

# Mismatch DY

See [MADGRAPH5/MADGRAPH4GPU#944](#).

## Introduction

See [PREVIOUS REPORT](#).

## Investigation on DY+3j

Computation with `madgraph4gpu` with FORTRAN backend still ongoing.

## Investigation `e+ e- > mu+ mu- a`

Run both with upstream madgraph and gpu version with FORTRAN backend. Use default run card.

## Setup

Setup `mg5amcnlo`:

- local machine (CERN ThinkPad)
- `mg5amcnlo@80a6c4b7d8be479c0388424d6a3ebafaaac0aa0c`, tag: `3.6.0`
- Python 3.9.18
- Fortran (GCC) 11.4.1

Setup `madgraph4gpu`:

- run on `itscrd-v100.cern.ch`
- `madgraph4gpu@2cb6c41729af9f7e7c3a37e0b4fa754e1b4cd483`, tag: `master_june24`, submodule

mg5amcnlo@8c70b1ba4c0f01257d8aa2d337fff716f1ef7e55

- Python 3.9.18
- Fortran (GCC) 11.4.1

## Results 500 GeV

Results in 1e-2 pb, 10k events.

### Upstream

beam energy / GeV	sde_strategy	
	1	2
500	2.646 +- 0.0076	2.599 +- 0.008
	2.651 +- 0.0072	2.579 +- 0.0097
	2.642 +- 0.0068	2.583 +- 0.0094
	2.645 +- 0.0091	2.584 +- 0.0091
	2.653 +- 0.0068	2.601 +- 0.0099
	2.661 +- 0.0078	2.609 +- 0.012
	2.634 +- 0.0078	2.578 +- 0.011
	2.651 +- 0.0084	2.601 +- 0.0094
	2.646 +- 0.0086	2.596 +- 0.0095
	2.656 +- 0.0078	2.605 +- 0.0094
average	2.65 +- 0.0078	2.594 +- 0.0098

### madgraph4gpu FORTRAN backend

beam energy / GeV	sde_strategy
	1
500	2.666 +- 0.0051

beam energy / GeV	sde_strategy
	1
	2.664 +- 0.006
	2.669 +- 0.0069
	2.67 +- 0.0061
	2.667 +- 0.0065
average	2.667 +- 0.0061

## Results 6800 GeV

Results in 1e-4 pb.

### Upstream

100k events.

beam energy / GeV	sde_strategy	
	1	2
6800	1.305 +- 1.6e-03	1.275 +- 2.8e-03
	1.275 +- 2.8e-03	1.275 +- 3.4e-03
average	1.290 +- 2.3e-03	1.275 +- 3.1e-03

### madgraph4gpu FORTRAN backend

10k events.

beam energy / GeV	sde_strategy
	1
6800	1.242 +- 0.0033
	1.24 +- 0.0027

<b>beam energy / GeV</b>	<b>sde_strategy</b>
	<b>1</b>
	1.248 +- 0.0027
	1.245 +- 0.0029
	1.247 +- 0.0033
average	1.244 +- 0.0030