# The LaTeX report

**Generated by elijahsheridan on 26 June 2020, 23:00:36**

This report has been generated automatically by MadAnalysis 5.

Please cite:

> **E. Conte, B. Fuks and G. Serret**,
> *MadAnalysis 5, A User-Friendly Framework for Collider Phenomenology*,
> Comput. Phys. Commun. **184** (2013) 222-256,
> arXiv:1206.1599 [hep-ph].

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## Contents

# 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_signal/Events/1MeV_gurrola_cuts_cross_sec/-
unweighted_events.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 ETA(ax)
ma5>#set selection[1].statuscode = allstate
ma5>#set the plot/graph parameters
ma5>#set selection[1].xmin = -10
ma5>#set selection[1].xmax = 10
ma5>#set selection[1].nbins = 200
ma5>#set selection[1].titleX = "η[ax]"
  ma5>submit 1MeV_axion_rapidity
```

## 1.2 Configuration

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

## 2 Datasets

### 2.1 signal

- Samples stored in the directory: /Users/elijahsheridan/MG5_aMC_v2_6_5/axion_pheno/-post_optimization_studies .
- Sample consisting of: signal events.
- Generated events: 1000 events.
- Normalization to the luminosity: 406568+/- 2950 events.
- Ratio (event weight): 406 - warning: please generate more events (weight larger than 1)!

| Path to the event file | Nr. of events | Cross section (pb) | Negative wgts (%) |
|---|---|---|---|
| /Users/elijahsheridan/-MG5_aMC_v2_6_5/-axion_signal/Events/-1MeV_gurrola_cuts_cross_sec/-unweighted_events.lhe.gz | 1000 | 10.2 @ 0.73% | 0.0 |

# 3 Histos and cuts

## 3.1 Histogram 1

```
* Plot:  ETA ( ax )
```

| Dataset | Integral | Entries per event | Mean | RMS | % underflow | % overflow |
|---|---|---|---|---|---|---|
| signal | 406162 | 1.0 | 0.0395255 | 1.366 | 0.0 | 0.0 |

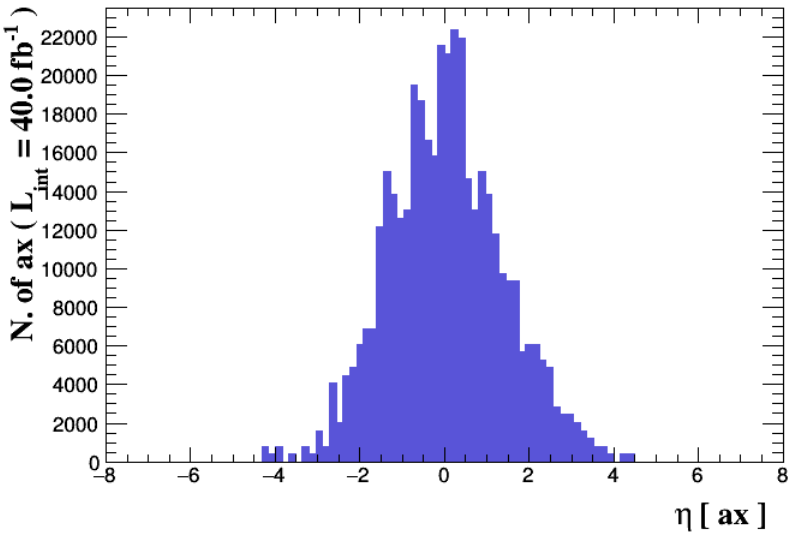


**Figure 1**.