



# The LaTeX report

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## Contents

<b>1</b>	<b>Setup</b>	<b>2</b>
1.1	Command history	2
1.2	Configuration	2
<b>2</b>	<b>Datasets</b>	<b>3</b>
2.1	signal	3
<b>3</b>	<b>Histos and cuts</b>	<b>4</b>
3.1	Histogram 1	4

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# 1 Setup

## 1.1 Command history

```
ma5># set directory where running "./bin/ma5"; set lumi; define the signal significance
ma5>set main.currentdir = /Users/elijahsheridan/MG5_aMC_v2_6_5/axion_pheno/madgraph_data
# need to change this directory path -> exit and type "pwd" to get the path
ma5>set main.lumi = 40
ma5>set main.fom.formula = 5
ma5>set main.fom.x = 0.0
ma5># import samples -> change the path to the LHE file
ma5>import /Users/elijahsheridan/MG5_aMC_v2_6_5/axion_pheno/madgraph_data/axion_signal/-
axion_signal_no_cuts_1MeV.lhe.gz as signal
ma5># define bg and signal samples
ma5>set signal.type = signal
ma5># a jet can be from a light quark or b quark
ma5>define jets = j
ma5>define e = e+ e-
ma5>define mu = mu+ mu-
ma5>define ta = ta+ ta-
ma5>define lept = e mu ta
ma5>define ax = 9000005
ma5># define which plots to make
ma5>plot M(jets[1] jets[2])
ma5>#set the plot/graph parameters
ma5>set selection[1].xmin = 50
ma5>set selection[1].xmax = 110
ma5>set selection[1].nbins = 30
ma5>set selection[1].rank = PTordering
ma5>set selection[1].titleX = "M[j_{1},j_{2}] (GeV)"
ma5>submit no_mg_cuts_mjj_zoom
```

## 1.2 Configuration

- MadAnalysis version 1.6.33 (2017/11/20).
- Histograms given for an integrated luminosity of  $40.0\text{fb}^{-1}$ .

## 2 Datasets

### 2.1 signal

- Sample consisting of: [signal](#) events.
- Generated events: [10000](#) events.
- Normalization to the luminosity: [31440+/- 48](#) events.
- **Ratio (event weight): 3.1 - warning: please generate more events (weight larger than 1)!**

Path to the event file	Nr. of events	Cross section (pb)	Negative wgts (%)
axion_pheno/- madgraph_data/axion_signal/- axion_signal_no_cuts_1MeV.lhe.gz	10000	0.786 @ 0.15%	0.0

### 3 Histos and cuts

#### 3.1 Histogram 1

\* Plot:  $M(j_1, j_2)$

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
signal	31437	1.0	997.007	691.5	0.13	98.46

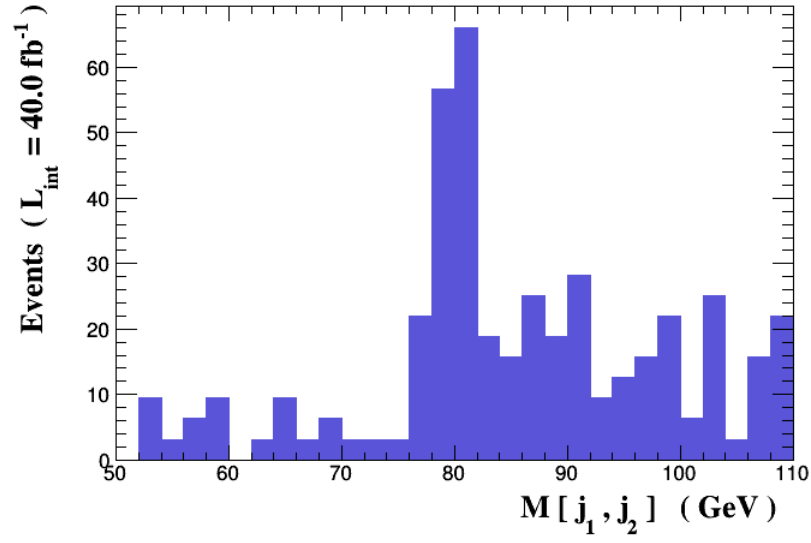


Figure 1.