The LaTeX report

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Contents

1 Setup

1.1 Command history

```
ma5>define invisible = 12 14 16 -12 -14 -16
ma5>set main.fastsim.package = fastjet
ma5>set main.fastsim.algorithm = antikt
ma5>set main.fastsim.radius = 0.4
ma5>set main.fastsim.ptmin = 5.0
ma5>set main.fastsim.bjet_id.matching_dr = 0.4
ma5>set main.fastsim.bjet_id.efficiency = 1.0
ma5>set main.fastsim.bjet_id.misid_cjet = 0.0
ma5>set main.fastsim.bjet_id.misid_ljet = 0.0
ma5>set main.fastsim.tau_id.efficiency = 1.0
ma5>set main.fastsim.tau_id.misid_ljet = 0.0
ma5>import /home/s1412595/Desktop/SummerProject2019/MG5_aMC_v2_6_6/BP2_080719/Events/-
run_01/tag_1_pythia8_events.hepmc.gz as reco_events
ma5>set main.outputfile=tag_1_pythia8_BasicReco.lhe.gz
ma5>submit /home/s1412595/Desktop/SummerProject2019/MG5_aMC_v2_6_6/BP2_080719/MA5_HADRON_ANALYSIS_
ma5>remove reco_events
ma5>set main.mode = parton
ma5>import /home/s1412595/Desktop/SummerProject2019/MG5_aMC_v2_6_6/BP2_080719/Events/-
run_01/tag_1_pythia8_BasicReco.lhe.gz as tag_1_pythia8_BasicReco
ma5>set main.stacking_method = normalize2one
ma5>define e = e+ e-
ma5>define mu = mu+ mu-
ma5>select (j) PT > 20
ma5>select (b) PT > 20
ma5>select (e) PT > 10
ma5>select (mu) PT > 10
ma5>select (j) ABSETA < 2.5
ma5>select (b) ABSETA < 2.5
ma5>select (e) ABSETA < 2.5
ma5>select (mu) ABSETA < 2.5
ma5>plot MET 40 0 500
ma5>plot THT 40 0 500
ma5>plot PT(j[1]) 40 0 500 [logY]
ma5>plot ETA(j[1]) 40 -10 10 [logY]
ma5>plot MT_MET(j[1]) 40 0 500 [logY]
ma5>plot PT(j[2]) 40 0 500 [logY]
ma5>plot ETA(j[2]) 40 -10 10 [logY]
ma5>plot MT_MET(j[2]) 40 0 500 [logY]
ma5>plot PT(e[1]) 40 0 500 [logY]
ma5>plot ETA(e[1]) 40 -10 10 [logY]
ma5>plot MT_MET(e[1]) 40 0 500 [logY]
ma5>plot PT(mu[1]) 40 0 500 [logY]
ma5>plot ETA(mu[1]) 40 -10 10 [logY]
ma5>plot MT_MET(mu[1]) 40 0 500 [logY]
ma5>plot M(e[1] mu[1]) 40 0 500 [logY]
ma5>plot M(j[1] e[1]) 40 0 500 [logY]
```

```
ma5>plot M(j[1] j[2]) 40 0 500 [logY]
ma5>plot M(j[1] mu[1]) 40 0 500 [logY]
ma5>plot M(j[2] e[1]) 40 0 500 [logY]
ma5>plot M(j[2] mu[1]) 40 0 500 [logY]
ma5>plot DELTAR(e[1],mu[1]) 40 0 10 [logY]
ma5>plot DELTAR(j[1],e[1]) 40 0 10 [logY]
ma5>plot DELTAR(j[1],j[2]) 40 0 10 [logY]
ma5>plot DELTAR(j[1],mu[1]) 40 0 10 [logY]
ma5>plot DELTAR(j[2],e[1]) 40 0 10 [logY]
ma5>plot DELTAR(j[2],mu[1]) 40 0 10 [logY]
ma5>submit /home/s1412595/Desktop/SummerProject2019/MG5_aMC_v2_6_6/BP2_080719/MA5_HADRON_ANALYSIS_
```

1.2 Configuration

- MadAnalysis version 1.8.5 (2019/04/04).
- Histograms given for an integrated luminosity of 10fb^{-1}.

2 Datasets

2.1 tag_1_pythia8_basicreco

- Sample consisting of: signal events.
- Generated events: 1000 events.
- Normalization to the luminosity: 0+/- 0 events.
- Ratio (event weight): 0.0 .

Path to the event file	Nr. of events	Cross section (pb)	Negative wgts (%)
Events/run_01/-tag_1_pythia8_BasicReco.lhe.gz	1000	0.0 @ 0.0%	0.0

3 Histos and cuts

3.1 Object definition 1

*** Cut: select (j) PT > 20.0**

3.2 Object definition 2

*** Cut: select (b) PT > 20.0**

3.3 Object definition 3

*** Cut: select (e) PT > 10.0**

3.4 Object definition 4

*** Cut: select (mu) PT > 10.0**

3.5 Object definition 5

*** Cut: select (j) ABSETA < 2.5**

3.6 Object definition 6

*** Cut: select (b) ABSETA < 2.5**

3.7 Object definition 7

*** Cut: select (e) ABSETA < 2.5**

3.8 Object definition 8

*** Cut: select (mu) ABSETA < 2.5**

3.9 Histogram 1

*** Plot: MET**

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
tag_1_pythia8_	0.0 +/- 0.0	1.0	0.0	0.0	0.0	0.0

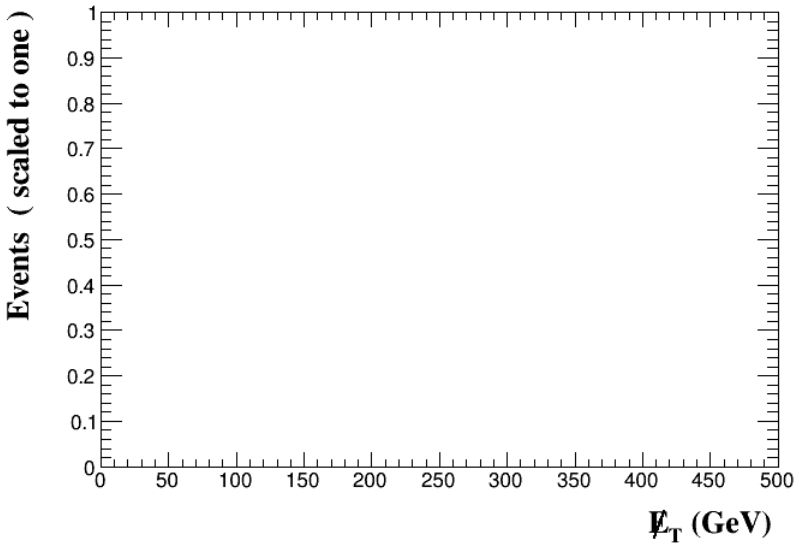
Events (scaled to one)
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
50
100
150
200
250
300
350
400
450
500
$\not{E}_T$ (GeV)

Figure 1.

3.10 Histogram 2

*** Plot: THT**

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
tag_1_pythia8_	0.0 +/- 0.0	1.0	0.0	0.0	0.0	0.0

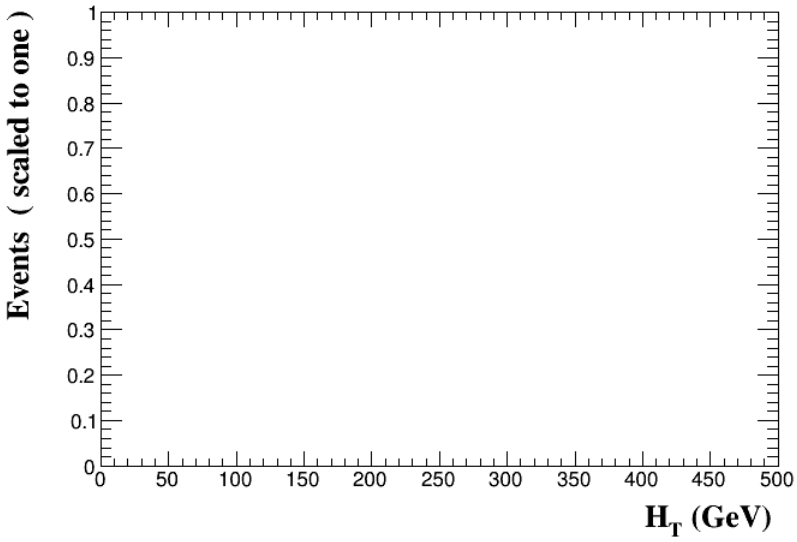

Figure 2.

3.11 Histogram 3

*** Plot: PT (j[1])**

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
tag_1_pythia8_	0.0 +/- 0.0	1.0	0.0	0.0	0.0	0.0

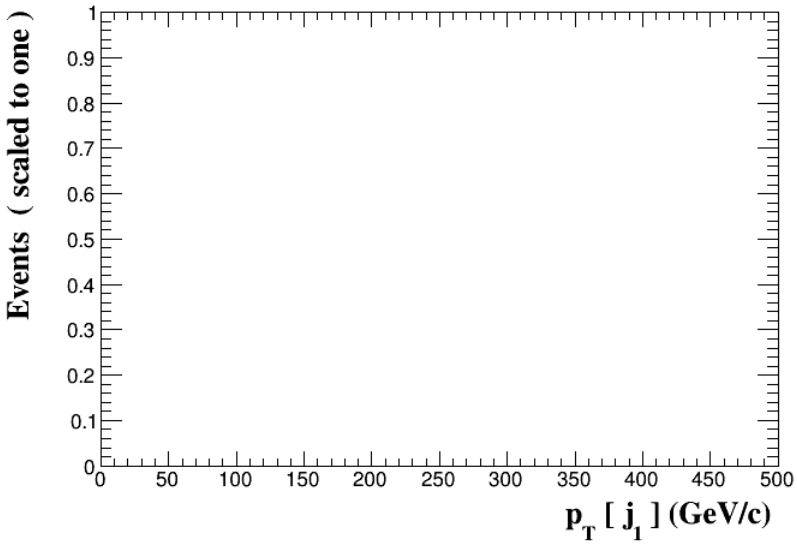

Figure 3.

3.12 Histogram 4

*** Plot: ETA (j[1])**

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
tag_1_pythia8_	0.0 +/- 0.0	1.0	0.0	0.0	0.0	0.0

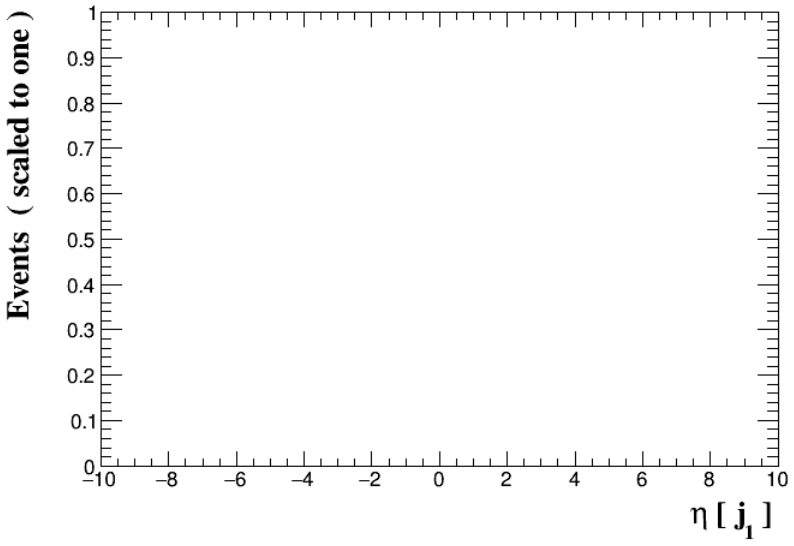

Figure 4.

3.13 Histogram 5

*** Plot: MT_MET (j[1])**

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
tag_1_pythia8_	0.0 +/- 0.0	1.0	0.0	0.0	0.0	0.0

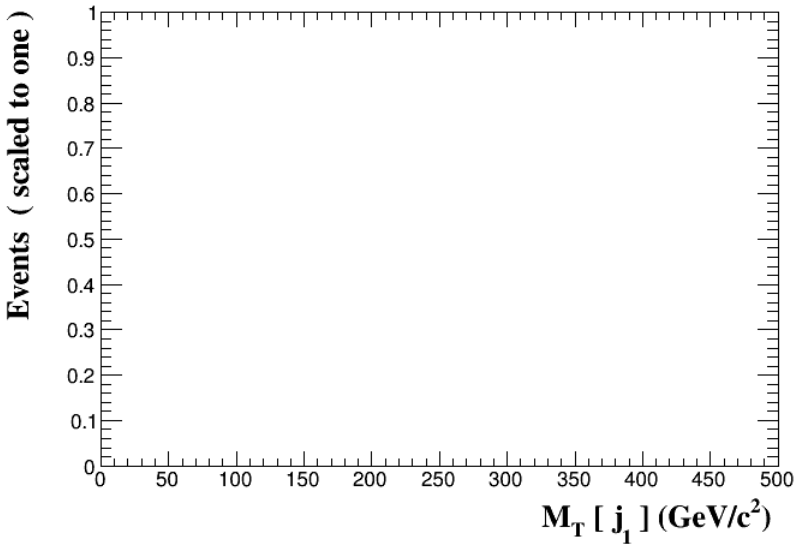

Figure 5.

3.14 Histogram 6

*** Plot: PT (j[2])**

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
tag_1_pythia8_	0.0 +/- 0.0	1.0	0.0	0.0	0.0	0.0

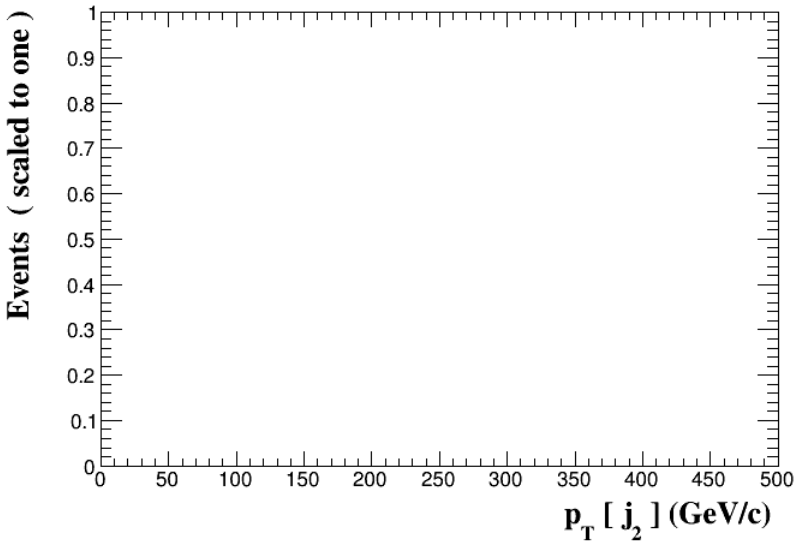

Figure 6.

3.15 Histogram 7

*** Plot: ETA (j[2])**

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
tag_1_pythia8_	0.0 +/- 0.0	1.0	0.0	0.0	0.0	0.0

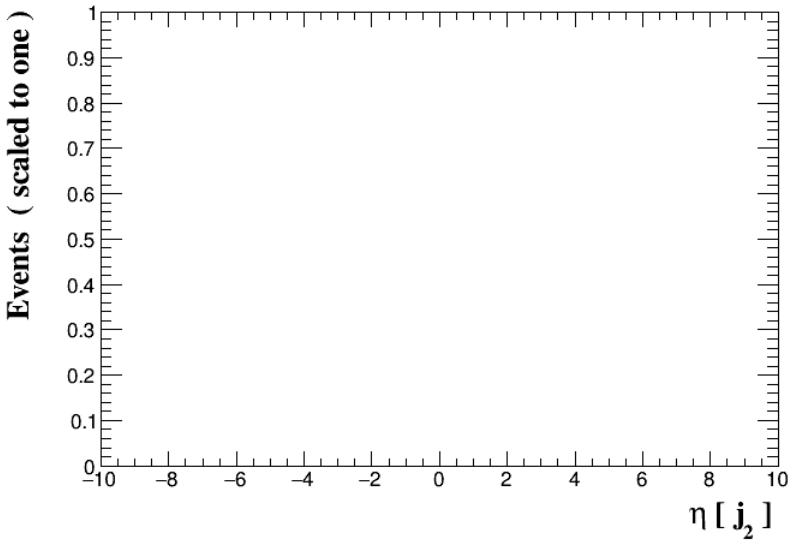

Figure 7.

3.16 Histogram 8

*** Plot: MT_MET (j[2])**

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
tag_1_pythia8_	0.0 +/- 0.0	1.0	0.0	0.0	0.0	0.0

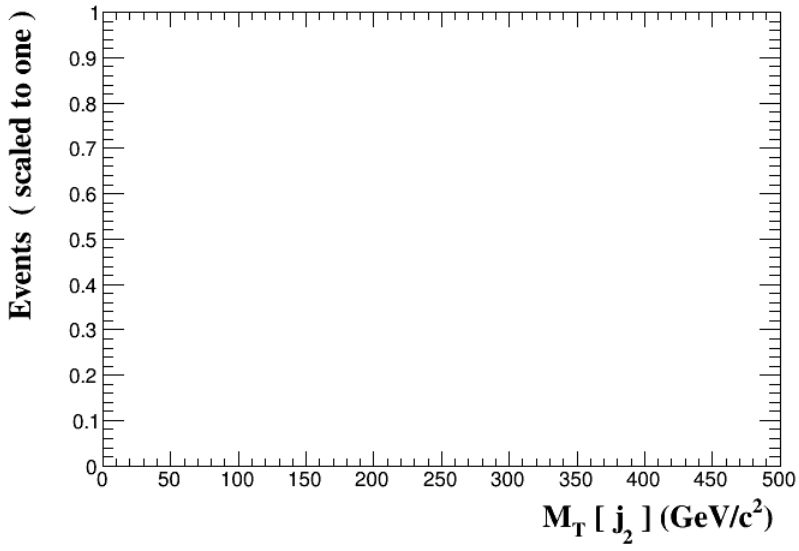

Figure 8.

3.17 Histogram 9

*** Plot: PT (e[1])**

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
tag_1_pythia8_	0.0 +/- 0.0	1.0	0.0	0.0	0.0	0.0

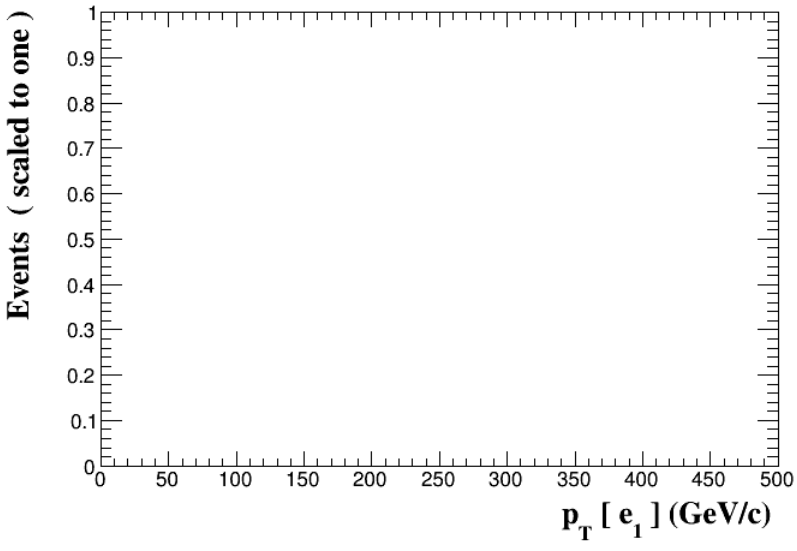

Figure 9.

3.18 Histogram 10

*** Plot: ETA (e[1])**

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
tag_1_pythia8_	0.0 +/- 0.0	1.0	0.0	0.0	0.0	0.0

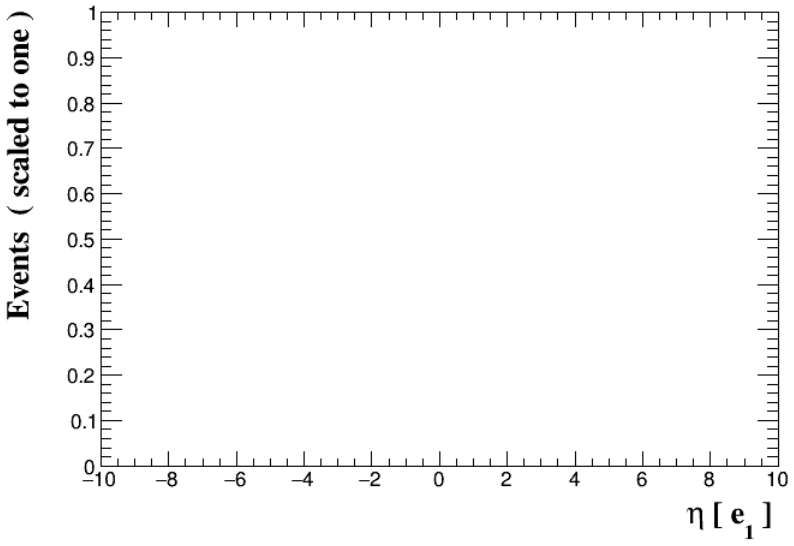

Figure 10.

3.19 Histogram 11

*** Plot: MT_MET (e[1])**

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
tag_1_pythia8_	0.0 +/- 0.0	1.0	0.0	0.0	0.0	0.0

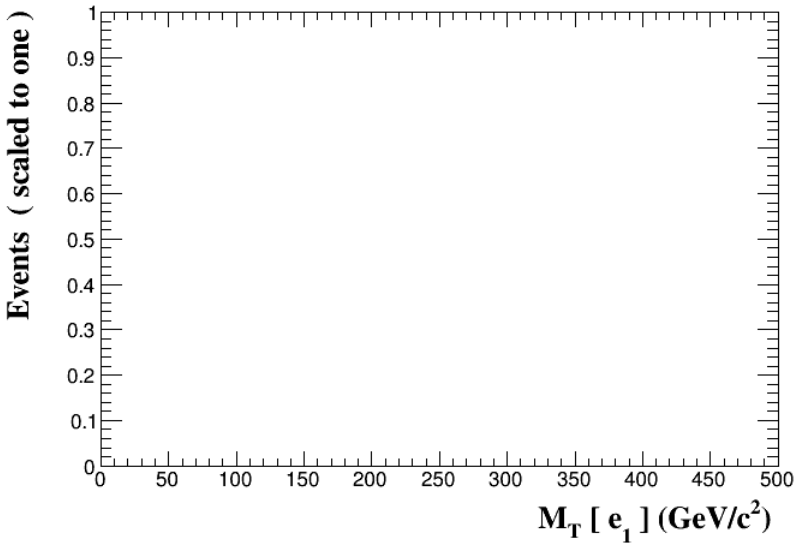

Figure 11.

3.20 Histogram 12

*** Plot: PT (mu[1])**

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
tag_1_pythia8_	0.0 +/- 0.0	1.0	0.0	0.0	0.0	0.0

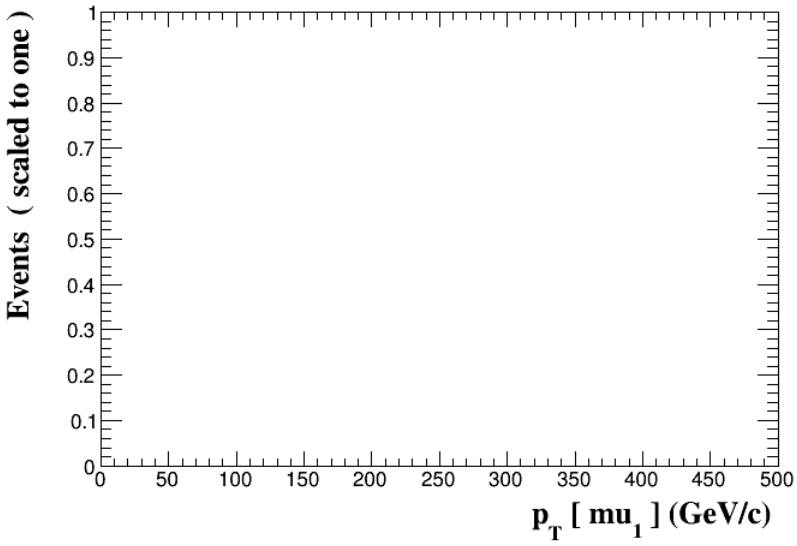

Figure 12.

3.21 Histogram 13

*** Plot: ETA (mu[1])**

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
tag_1_pythia8_	0.0 +/- 0.0	1.0	0.0	0.0	0.0	0.0

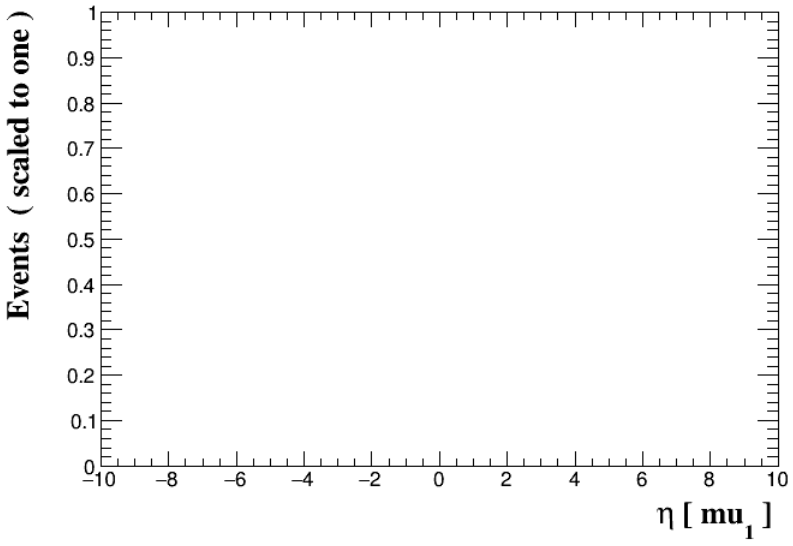

Figure 13.

3.22 Histogram 14

*** Plot: MT_MET (mu[1])**

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
tag_1_pythia8_	0.0 +/- 0.0	1.0	0.0	0.0	0.0	0.0

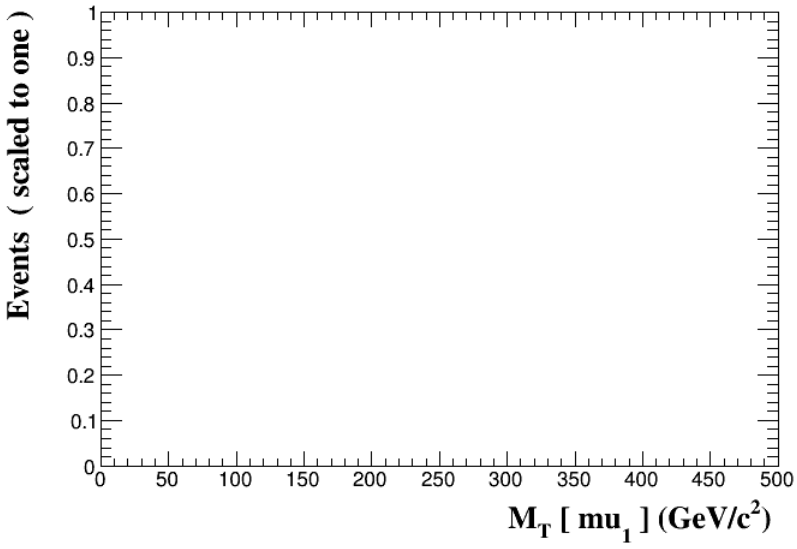

Figure 14.

3.23 Histogram 15

*** Plot: M (e[1] mu[1])**

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
tag_1_pythia8_	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0

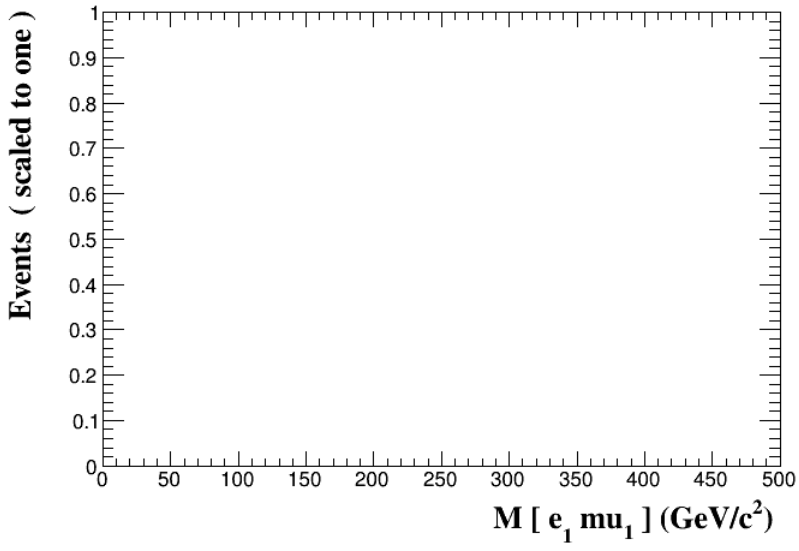

Figure 15.

3.24 Histogram 16

*** Plot: M (e[1] j[1])**

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
tag_1_pythia8_	0.0 +/- 0.0	1.0	0.0	0.0	0.0	0.0

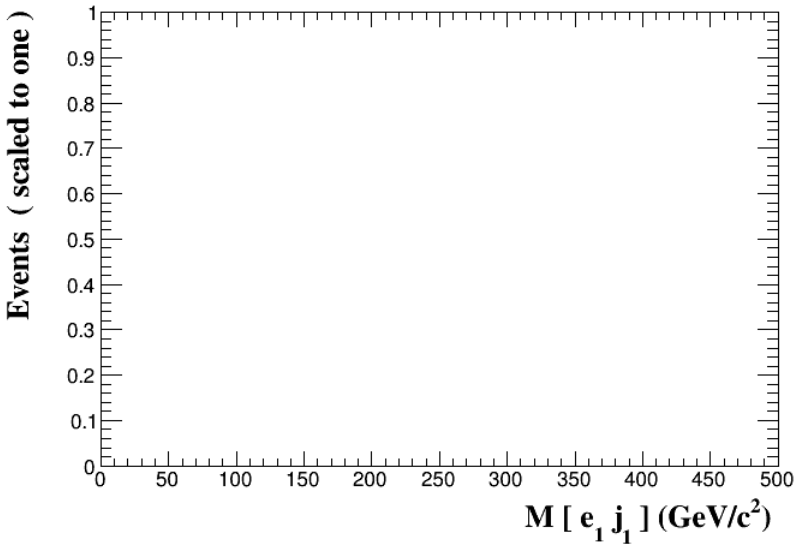

Figure 16.

3.25 Histogram 17

*** Plot: M (j[1] j[2])**

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
tag_1_pythia8_	0.0 +/- 0.0	1.0	0.0	0.0	0.0	0.0

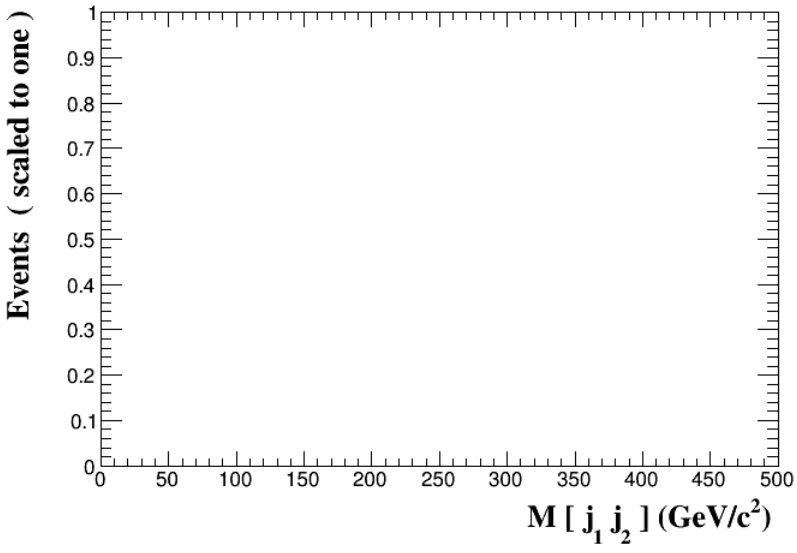

Figure 17.

3.26 Histogram 18

*** Plot: M (j[1] mu[1])**

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
tag_1_pythia8_	0.0 +/- 0.0	1.0	0.0	0.0	0.0	0.0

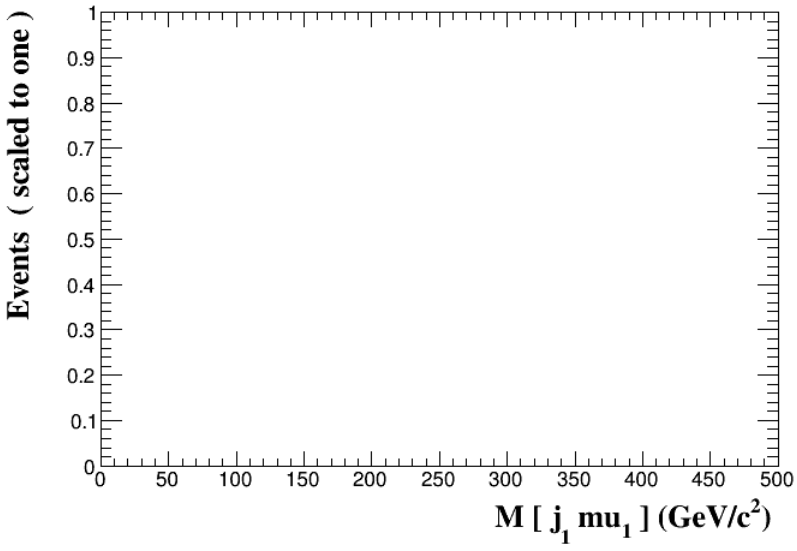

Figure 18.

3.27 Histogram 19

*** Plot: M (e[1] j[2])**

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
tag_1_pythia8_	0.0 +/- 0.0	1.0	0.0	0.0	0.0	0.0

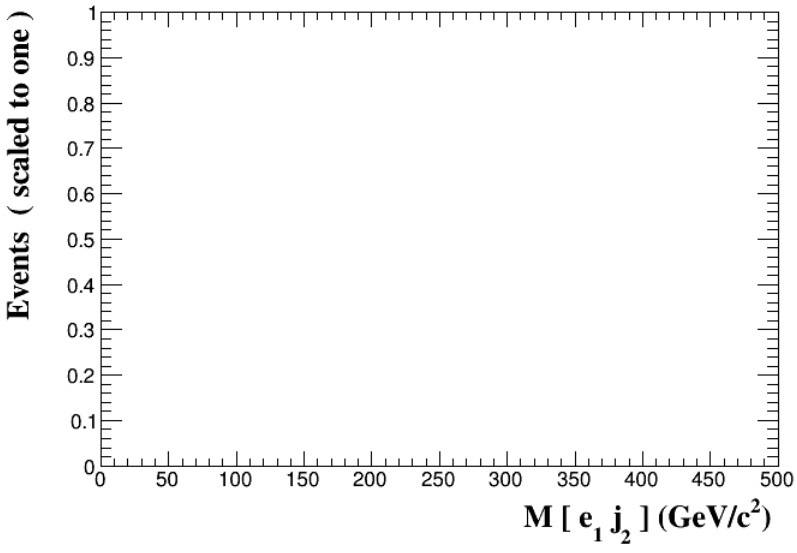

Figure 19.

3.28 Histogram 20

*** Plot: M (j[2] mu[1])**

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
tag_1_pythia8_	0.0 +/- 0.0	1.0	0.0	0.0	0.0	0.0

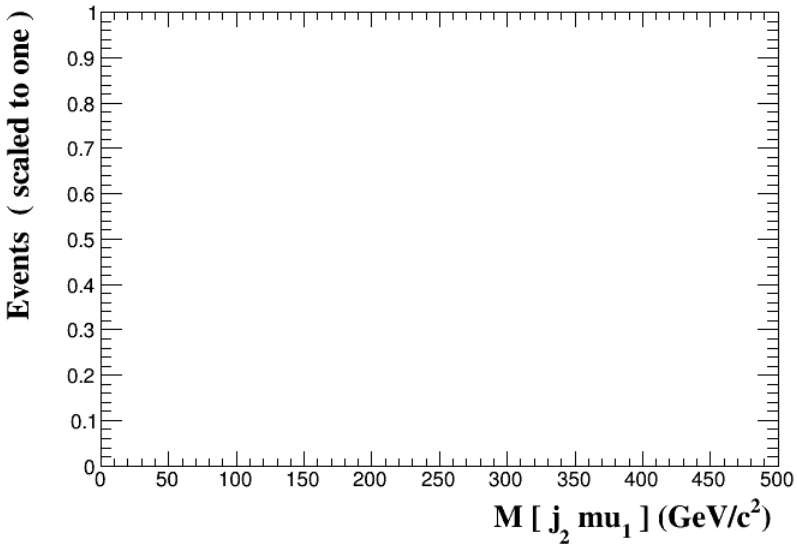

Figure 20.

3.29 Histogram 21

*** Plot: DELTAR (e[1] , mu[1])**

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
tag_1_pythia8_	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0

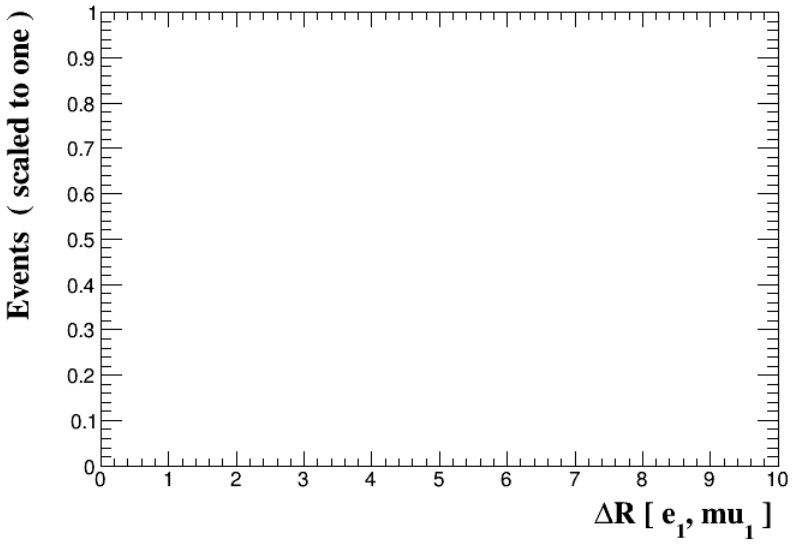

Figure 21.

3.30 Histogram 22

*** Plot: DELTAR (j[1] , e[1])**

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
tag_1_pythia8_	0.0 +/- 0.0	1.0	0.0	0.0	0.0	0.0

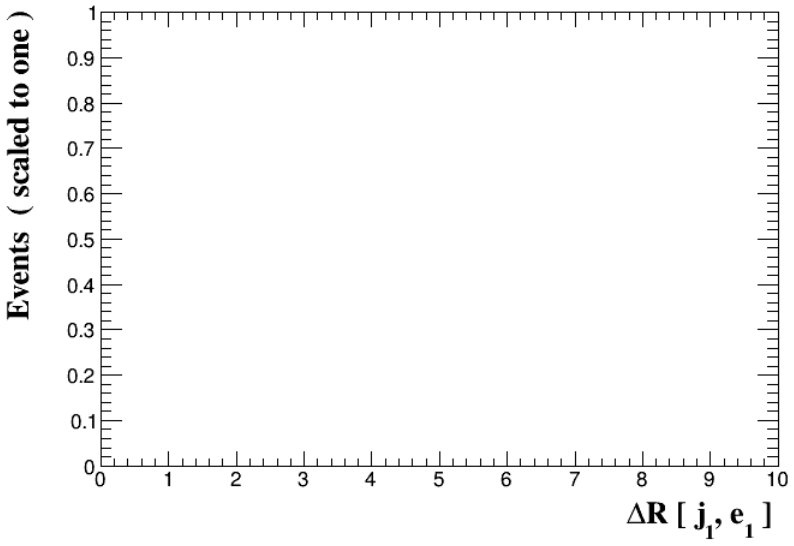

Figure 22.

3.31 Histogram 23

*** Plot: DELTAR (j[1] , j[2])**

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
tag_1_pythia8_	0.0 +/- 0.0	1.0	0.0	0.0	0.0	0.0

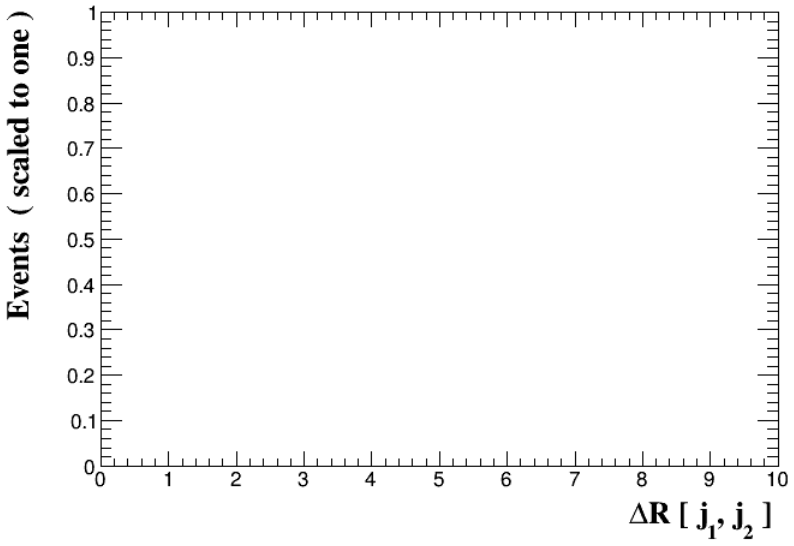

Figure 23.

3.32 Histogram 24

*** Plot: DELTAR (j[1] , mu[1])**

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
tag_1_pythia8_	0.0 +/- 0.0	1.0	0.0	0.0	0.0	0.0

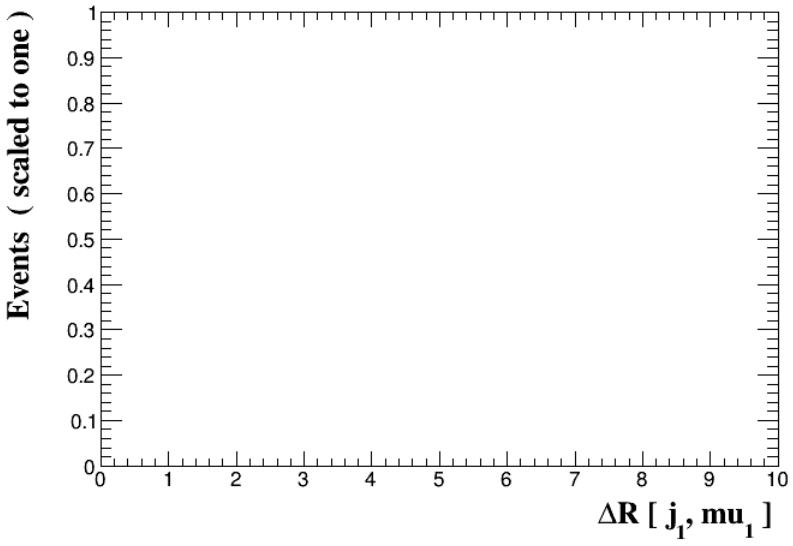

Figure 24.

3.33 Histogram 25

*** Plot: DELTAR (j[2] , e[1])**

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
tag_1_pythia8_	0.0 +/- 0.0	1.0	0.0	0.0	0.0	0.0

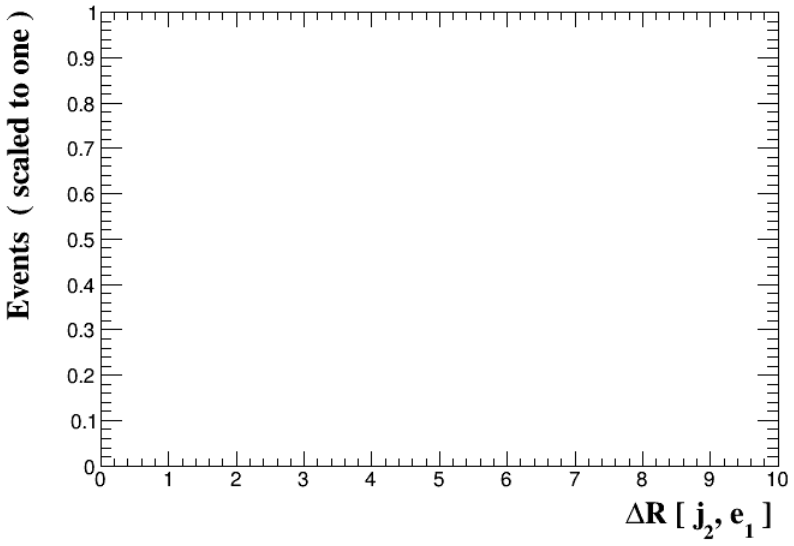

Figure 25.

3.34 Histogram 26

*** Plot: DELTAR (j[2] , mu[1])**

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
tag_1_pythia8_	0.0 +/- 0.0	1.0	0.0	0.0	0.0	0.0

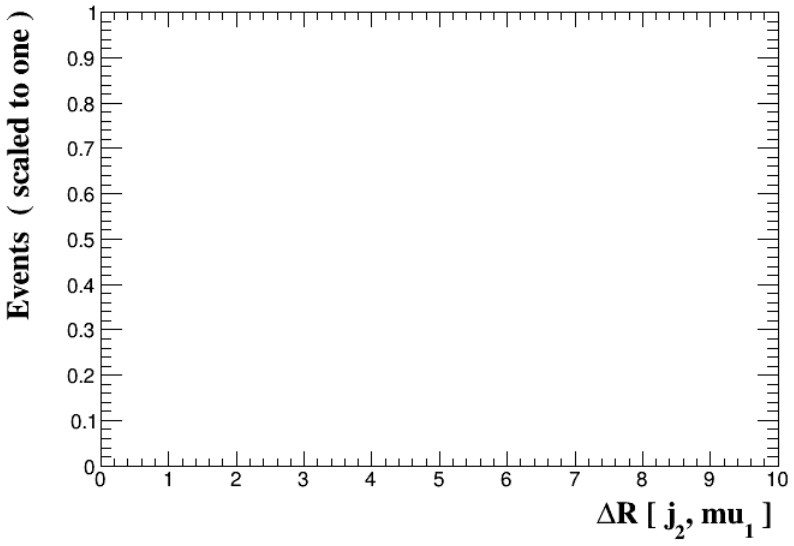

Figure 26.

4 Summary

4.1 Cut-flow charts

- How to compare signal (S) and background (B): S/sqrt(S+B) .
- Object definition selections are indicated in cyan.
- Reject and select are indicated by 'REJ' and 'SEL' respectively

Cuts	Signal (S)	Background (B)	S vs B
Initial (no cut)	0.0 +/- 0.0		