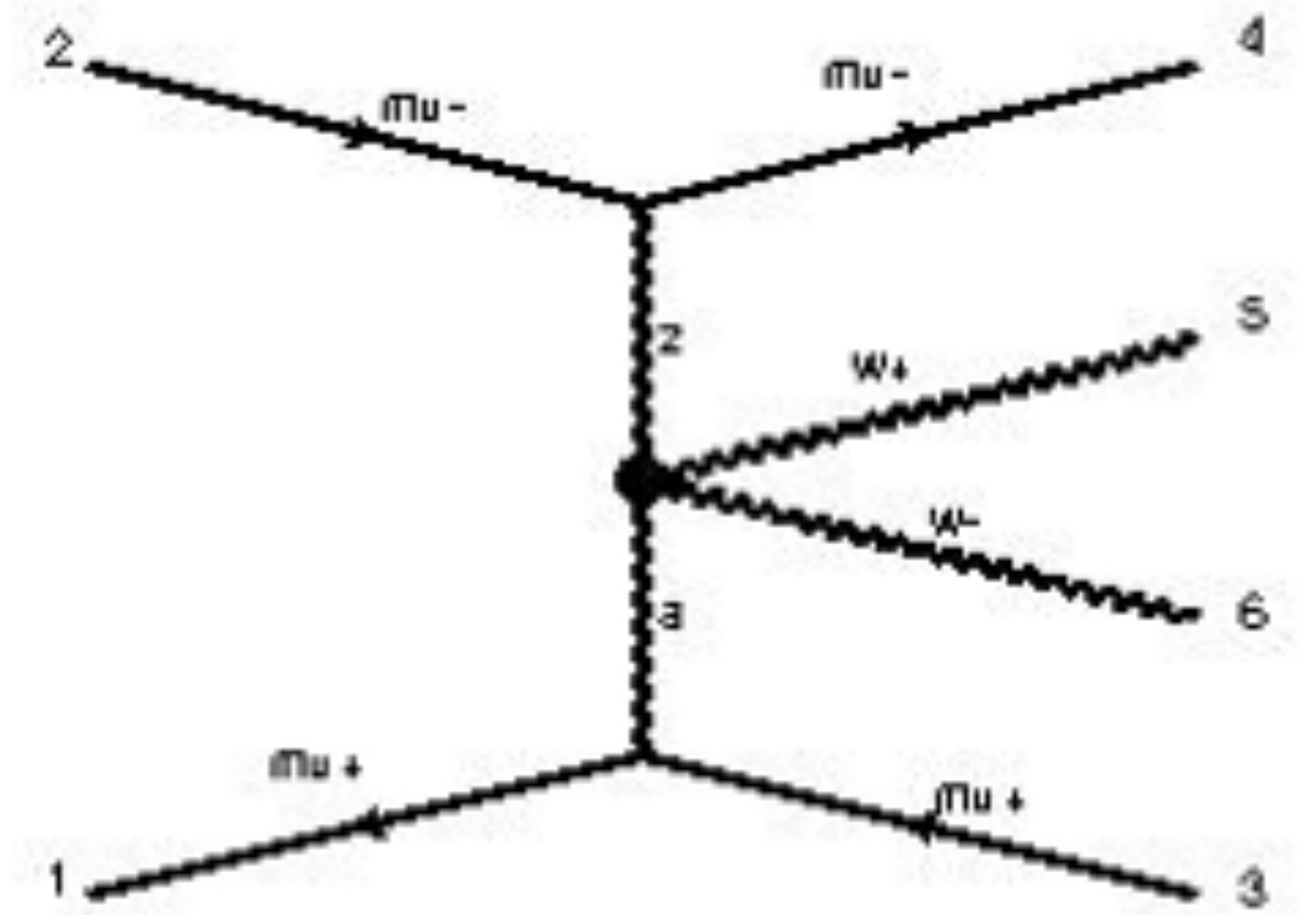
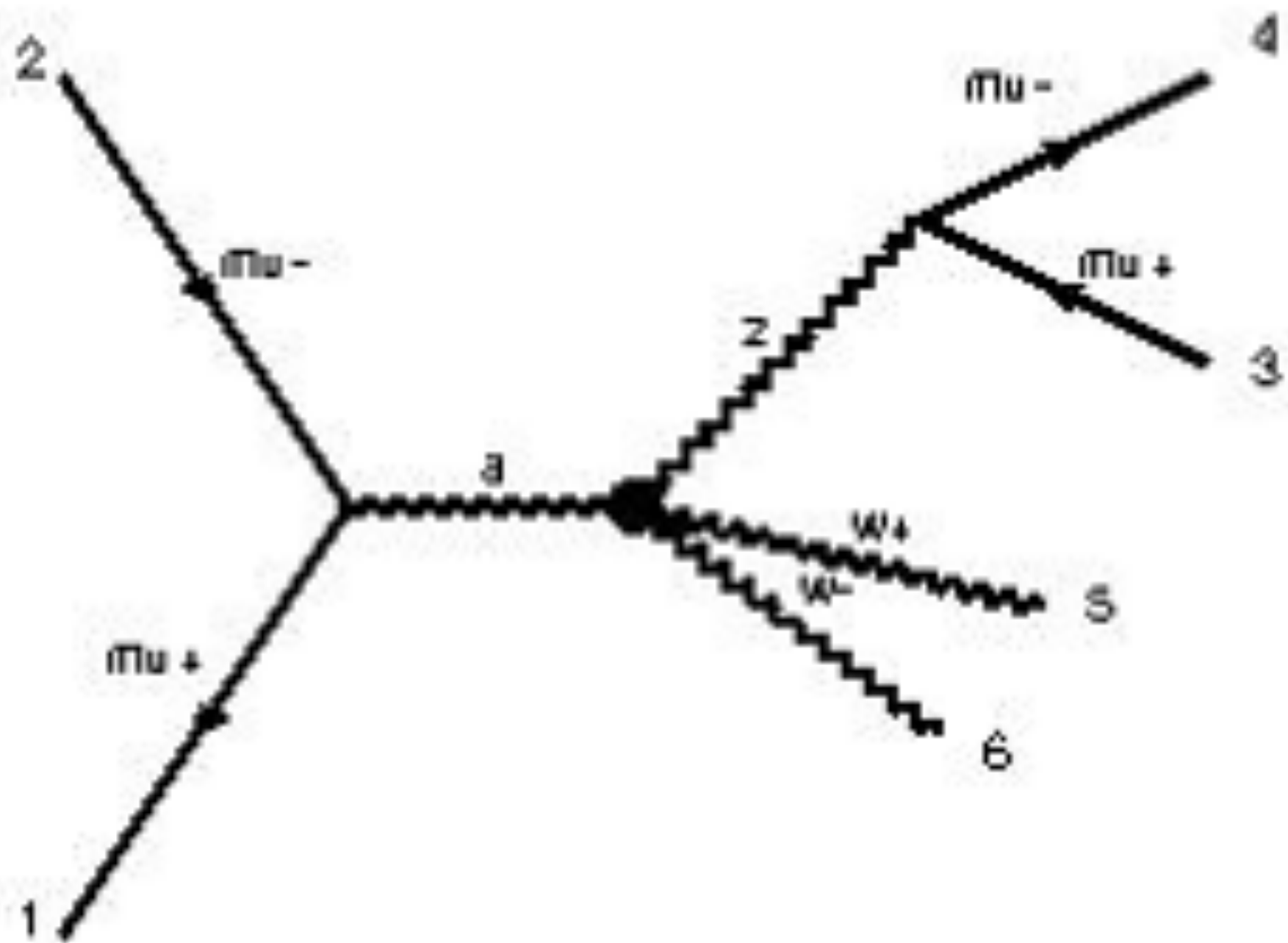


# MuMu->MuMuWW Update

Connor Waits 3-8-22

# Signal Process

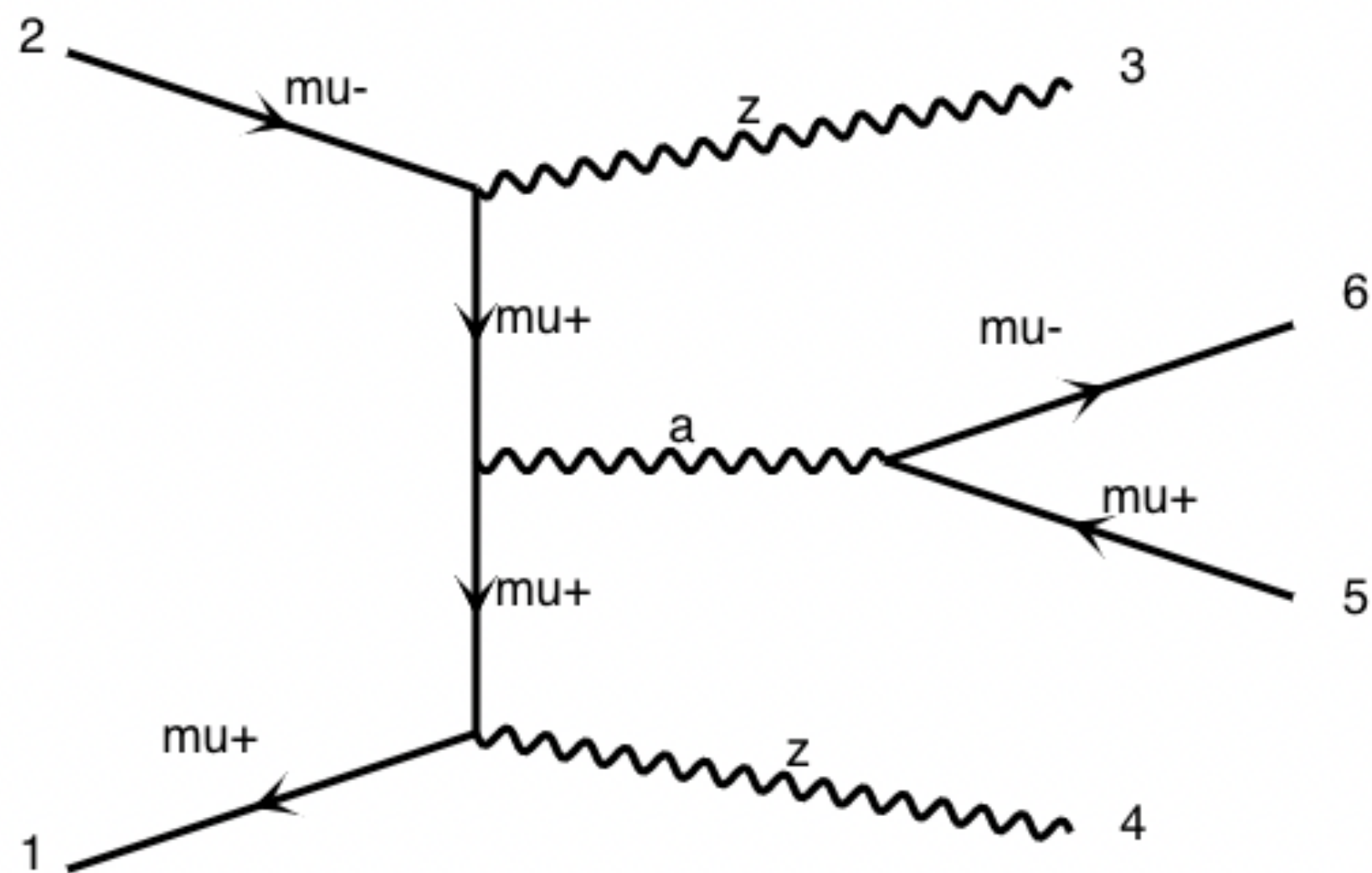
Final State: 2 muons and 2 jets coming from W decays  
2 Cases:  $|\text{mass}(\text{mumu})-91|<15$  and  $|\text{mass}(\text{mumu})-91|>15$



# Background Processes

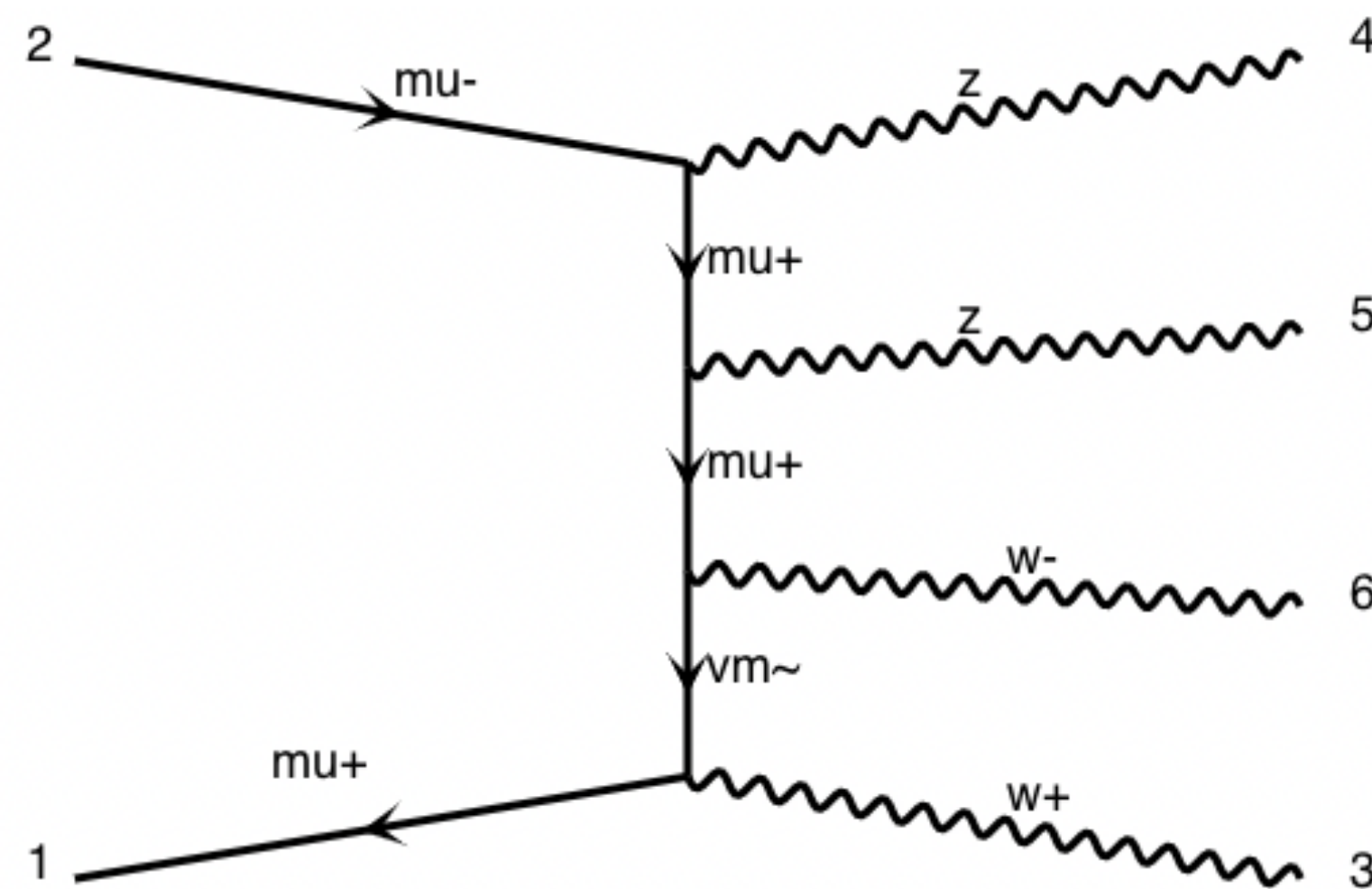
## Diboson

Cross Section: 0.0018 pb (6 TeV)



## Quadobson

Cross Section: 0.0024 pb (6 TeV)



SM Background Cross Section: 2.09 pb (6 TeV)

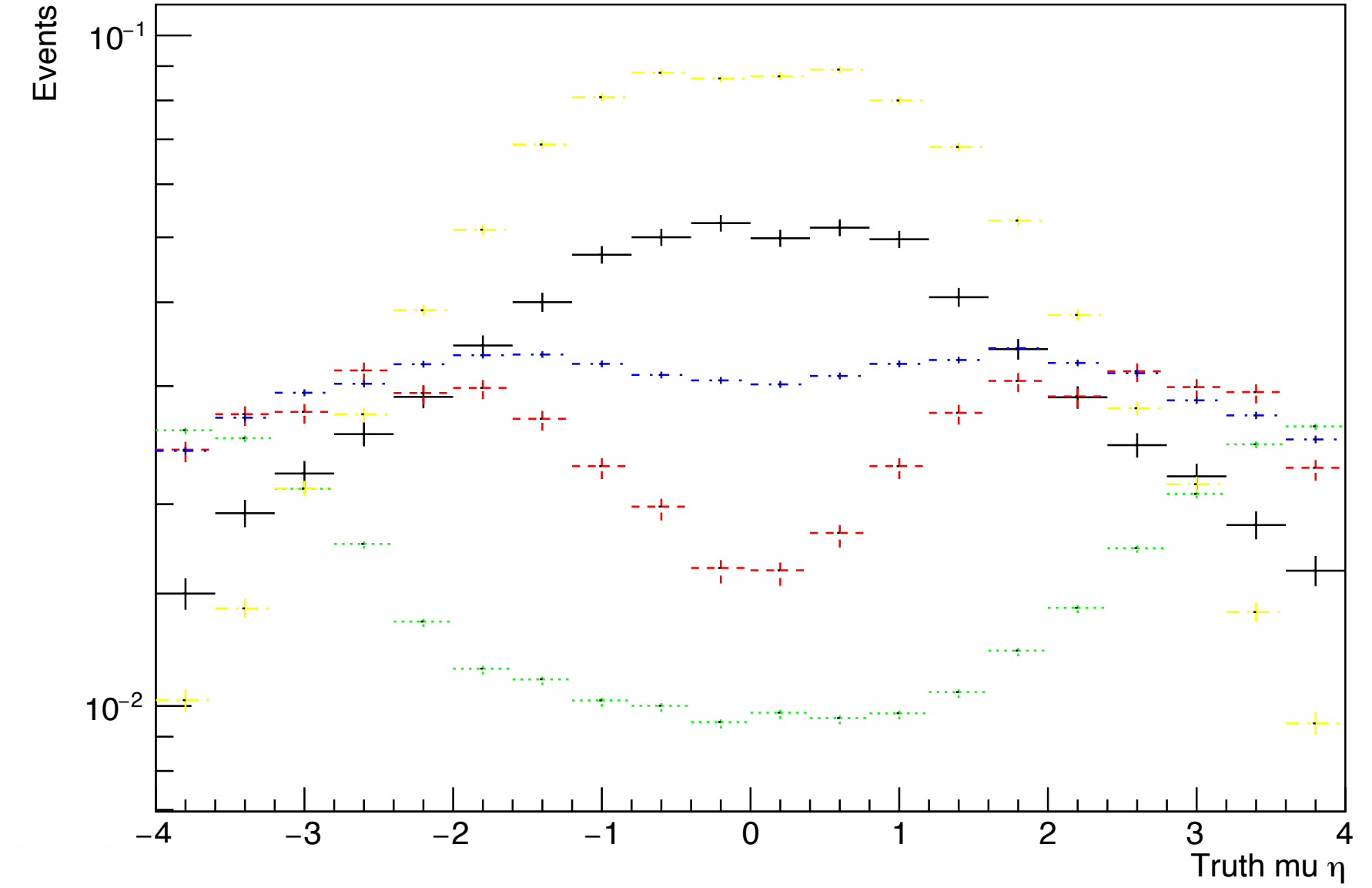
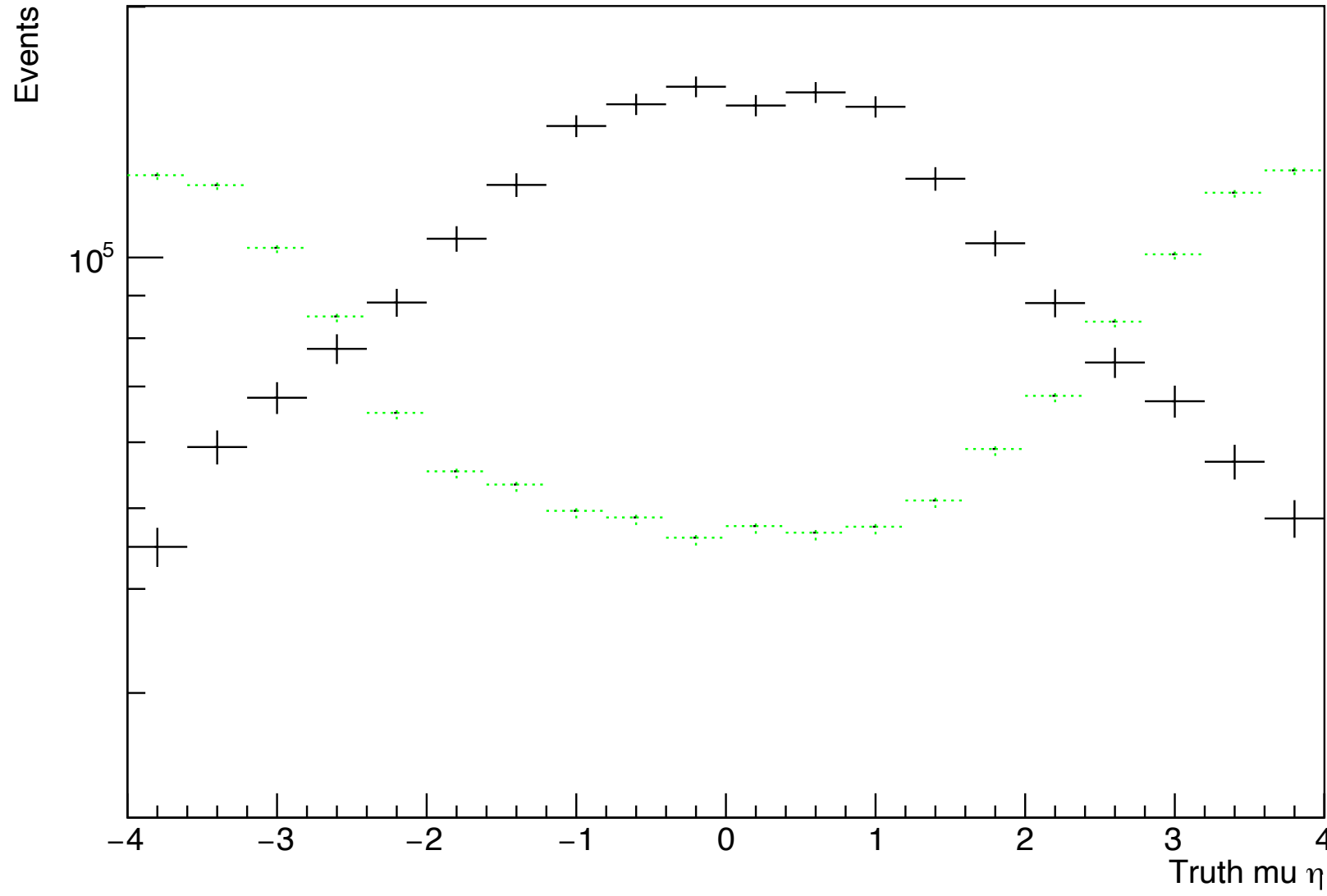
Process	n(muons)==2	m(mumu)>106	n(jets)==2	m(Wjets)>=1	n(Wjets)==2	Total
INT+QUAD	26.53%	69.65%	89.88%	52.38%	48.62%	4.23%
SM	2.57%	77.99%	59.45%	27.68%	38.79%	0.13%
Diboson	9.84%	67.97%	70.53%	31.06%	39.73%	0.58%
Quadboson	5.33%	53.43%	92.31%	56.92%	47.90%	0.72%

Normalized by (cs\*lumi)/#ofEvents

Normalized to Unit Area

T\_mu\_eta

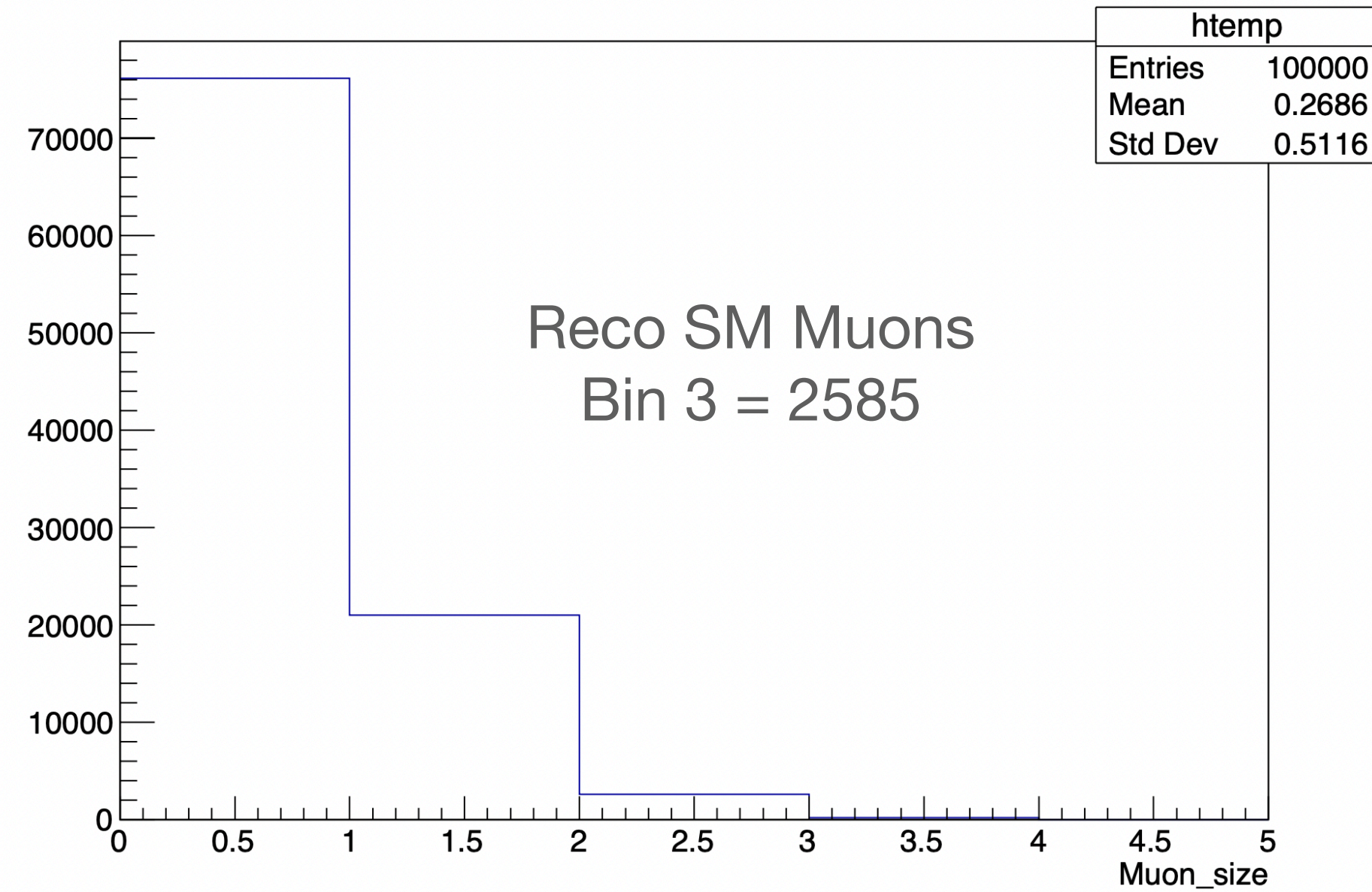
T\_mu\_eta



Plots for No Selection

- INT+QUAD\_1E-12
- - INT+QUAD\_1E-14
- ... SM
- . - . Diboson
- . - . Quadboson

Muon\_size

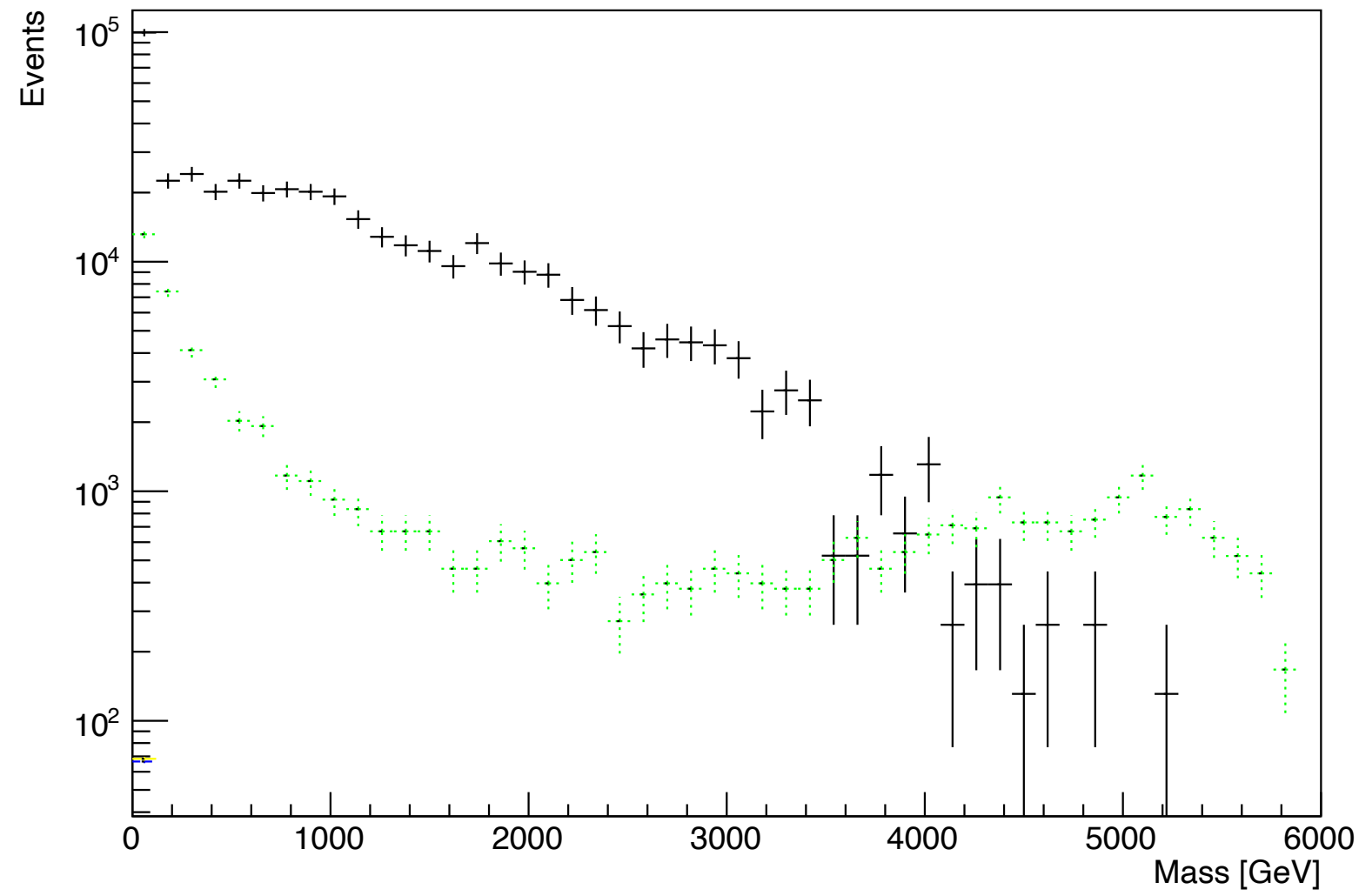


Process	n(muons)==2	m(mumu)>106	n(jets)==2	m(Wjets)>=1	n(Wjets)==2	Total
INT+QUAD	26.53%	69.65%	89.88%	52.38%	48.62%	4.23%
SM	2.57%	77.99%	59.45%	27.68%	38.79%	0.13%
Diboson	9.84%	67.97%	70.53%	31.06%	39.73%	0.58%
Quadboson	5.33%	53.43%	92.31%	56.92%	47.90%	0.72%

Normalized by  $(cs \cdot \text{lumi}) / \# \text{of Events}$

Normalized to Unit Area

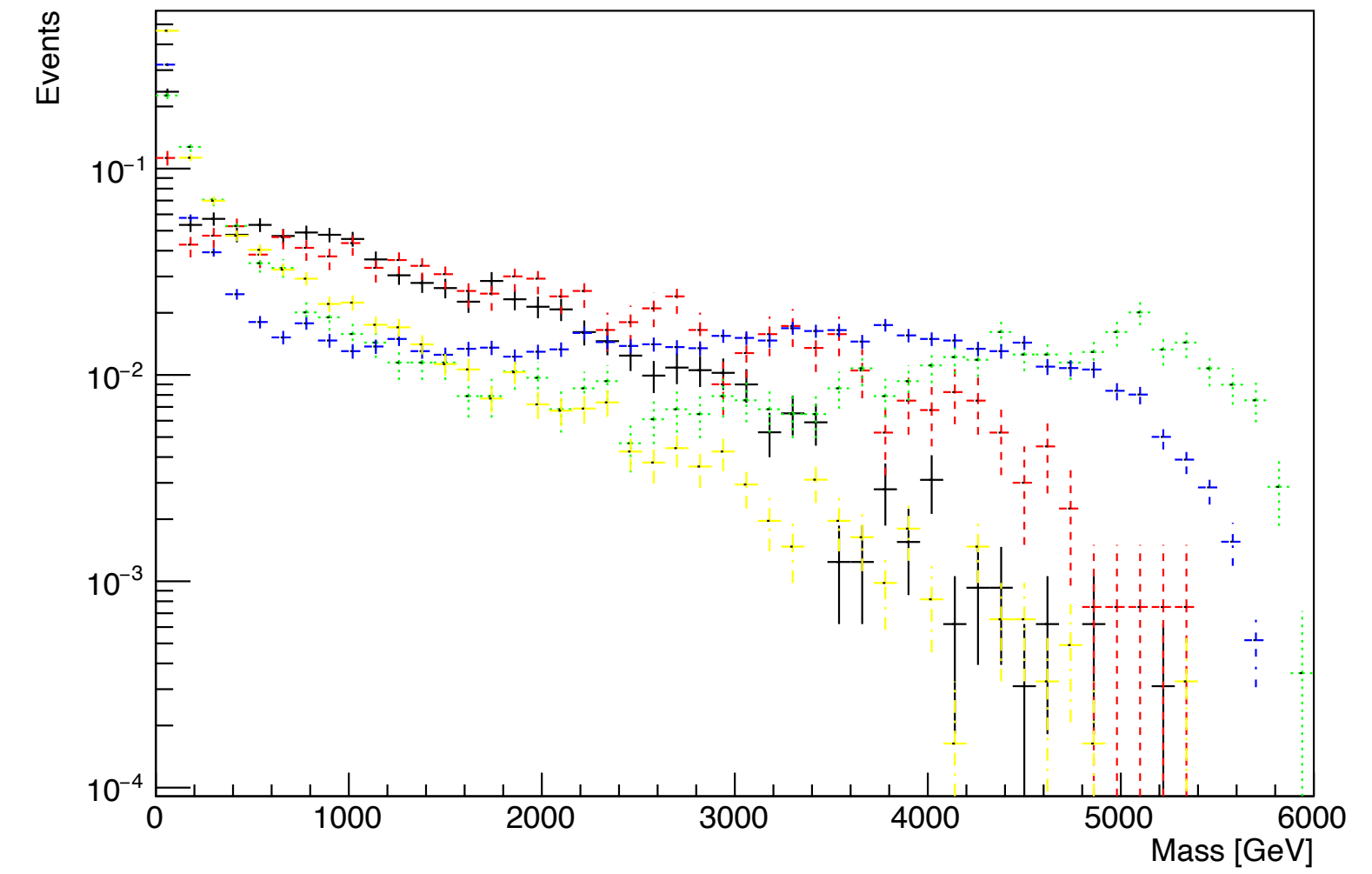
mumu\_mass



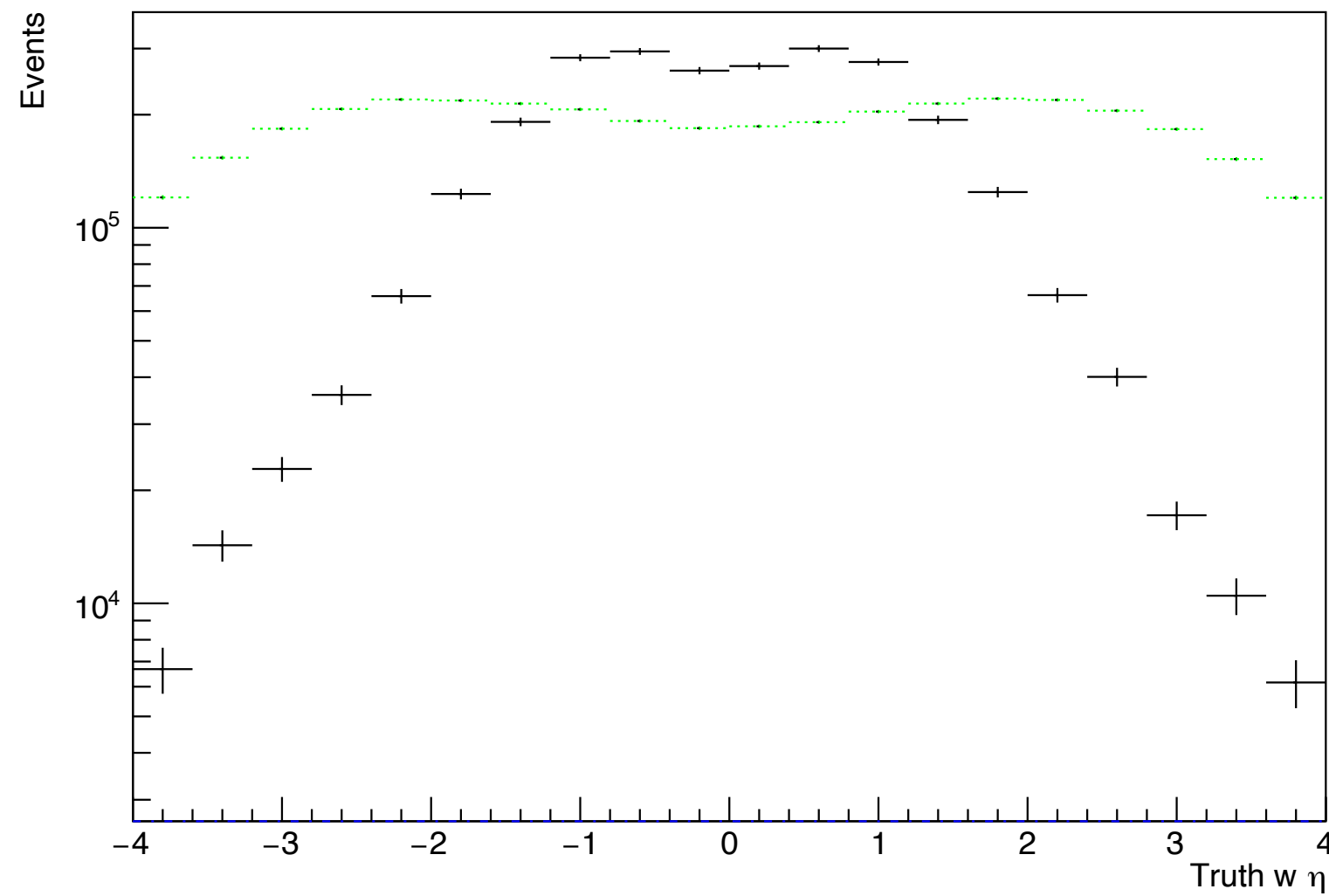
Plots for No Selection

- INT+QUAD\_1E-12
- - - INT+QUAD\_1E-14
- ... SM
- . - . Diboson
- . - . Quadboson

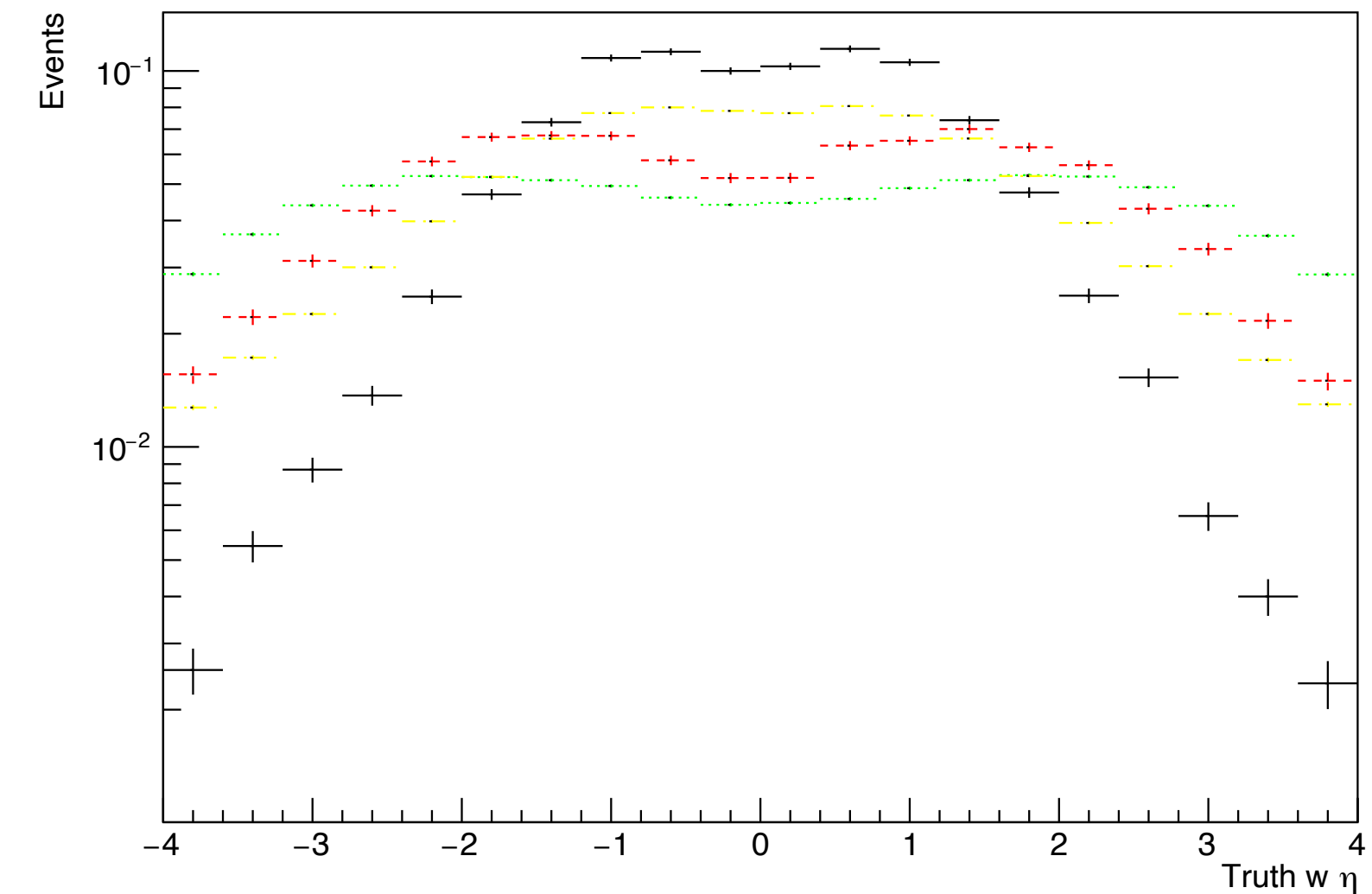
mumu\_mass



T\_w\_eta



T\_w\_eta



Process	n(muons)==2	m(mumu)>106	n(jets)==2	m(Wjets)>=1	n(Wjets)==2	Total
INT+QUAD	26.53%	69.65%	89.88%	52.38%	48.62%	4.23%
SM	2.57%	77.99%	59.45%	27.68	38.79%	0.13%
Diboson	9.84%	67.97%	70.53%	31.06%	39.73%	0.58%
Quadboson	5.33%	53.43%	92.31%	56.92%	47.90%	0.72%

Normalized by (cs\*lumi)/#ofEvents

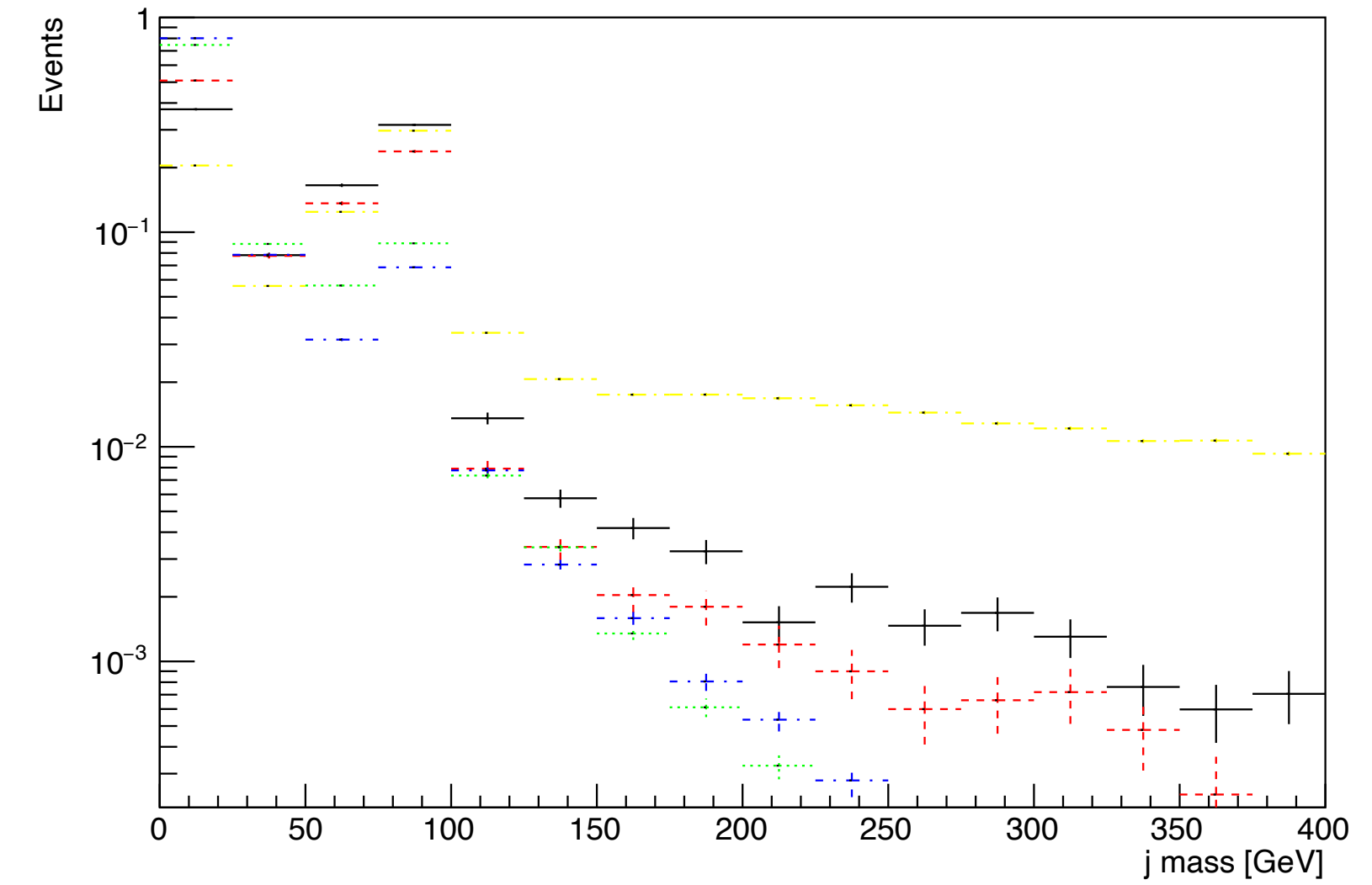
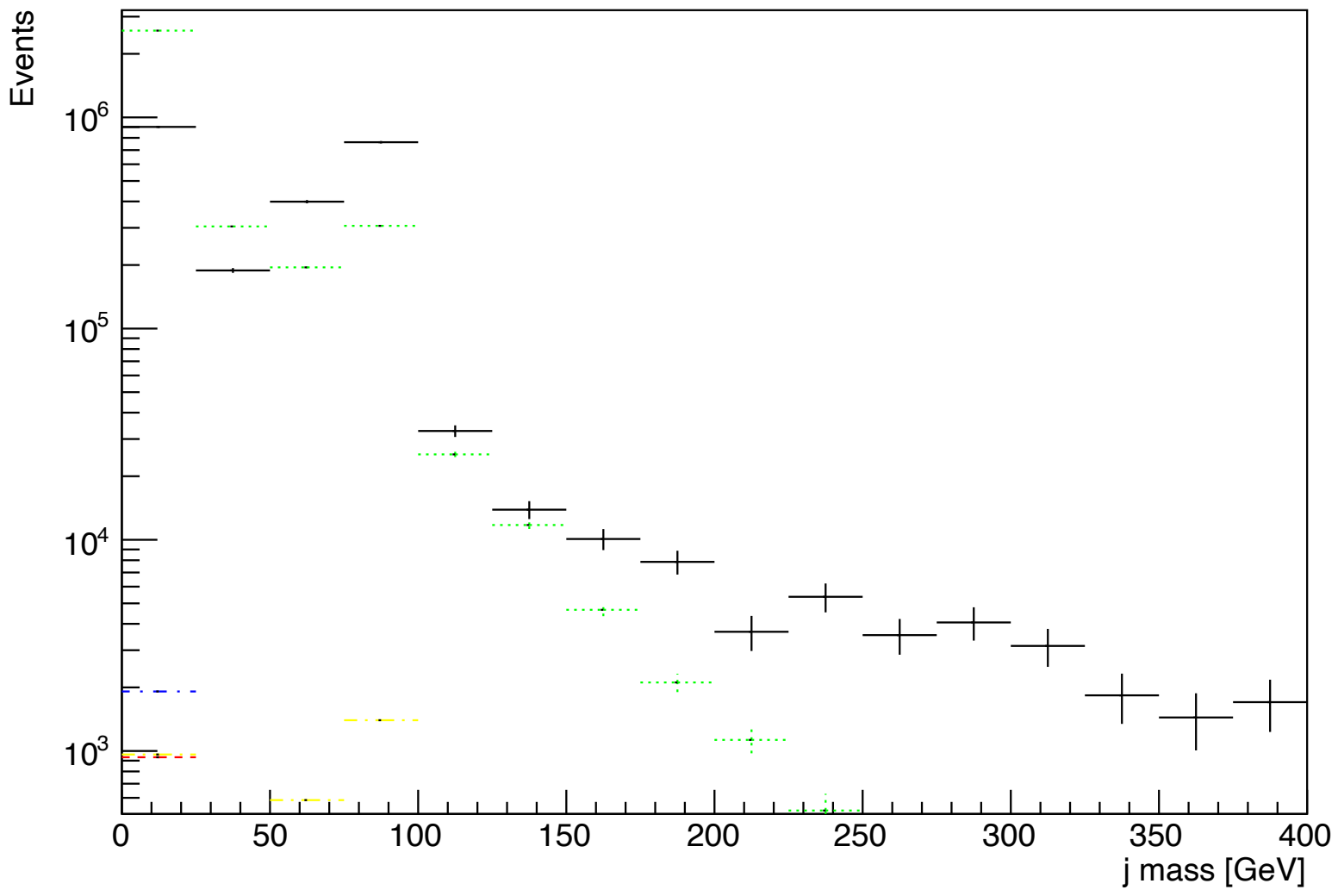
Normalized to Unit Area

Plots for No Selection

- INT+QUAD\_1E-12
- - - INT+QUAD\_1E-14
- ⋯ SM
- · - · Diboson
- · - · Quadboson

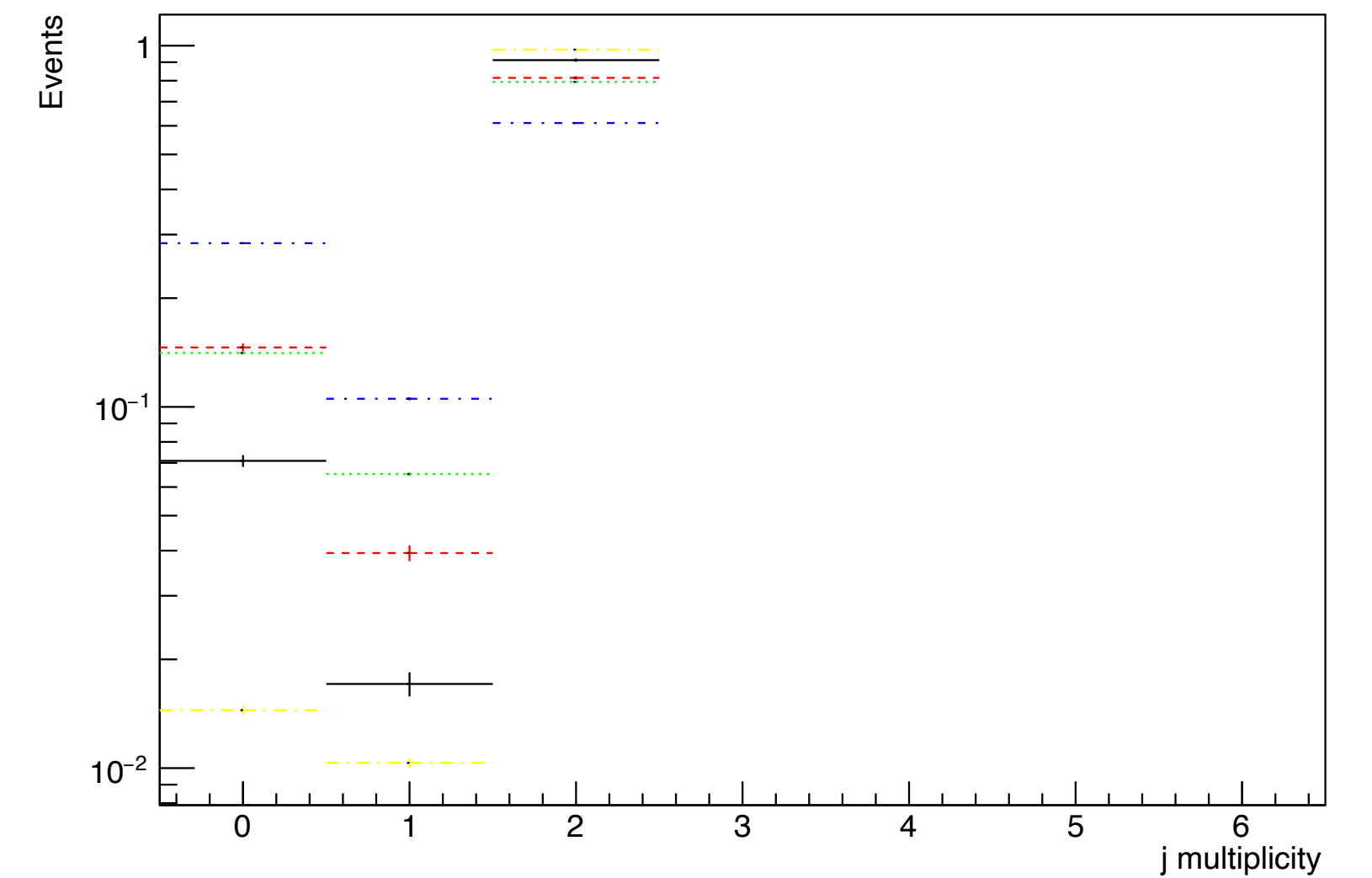
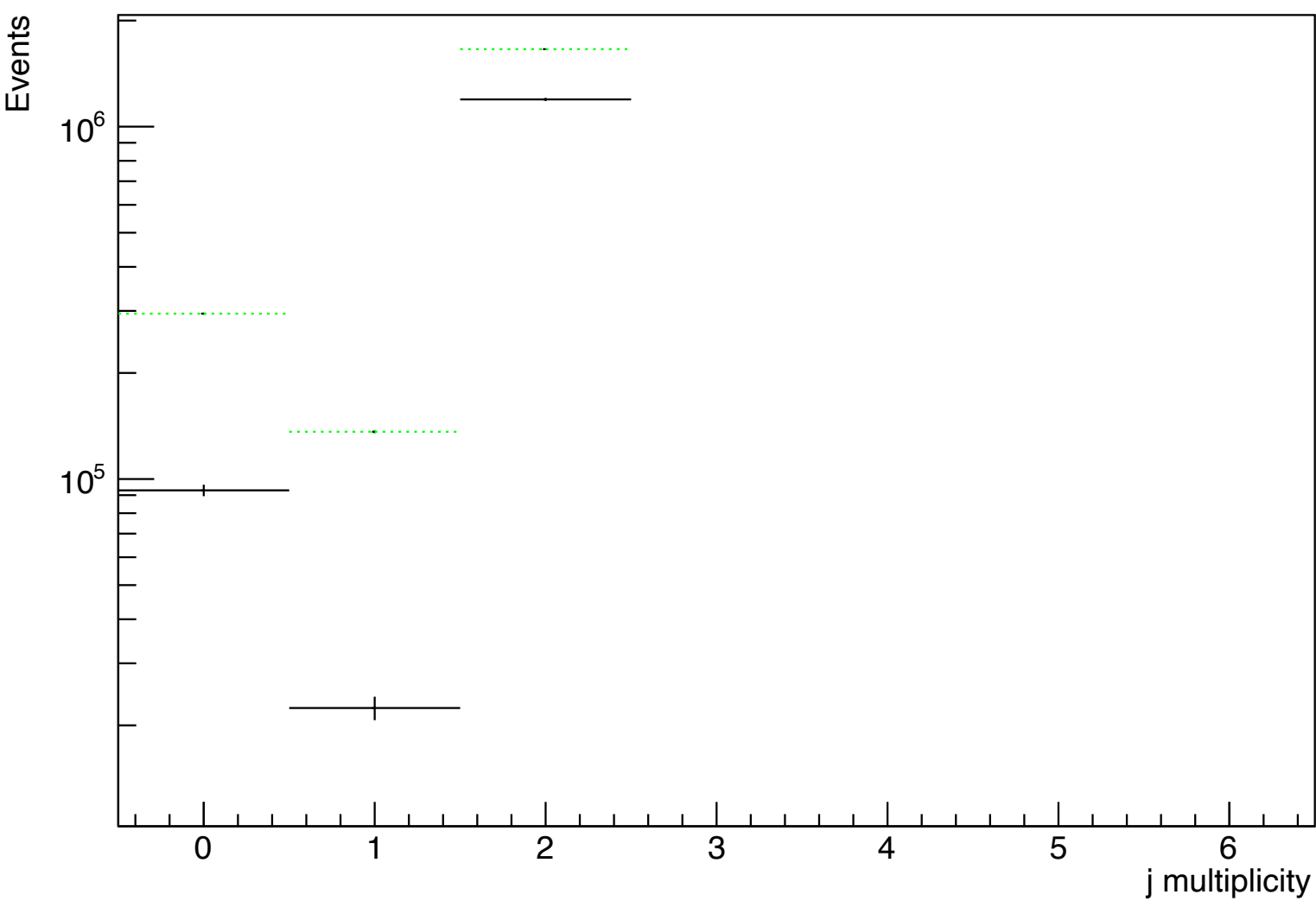
R\_j\_mass\_l

R\_j\_mass\_l



R\_j\_mult

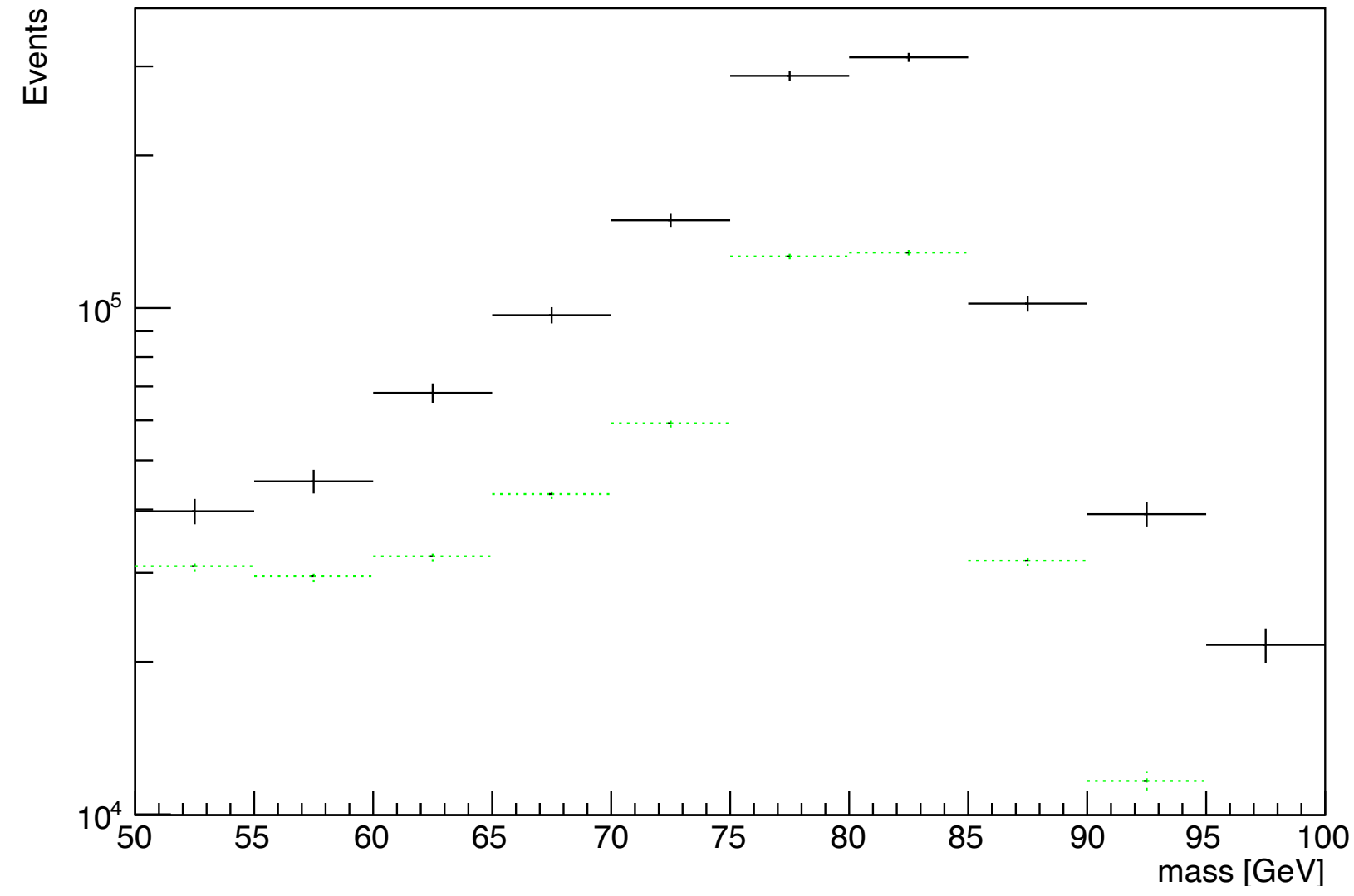
R\_j\_mult



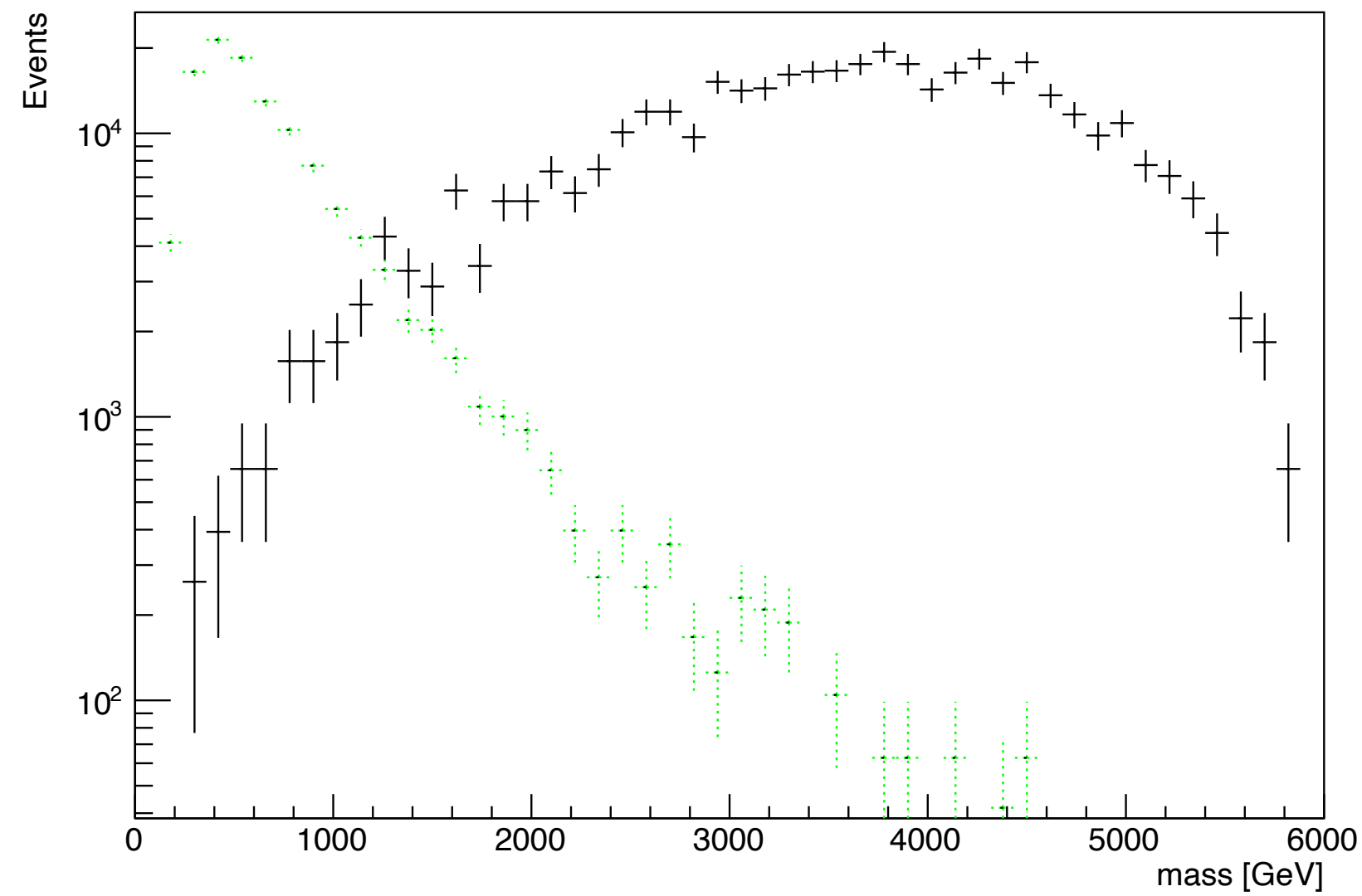
Process	n(muons)==2	m(mumu)>106	n(jets)==2	m(Wjets)>=1	n(Wjets)==2	Total
INT+QUAD	26.53%	69.65%	89.88%	52.38%	48.62%	4.23%
SM	2.57%	77.99%	59.45%	27.68%	38.79%	0.13%
Diboson	9.84%	67.97%	70.53%	31.06%	39.73%	0.58%
Quadboson	5.33%	53.43%	92.31%	56.92%	47.90%	0.72%

Normalized by (cs\*lumi)/#ofEvents

R\_Wjets\_mass

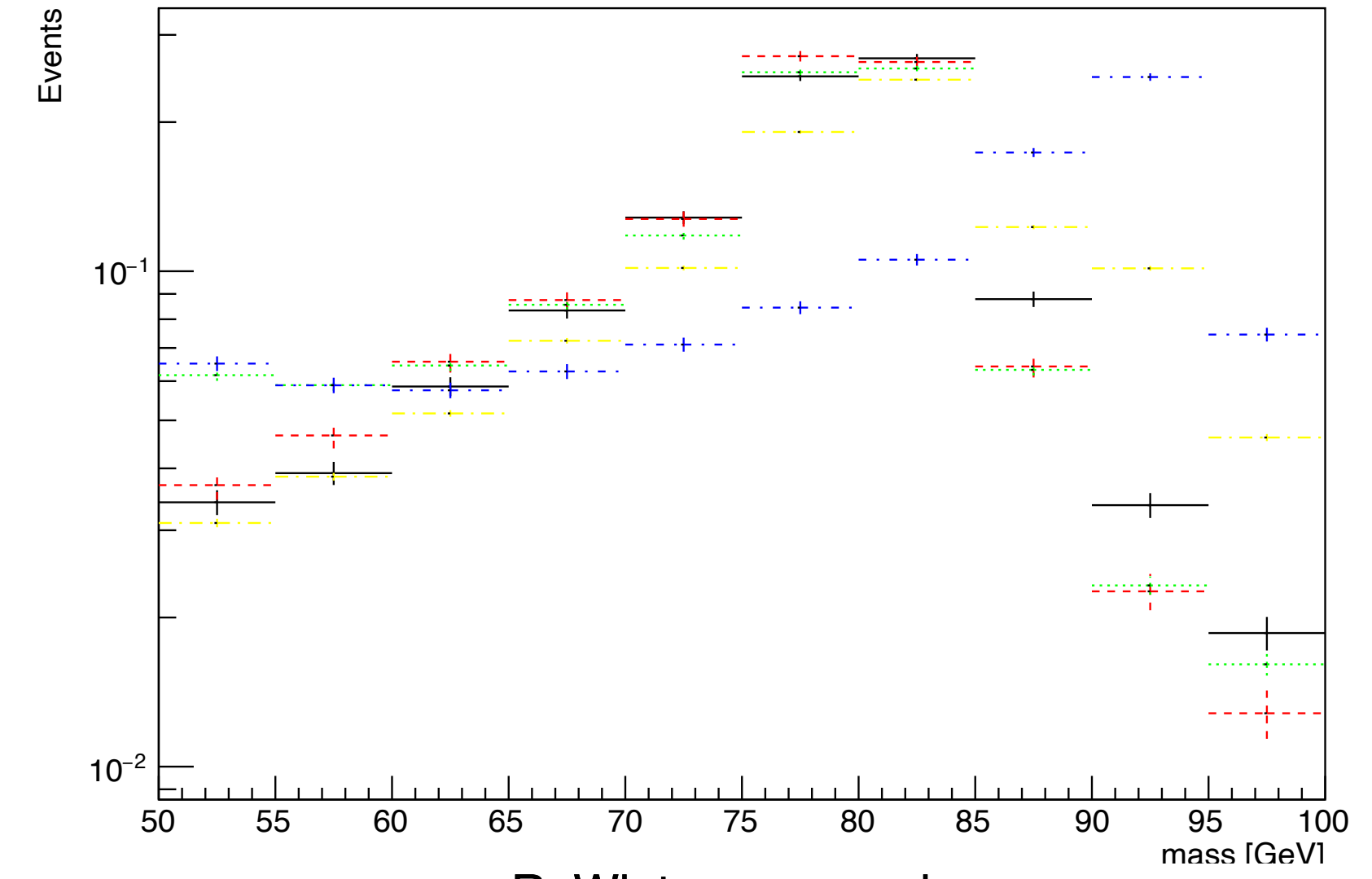


R\_Wjets\_mass\_pairs

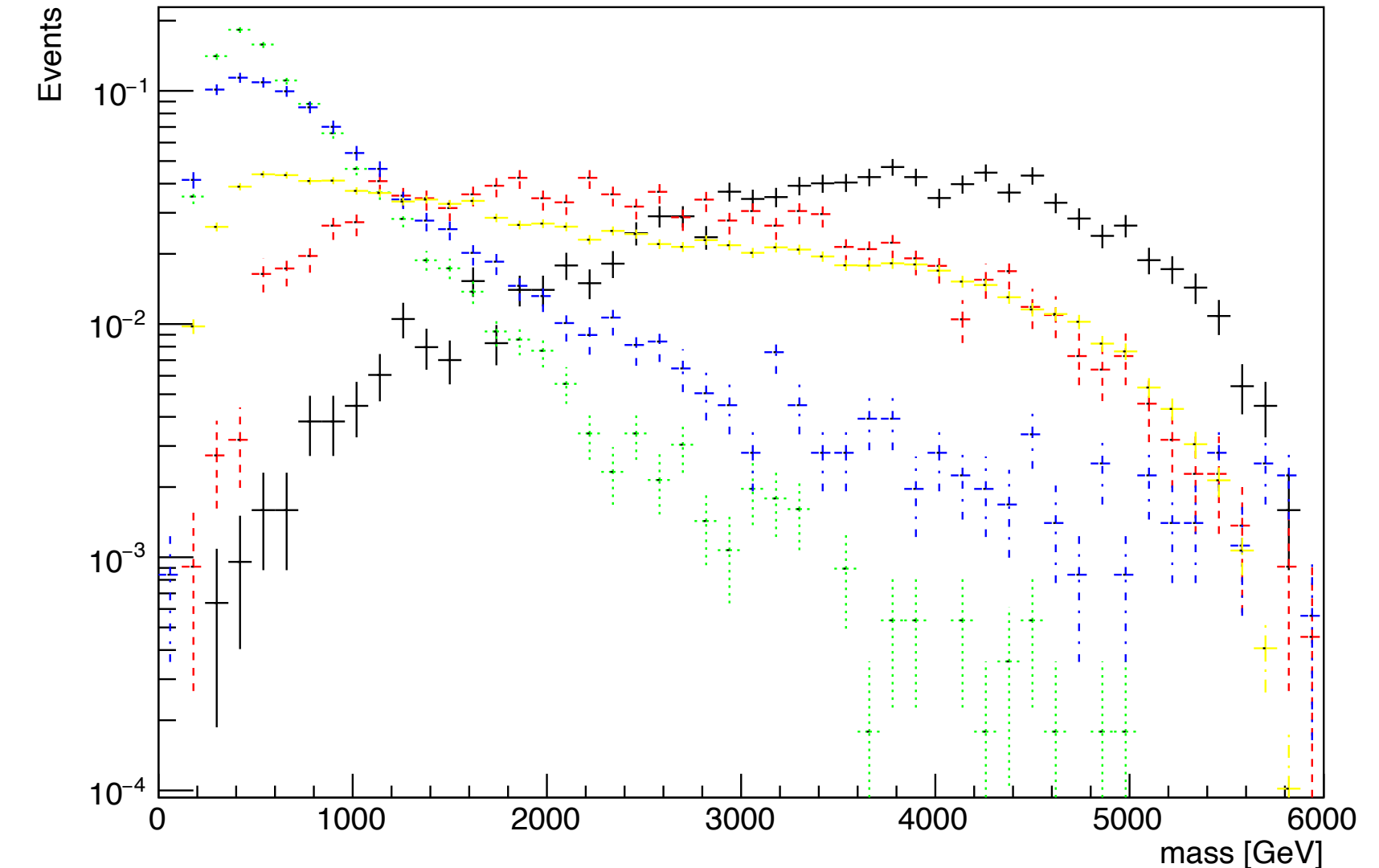


Normalized to Unit Area

R\_Wjets\_mass



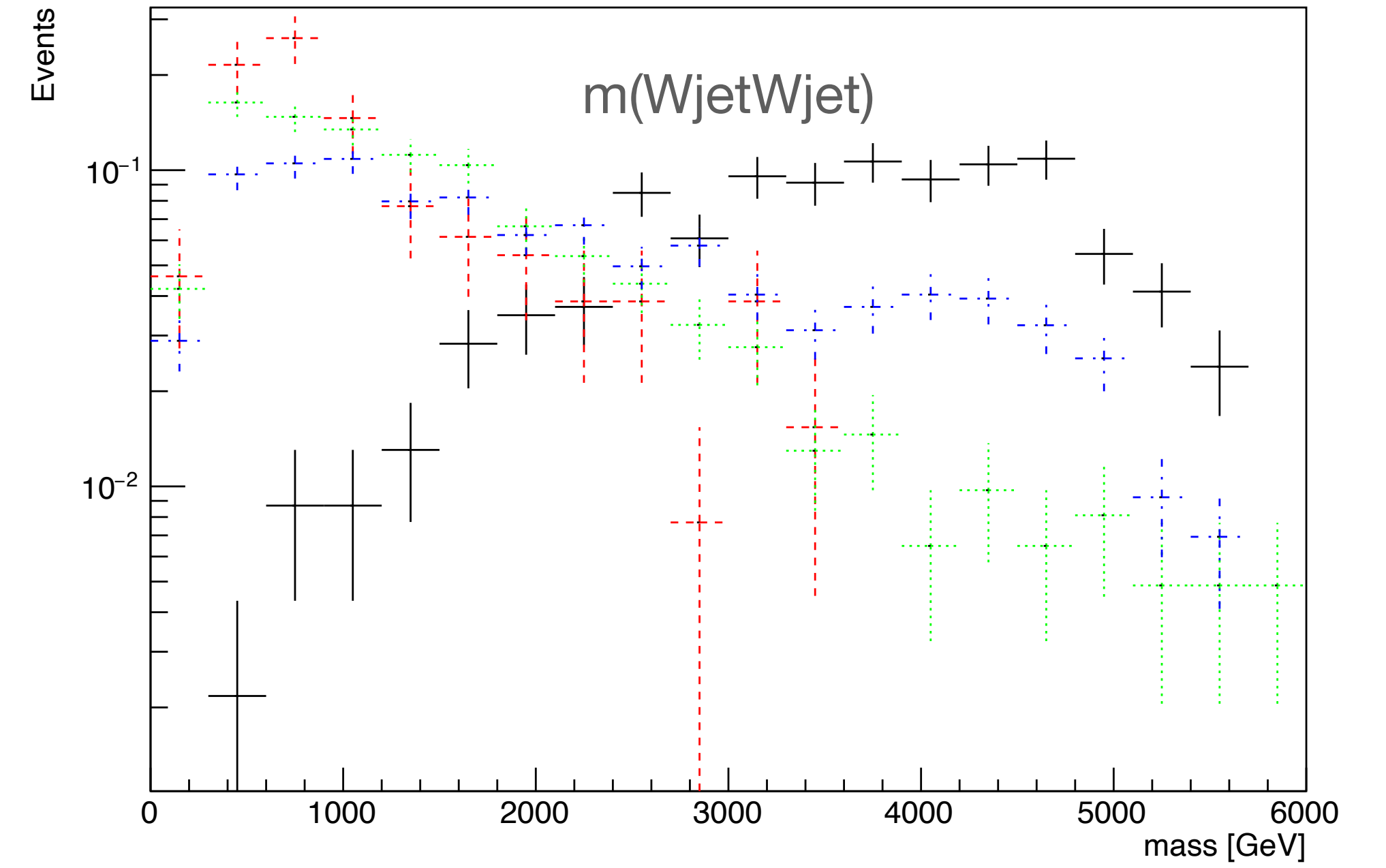
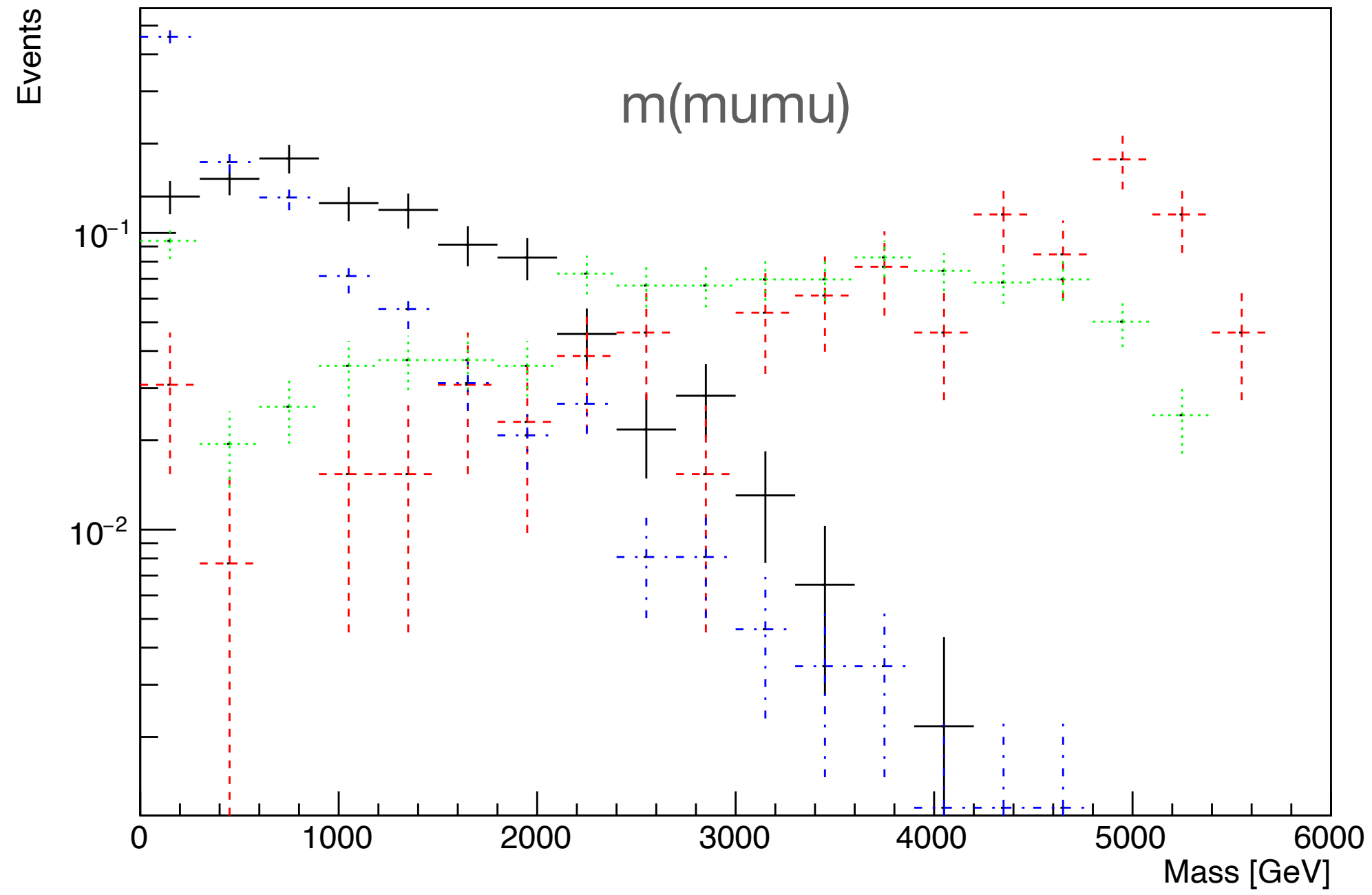
R\_Wjets\_mass\_pairs



Plots for No Selection

- INT+QUAD\_1E-12
- - - INT+QUAD\_1E-14
- ... SM
- . - . Diboson
- . - . Quadboson

# Zmass-Veto Selection



- INT+QUAD
- - - SM
- ... Diboson
- · - · Quadboson