# Study on Pythia Events in Different Magnetic Fields Using BDTs

$$\gamma\, p \rightarrow p\, \eta\, \pi^{+}\, \pi^{-}$$

**(08/22/2014)**

# # of Events for the three Currents

**Exclusive**

| Run # | Field (A) | EM | # Pythia Events | # Correct Thrown* | # Signal events | Background Combos | Accepted * (%) |
|---|---|---|---|---|---|---|---|
| 9007 | 1200 | 1.1 | 10M | 83329 | 7481 | 5.7M | 22.8 |
| 9008 | 1200 | 5.5 | 10M | 82767 | 6603 | 5.1M | 20.3 |
| 9001 | 1350 | 1.1 | 10M | 82937 | 7313 | 3.8M | 22.3 |
| 9002 | 1350 | 5.5 | 8.5M | 74383 | 5685 | 3.2M | 19.4 |
| 9004 | 1500 | 1.1 | 10M | 83100 | 6993 | 4.3M | 21.4 |
| 9005 | 1500 | 5.5 | 10M | 82767 | 6341 | 4.0M | 19.5 |

(*) The number of correct thrown is for the total $\gamma p \rightarrow p \eta \pi^+ \pi^-$ reaction where the percent accepted is only for the $\eta \rightarrow \gamma \gamma$ mode (which is the one that the report refers to).

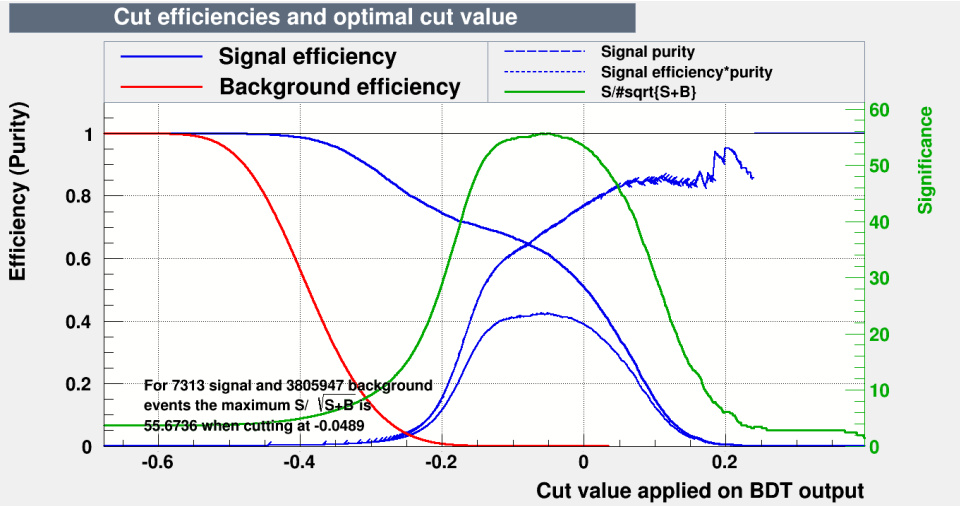
# % of Thrown events passing BDT cut for 0.8 purity

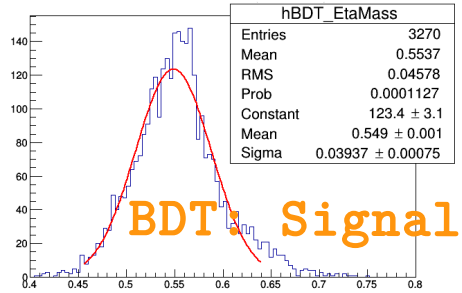
Exclusive

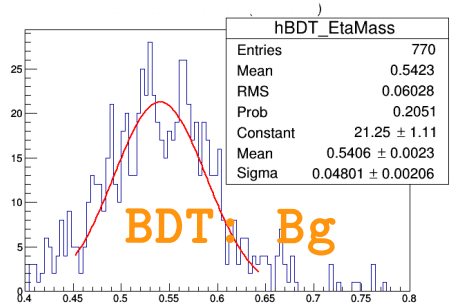
| Run # | Field (A) | EM | Events passing BDT cut for 0.8 purity | | % of Thrown events passing BDT cut for 0.8 purity | |
|---|---|---|---|---|---|---|
| | | | Signal | Bg | %Signal | %Bg |
| 9007 | 1200 | 1.1 | 1742 | 437 | 5.3 | 1.3 |
| 9008 | 1200 | 5.5 | 986 | 225 | 3.0 | 0.7 |
| 9001 | 1350 | 1.1 | 3270 | 770 | 10.0 | 2.4 |
| 9002 | 1350 | 5.5 | 2097 | 545 | 7.2 | 1.9 |
| 9004 | 1500 | 1.1 | 1998 | 433 | 6.1 | 1.3 |
| 9005 | 1500 | 5.5 | 1949 | 519 | 6.0 | 1.6 |

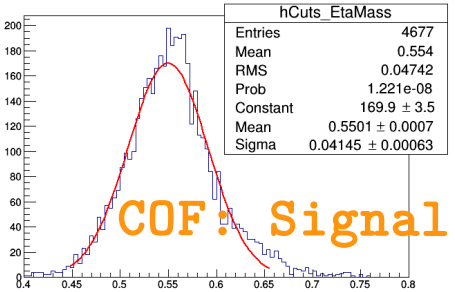
# Comparison between BDT Cut with 0.8 purity and 1% KinFit Conf Level Cut

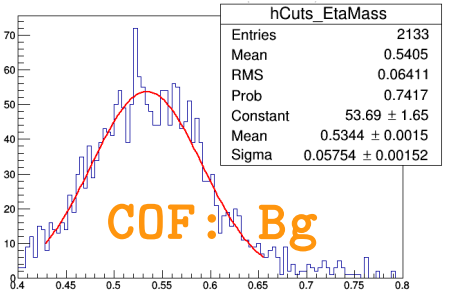
## Exclusive 9001



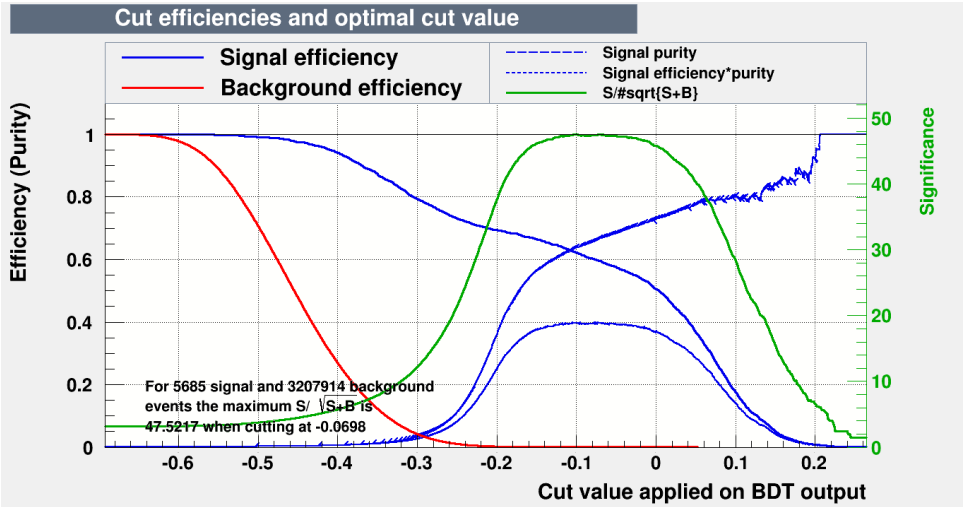



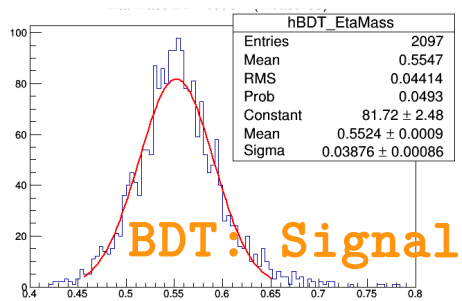



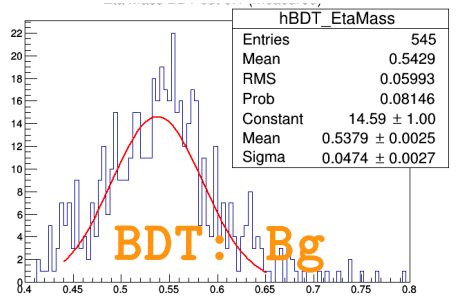



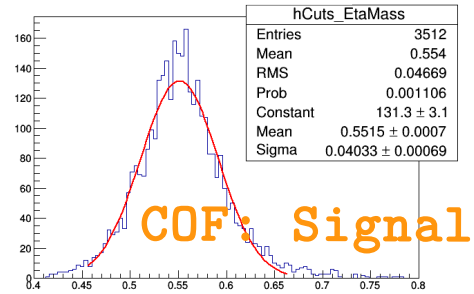



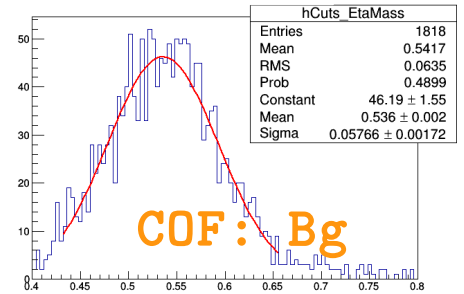

## Exclusive 9002



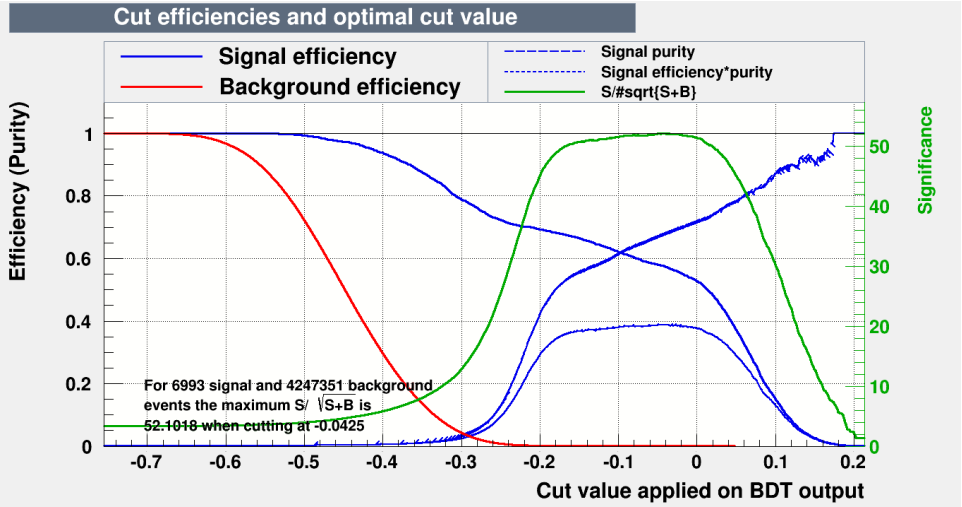



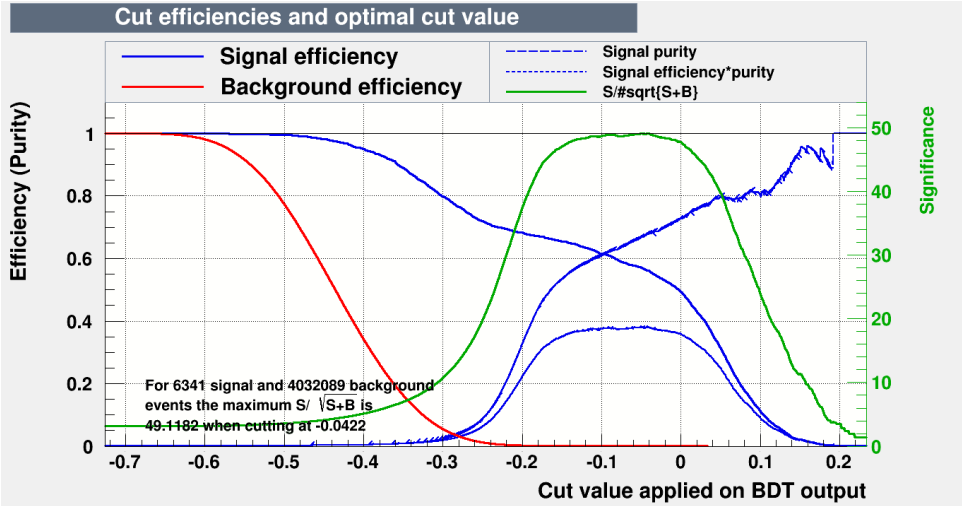



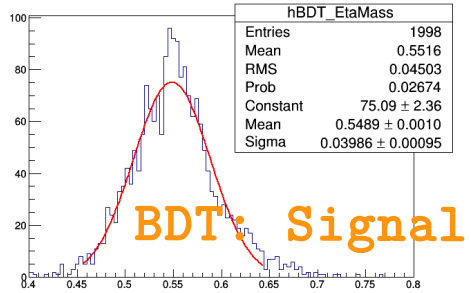
# Comparison between BDT Cut with 0.8 purity and 1% KinFit Conf Level Cut

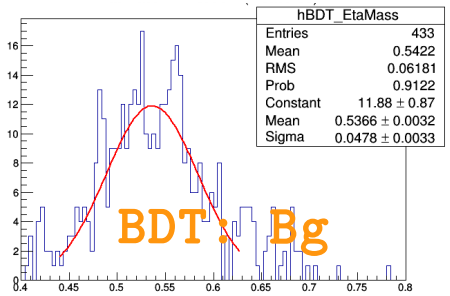
## Exclusive 9004

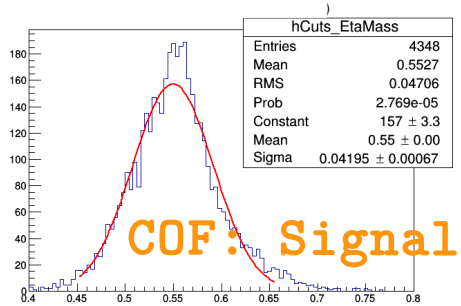


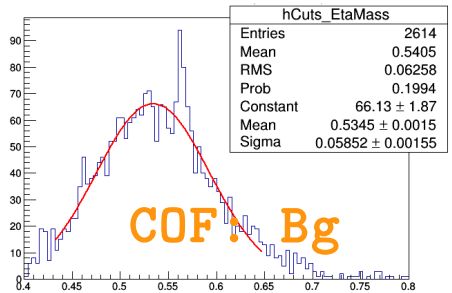

## Exclusive 9005

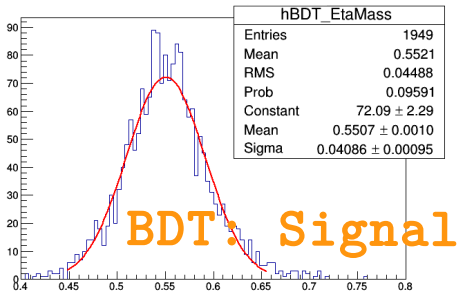


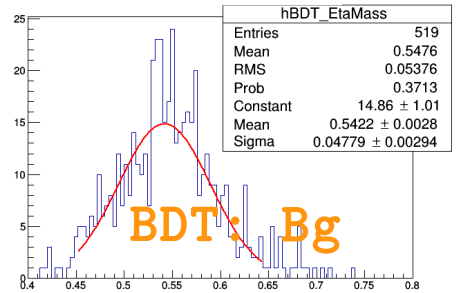



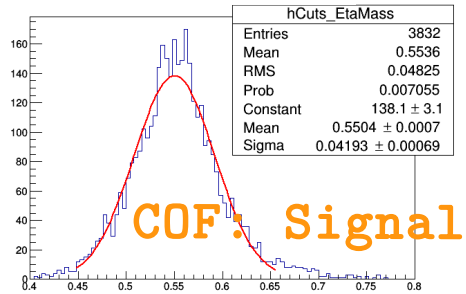



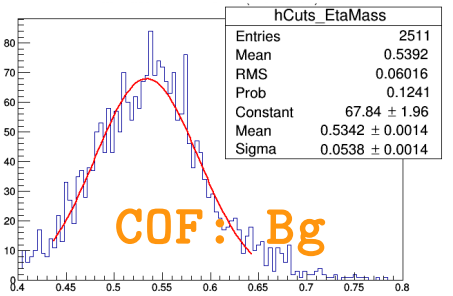



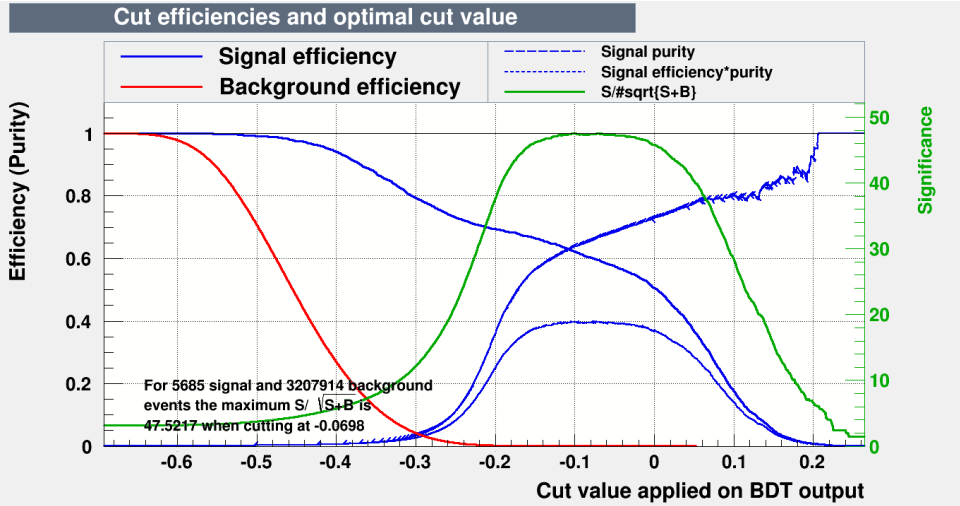



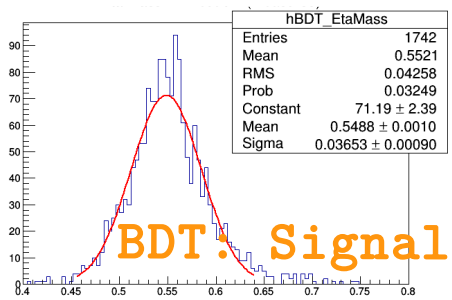



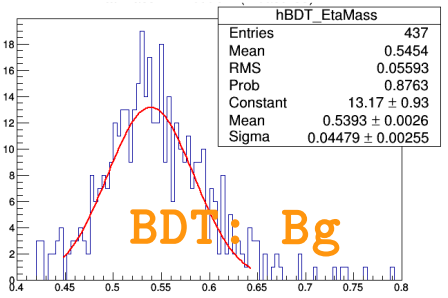



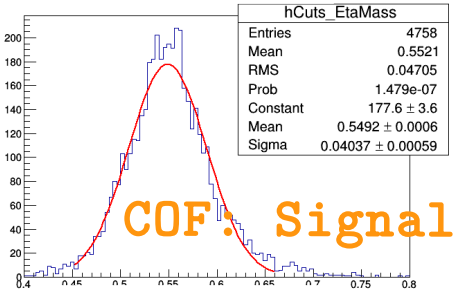
# Comparison between BDT Cut with 0.8 purity and 1% KinFit Conf Level Cut

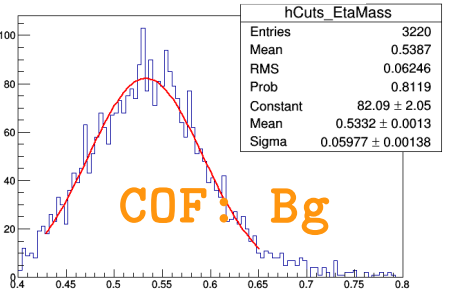
## Exclusive 9007




## Exclusive 9008