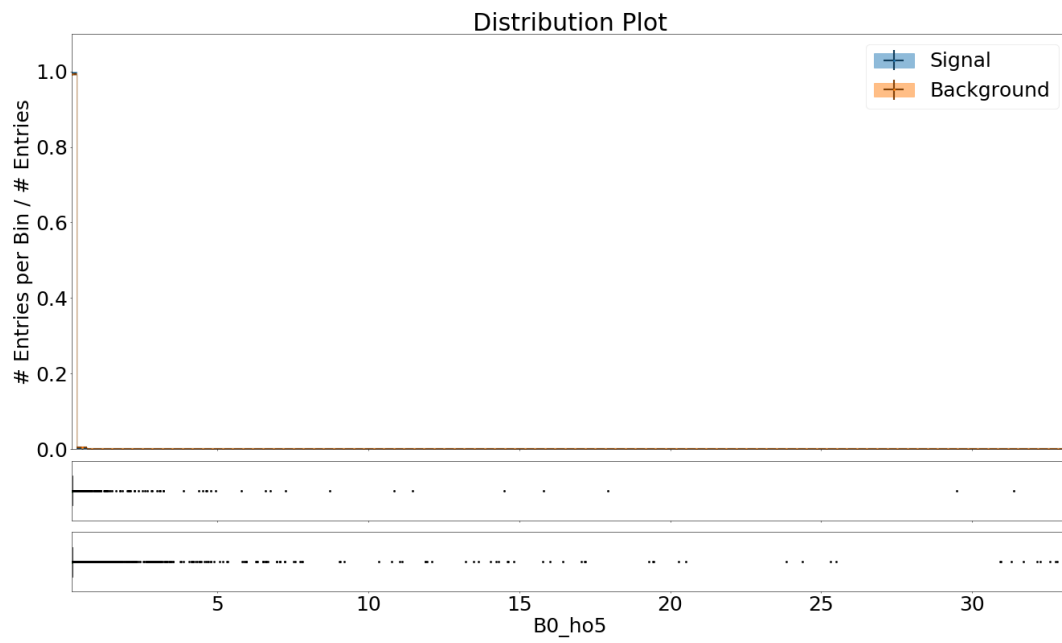
## 2.19 B0\_cc3



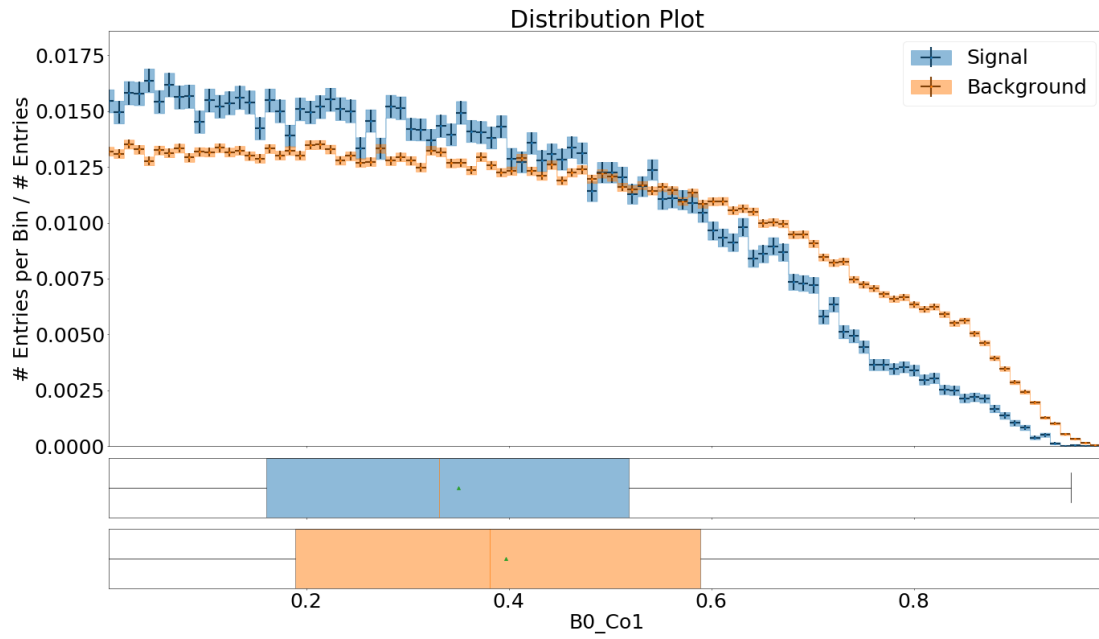
## 2.20 B0\_hso22



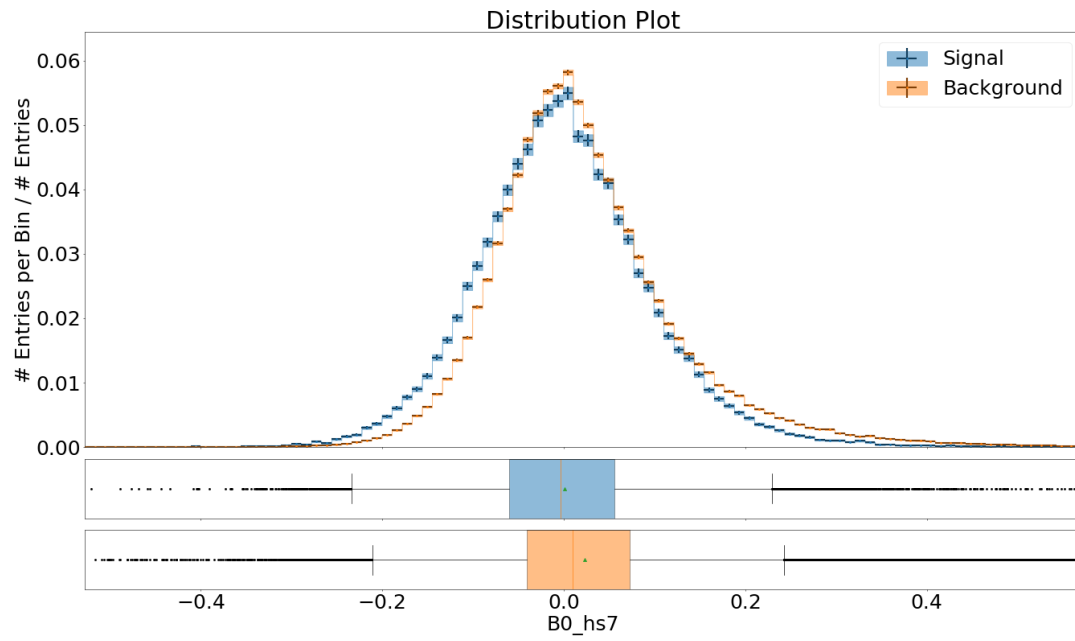
## 2.21 B0\_hoo0



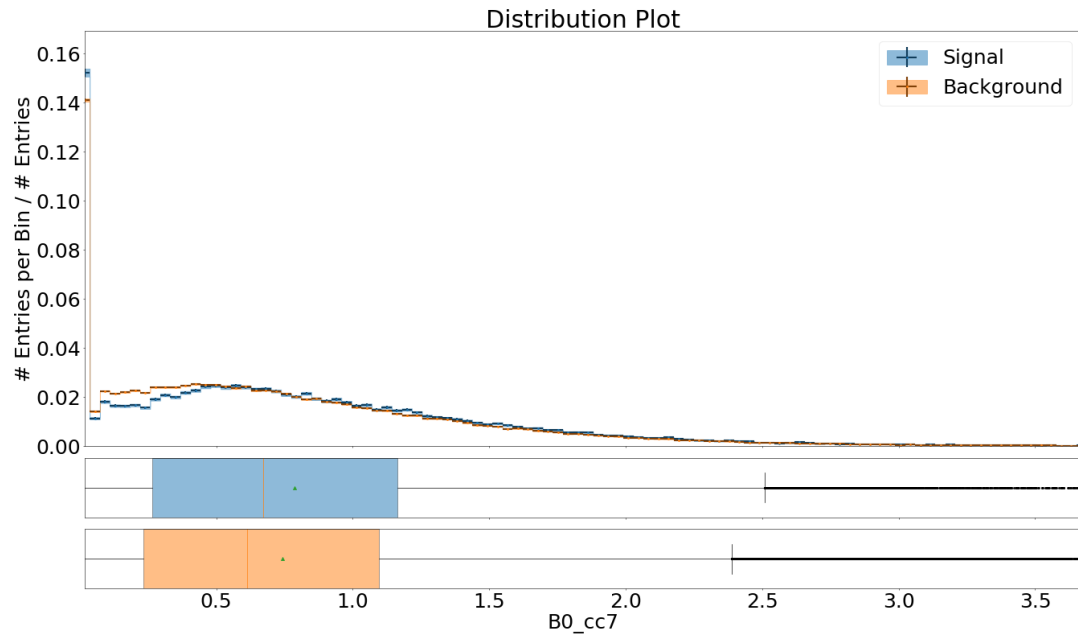
## 2.22 B0\_CosTBz



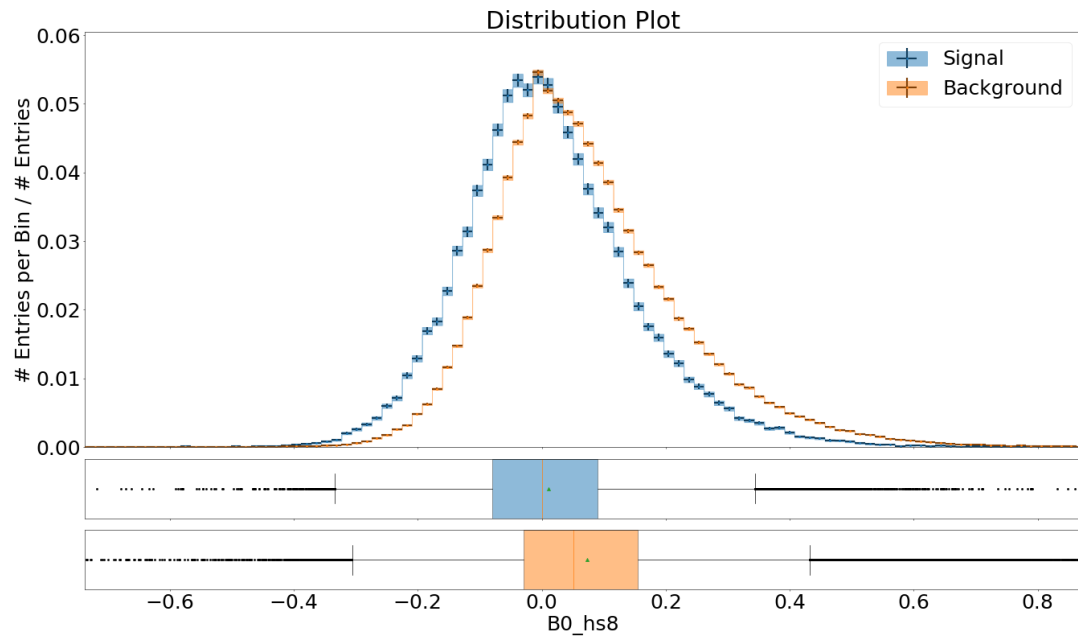
## 2.23 B0\_hso04



## 2.24 B0\_cc4

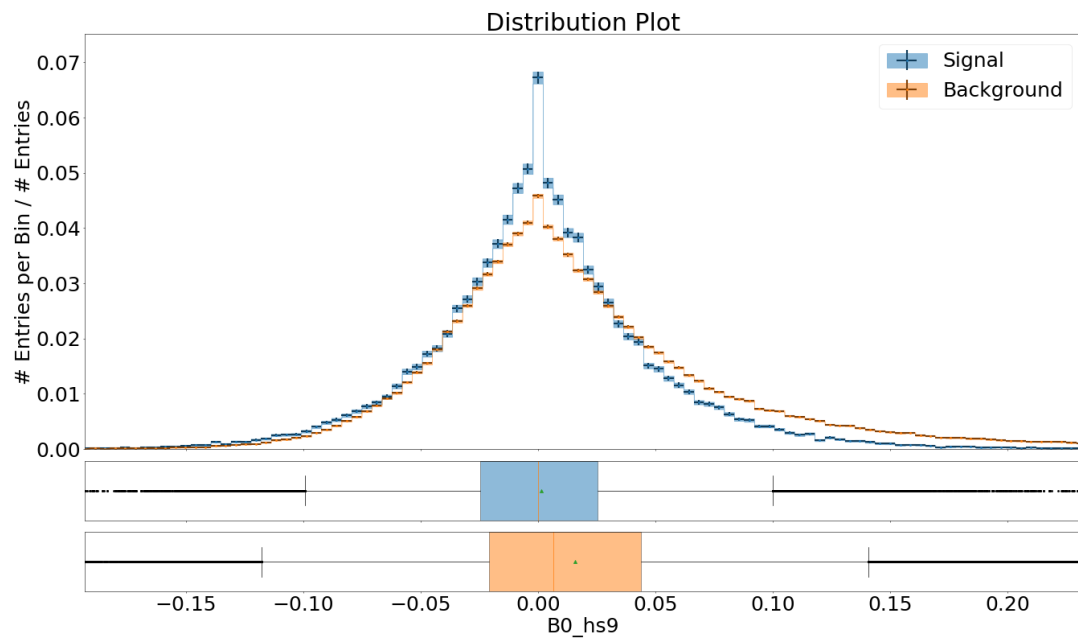


## 2.25 B0\_hso2

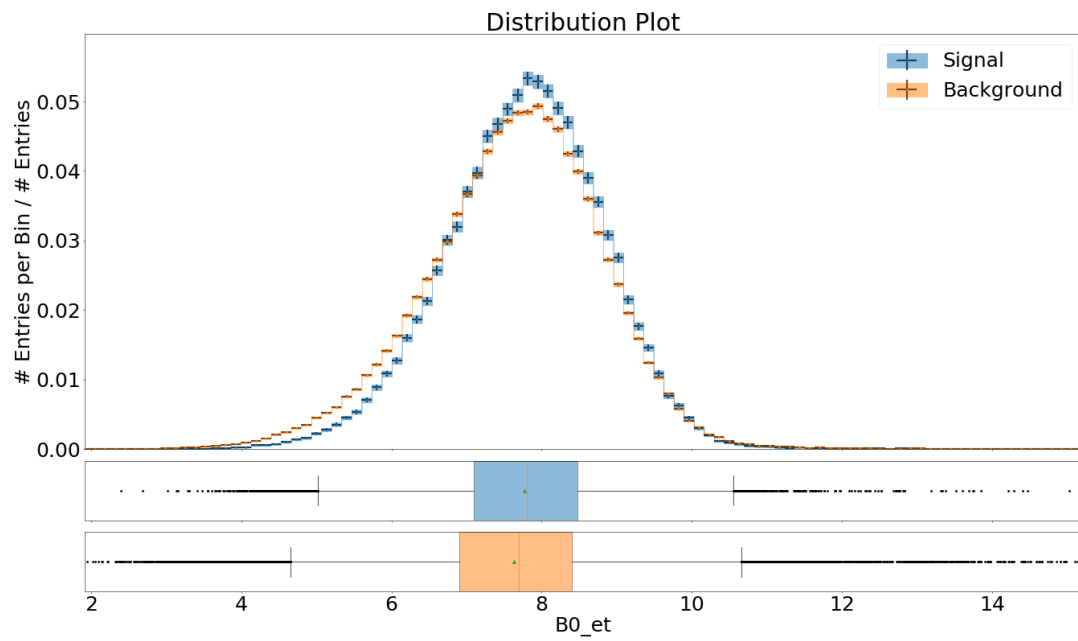




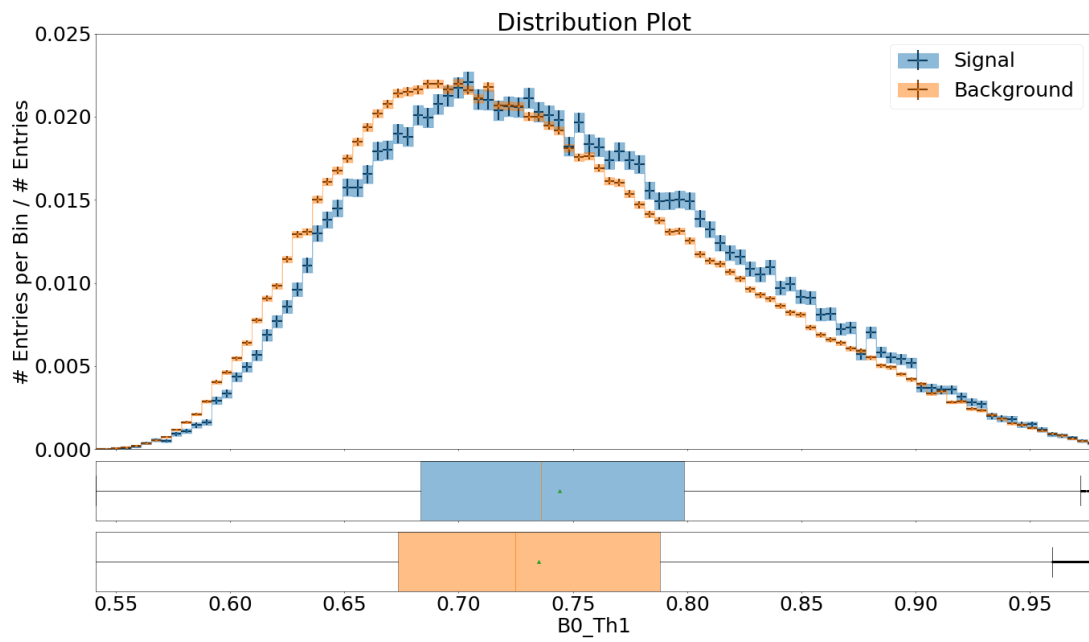
## 2.26 B0\_hso14



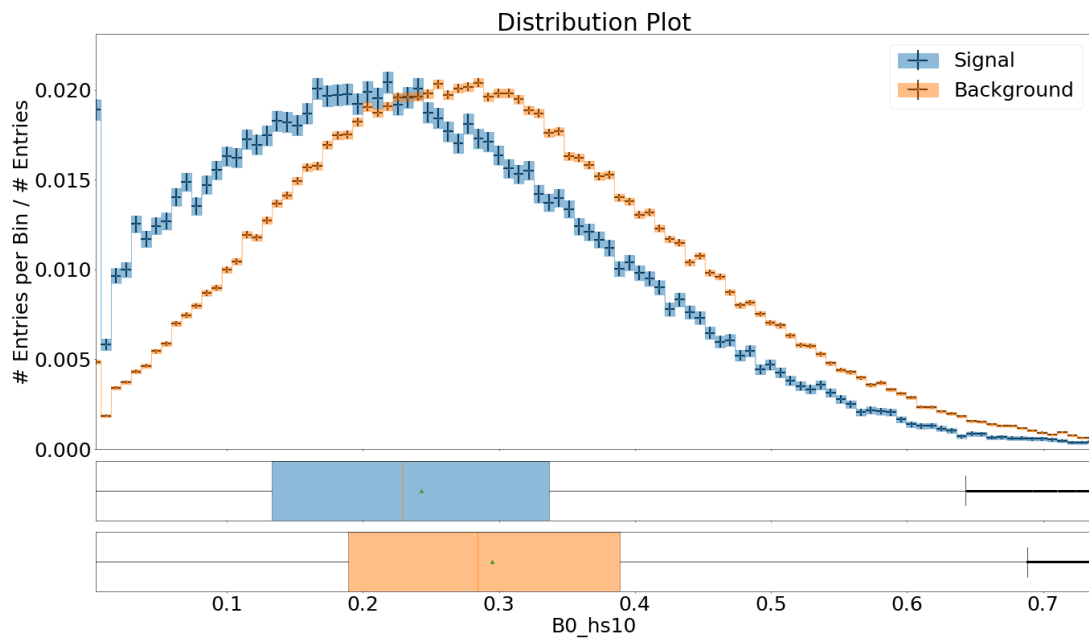
## 2.27 B0\_et



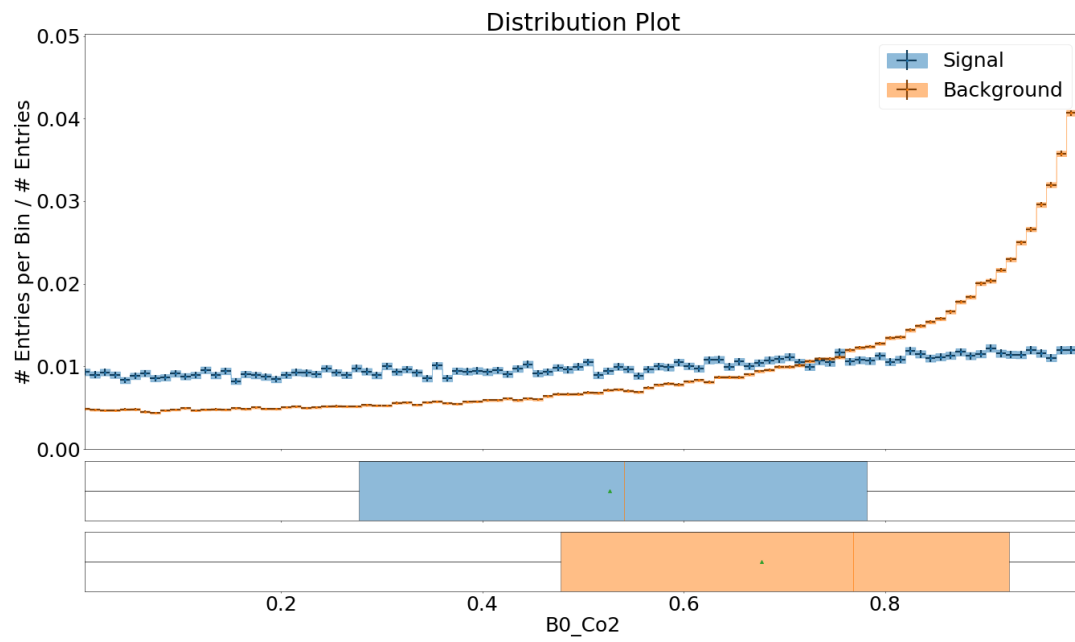
## 2.28 B0\_ThrustO



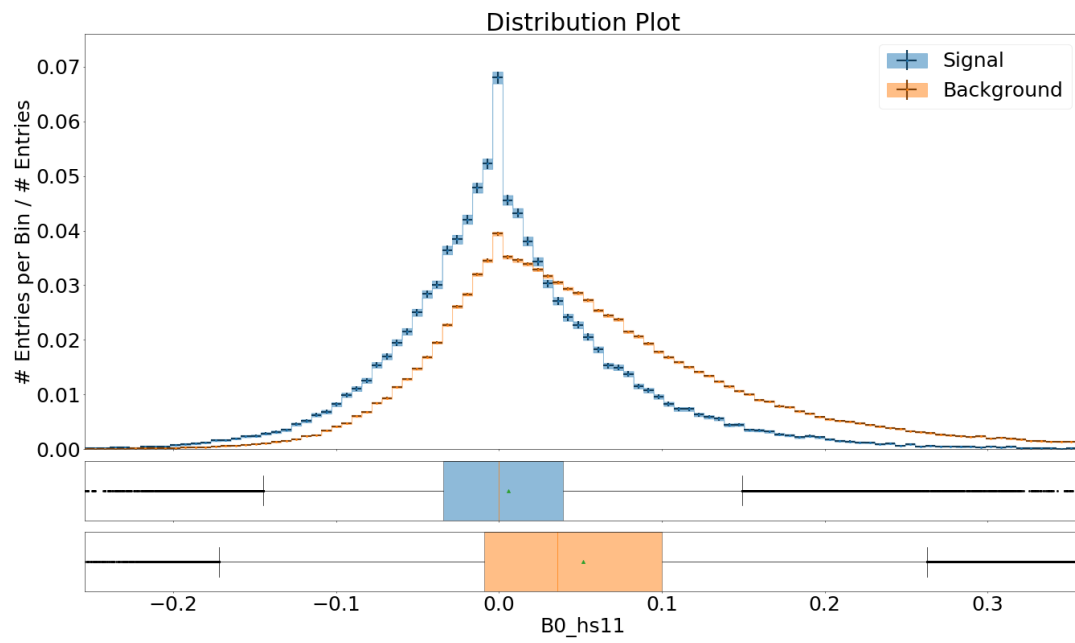
## 2.29 B0\_hso10



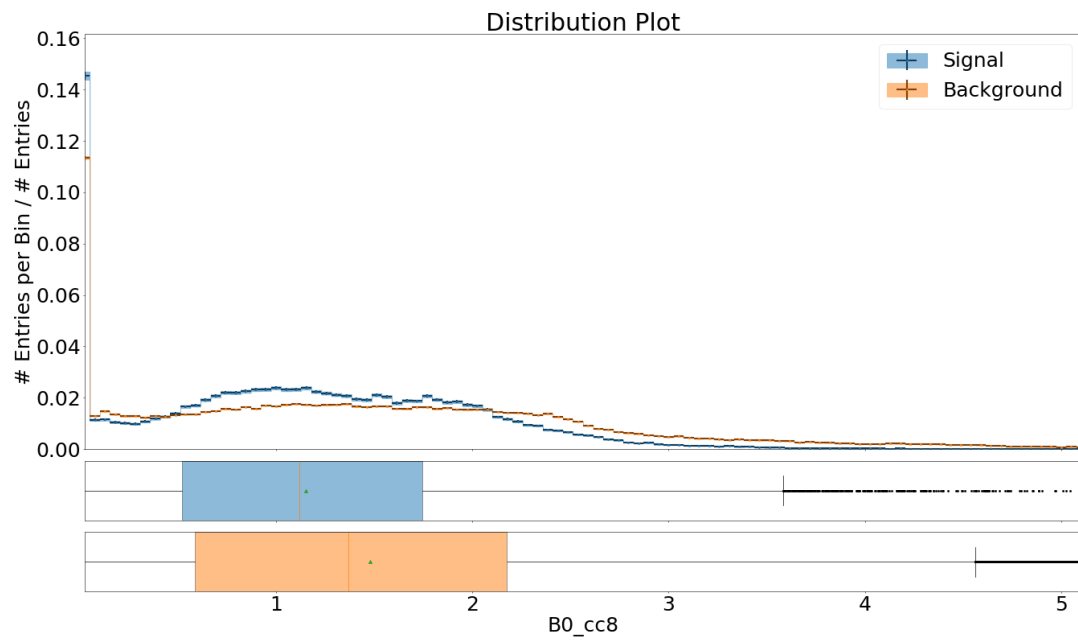
### 2.30 B0\_CosTBTO



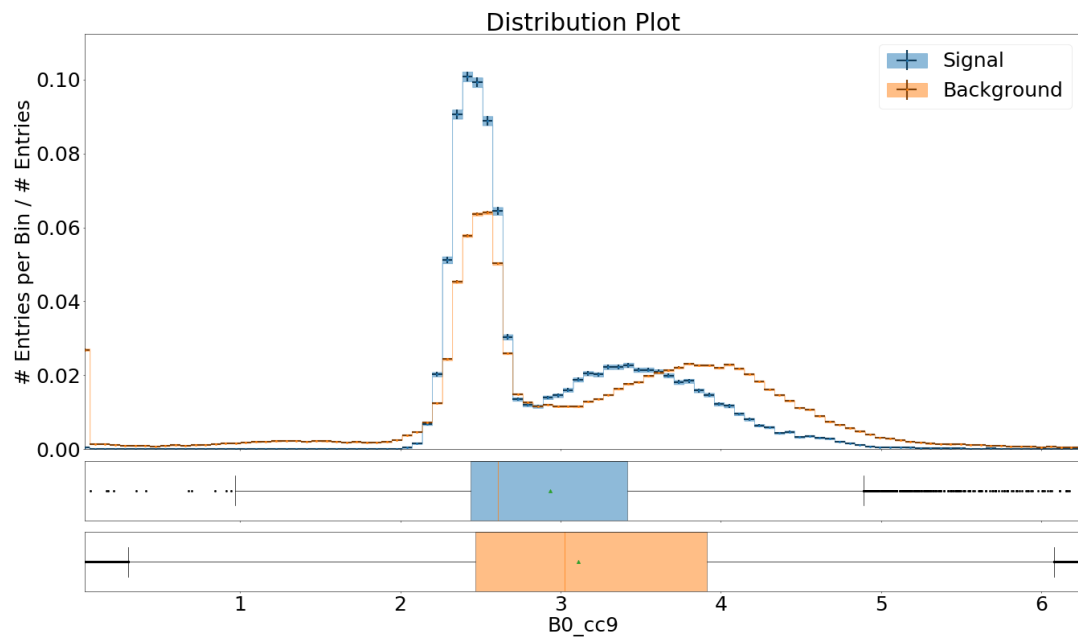
### 2.31 B0\_hso12



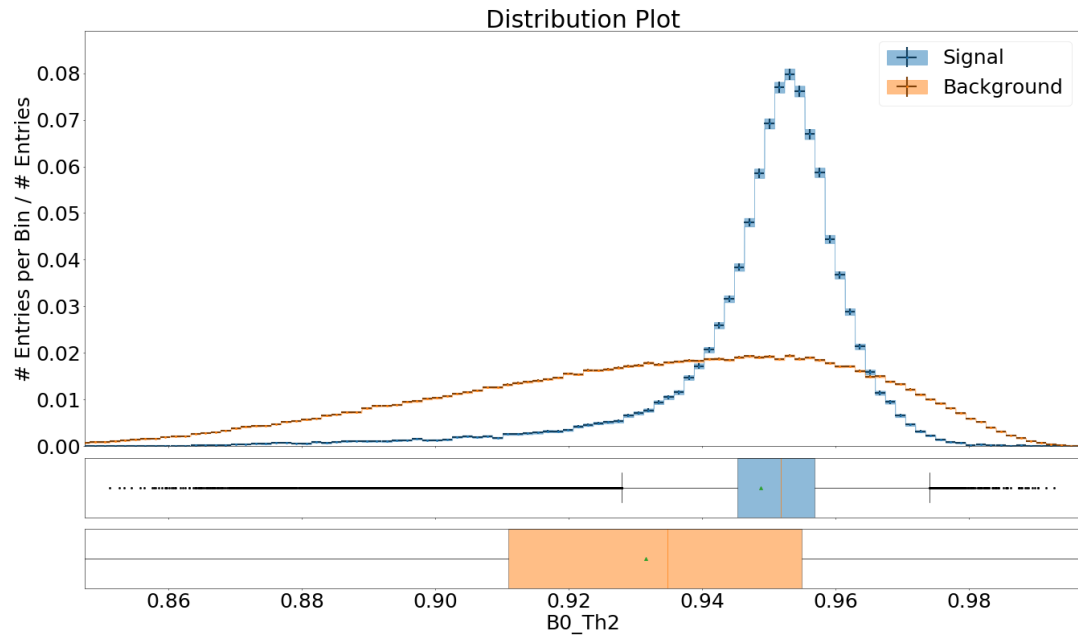
### 2.32 B0\_cc2



### 2.33 B0\_cc1



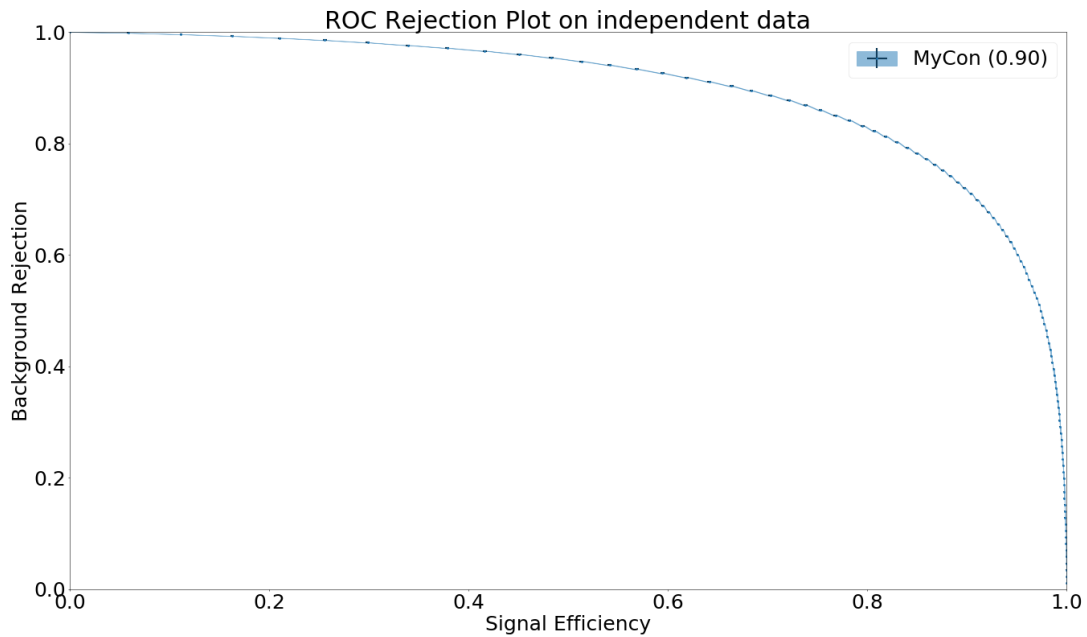
## 2.34 B0\_ThrustB

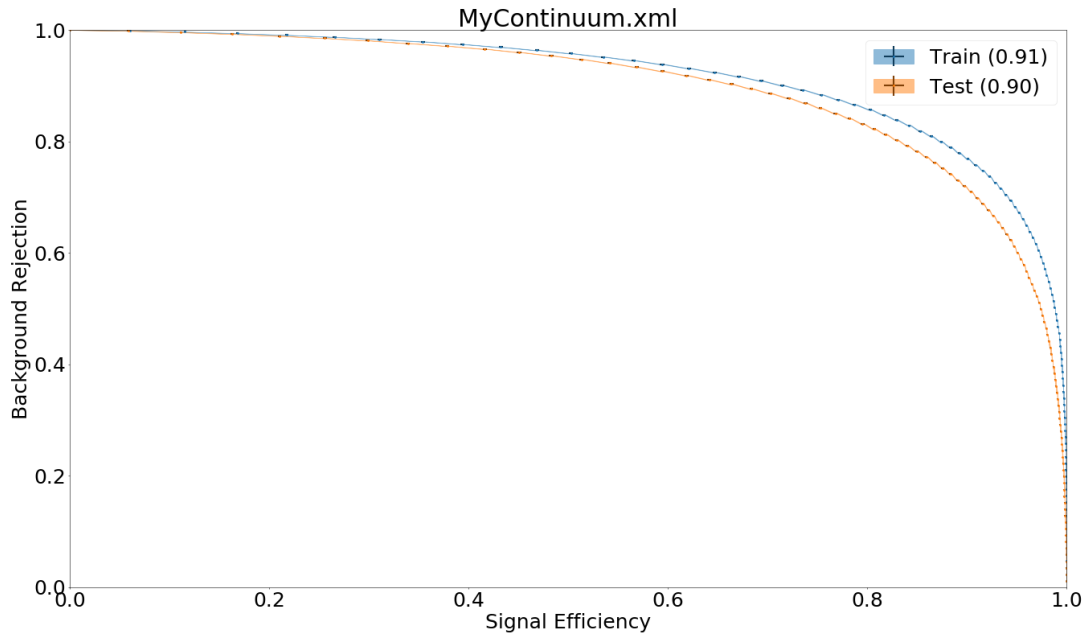


## 3 Classifier Plot

This section contains the receiver operating characteristics (ROC), purity projection, ...of the classifiers on training and independent data. The legend of each plot contains the shortened identifier and the area under the ROC curve in parenthesis.

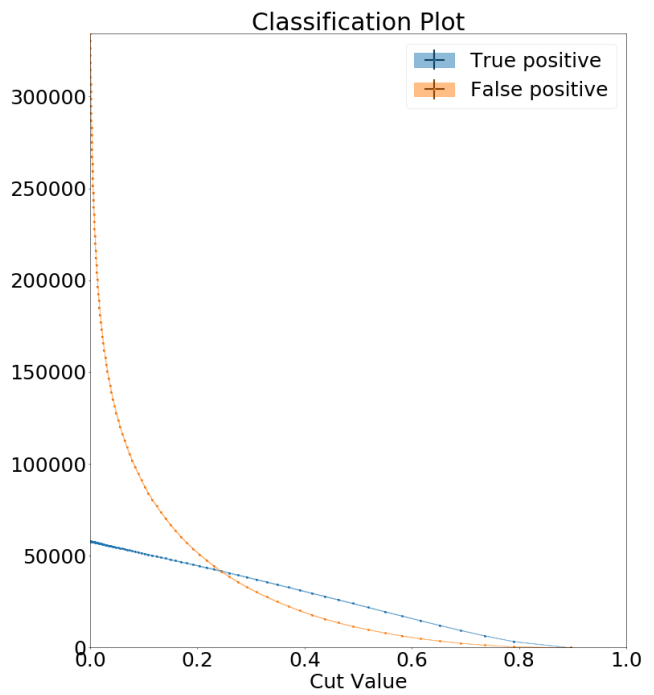
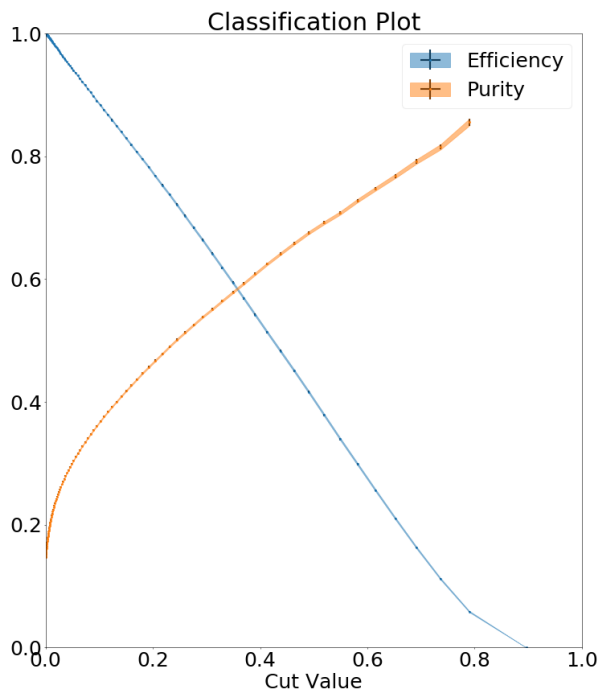
## 4 ROC Plot





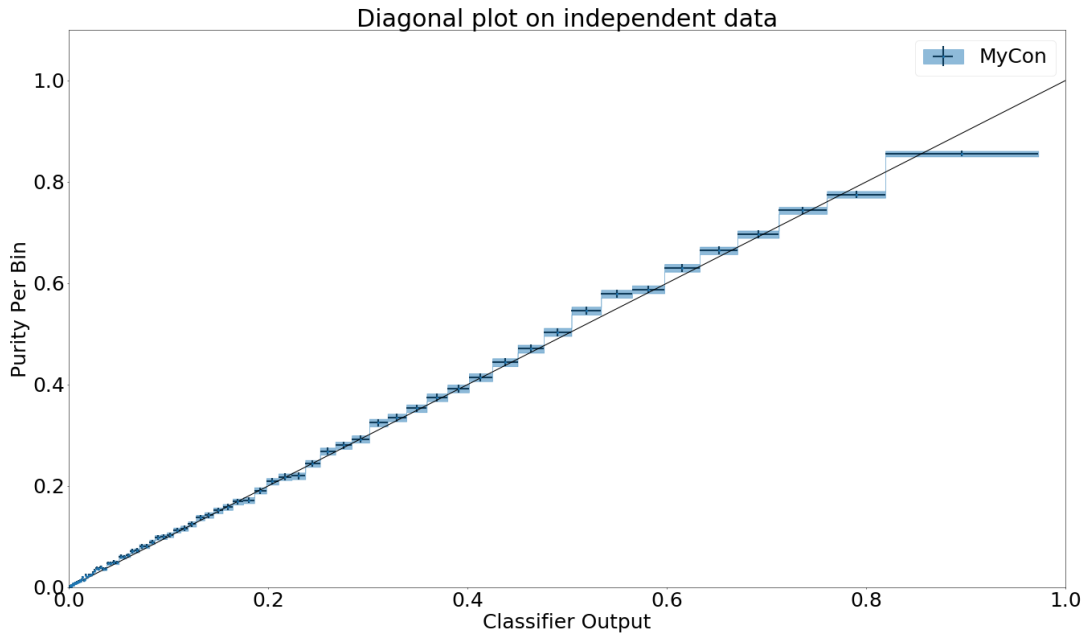
## 5 Classification Results

### 5.1 MyCon

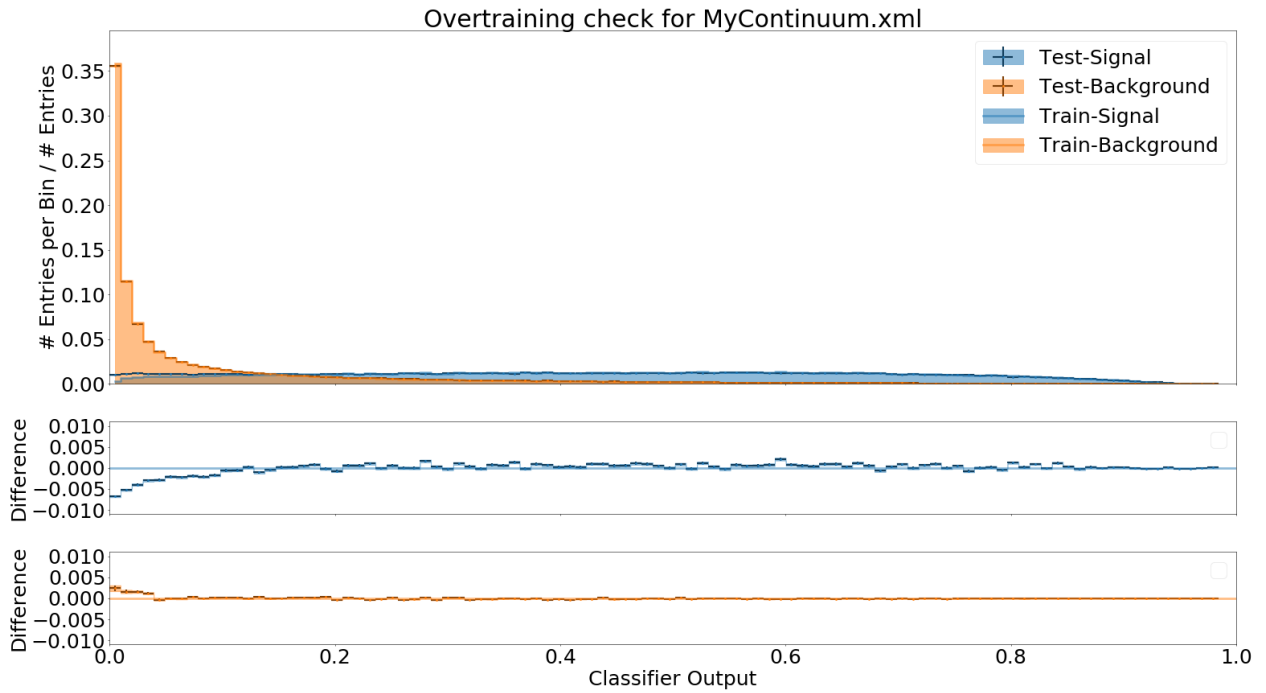


## 6 Diagonal Plot

### 6.1 MyCon



### 6.2 Overtraining Plot



## 7 Spectators

This section contains the distribution and dependence on the classifier outputs of all spectator variables.

Table 3: Abbreviations of spectators

Spectator	Abbreviation
-----------	--------------