

# Résumé de l'analyse

Top group, Lyon

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## Table des matières

<b>1</b>	<b>Datasets</b>	<b>2</b>
1.1	MC . . . . .	2
1.2	Data . . . . .	2
<b>2</b>	<b>Frit</b>	<b>2</b>
2.1	$m = 750$ GeV . . . . .	2
2.2	$m = 1000$ GeV . . . . .	2
2.3	$m = 1250$ GeV . . . . .	3
2.4	$m = 1500$ GeV . . . . .	3
2.5	Efficacités . . . . .	3
2.5.1	Efficacités de sélection . . . . .	3
2.5.2	Efficacité totales . . . . .	3
<b>3</b>	$\sigma_{ref}$	<b>4</b>
3.1	$m = 750$ GeV . . . . .	4
3.2	$m = 1000$ GeV . . . . .	4
3.3	$m = 1250$ GeV . . . . .	4
3.4	$m = 1500$ GeV . . . . .	5
3.5	Sections efficaces . . . . .	5
<b>4</b>	<b>Erreurs systématiques</b>	<b>5</b>

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4.1	JEC . . . . .	5
4.2	Signal . . . . .	5
4.3	Background . . . . .	6
<b>5</b>	<b>Likelihood scan</b>	<b>7</b>
5.1	$m = 750$ GeV . . . . .	7
5.2	$m = 1000$ GeV . . . . .	8
5.3	$m = 1250$ GeV . . . . .	9
5.4	$m = 1500$ GeV . . . . .	10
5.5	Limites observées . . . . .	10
<b>6</b>	<b>Toy MC</b>	<b>10</b>
6.1	$m = 750$ GeV . . . . .	11
6.2	$m = 1000$ GeV . . . . .	12
6.3	$m = 1250$ GeV . . . . .	13
6.4	$m = 1500$ GeV . . . . .	14
6.5	Limites attendues . . . . .	15
<b>7</b>	<b>Limites</b>	<b>15</b>

# 1 Datasets

## 1.1 MC

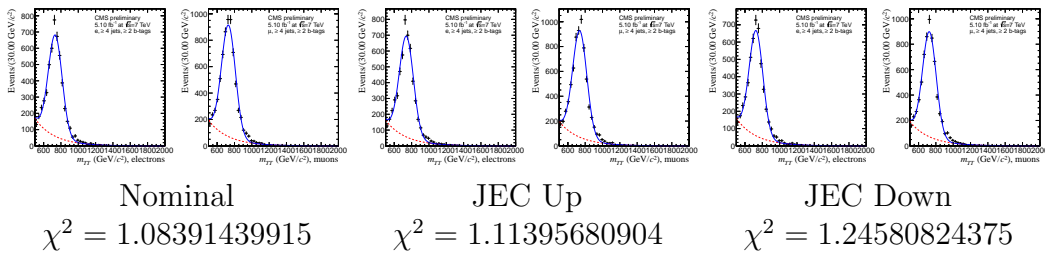
- $m = 500$  GeV : @@m-500-entries@@ entrées.
- $m = 750$  GeV : @@m-750-entries@@ entrées.
- $m = 1000$  GeV : @@m-1000-entries@@ entrées.
- $m = 1250$  GeV : @@m-1250-entries@@ entrées.
- $m = 1500$  GeV : @@m-1500-entries@@ entrées.

## 1.2 Data

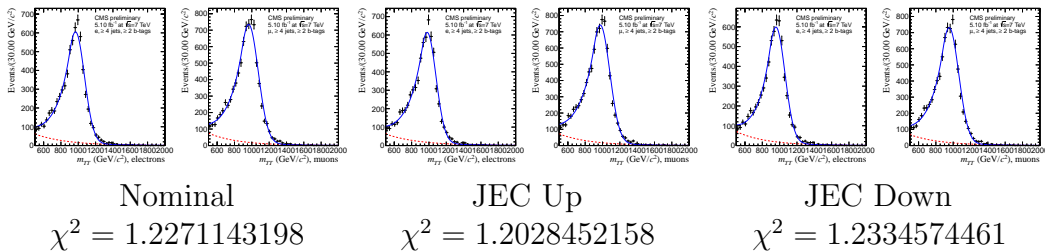
@@data-entries@@ entrées.

# 2 Frit

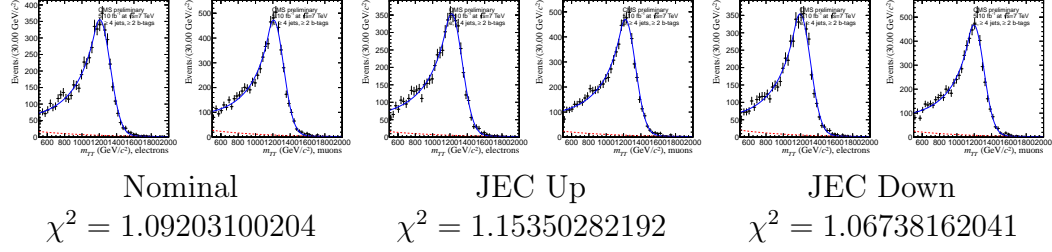
## 2.1 $m = 750$ GeV



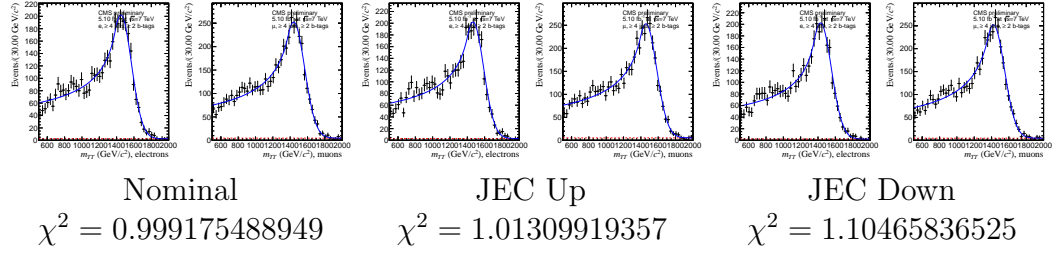
## 2.2 $m = 1000$ GeV



### 2.3 $m = 1250$ GeV



### 2.4 $m = 1500$ GeV



## 2.5 Efficacités

### 2.5.1 Efficacités de sélection

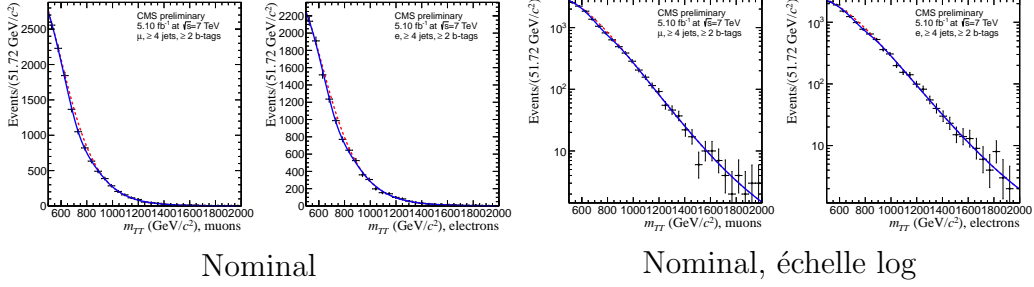
$m_{t\bar{t}}$	750 GeV	1000 GeV	1250 GeV	1500 GeV
$\epsilon(Z'), \text{semi} - \mu$ (%)	$2.75 \pm 0.04$	$3.73 \pm 0.07$	$3.58 \pm 0.09$	$2.94 \pm 0.05$
$\epsilon(Z'), \text{semi} - e$ (%)	$2.01 \pm 0.03$	$2.90 \pm 0.06$	$2.76 \pm 0.08$	$2.35 \pm 0.06$

### 2.5.2 Efficacité totales

$m_{t\bar{t}}$	750 GeV	1000 GeV	1250 GeV	1500 GeV
$\epsilon(Z'), \text{semi-}\mu$	2.11	2.76	2.55	2.08
$\epsilon(Z'), \text{semi-e}$	1.74	2.52	2.39	2.04

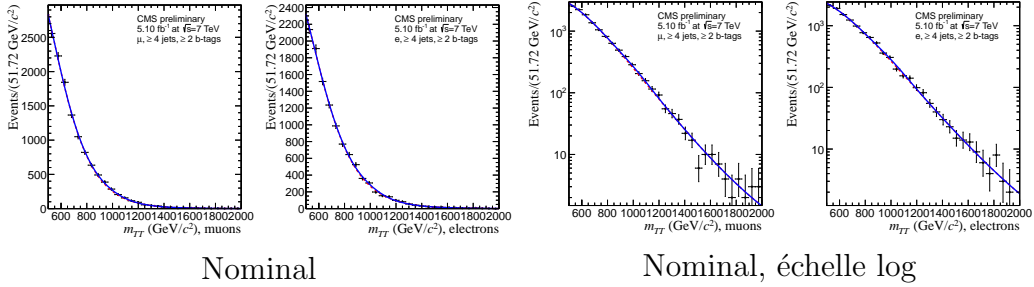
### 3 $\sigma_{ref}$

#### 3.1 $m = 750$ GeV



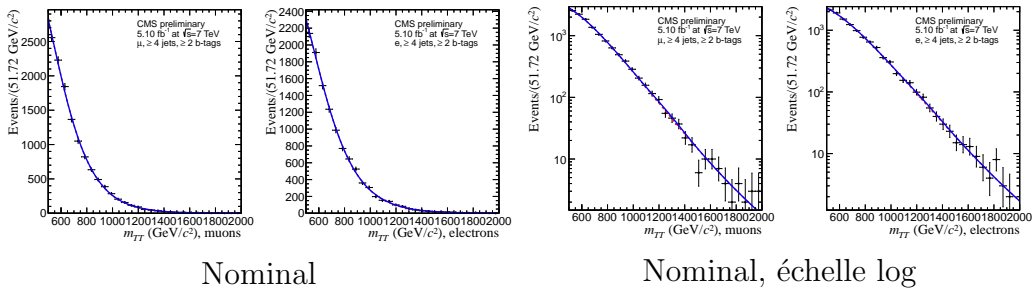
- $\chi^2 = 0.97254472971$
- Statut du fit : OK

#### 3.2 $m = 1000$ GeV



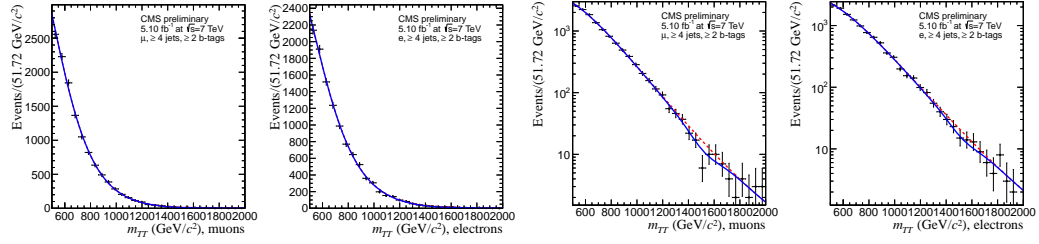
- $\chi^2 = 0.988131582737$
- Statut du fit : OK

#### 3.3 $m = 1250$ GeV



- $\chi^2 = 1.0089353323$
- Statut du fit : OK

### 3.4 $m = 1500 \text{ GeV}$



Nominal

Nominal, échelle log

- $\chi^2 = 0.969866275787$
- Statut du fit : OK

### 3.5 Sections efficaces

$m_{t\bar{t}}$	750 GeV	1000 GeV	1250 GeV	1500 GeV
$\sigma \text{ (pb)}$	-4.58870211453	0.760380954765	0.271851266856	-0.616997357645

## 4 Erreurs systématiques

### 4.1 JEC

$m_{t\bar{t}}$	750 GeV		1000 GeV		1250 GeV		1500 GeV	
	JEC up	JEC down	JEC up	JEC down	JEC up	JEC down	JEC up	JEC down
$\chi^2$	1.0177	0.8681	1.0187	0.8724	1.058	0.9006	1.0194	0.877
Fit	OK	OK	OK	OK	OK	OK	OK	OK
$\sigma \text{ (pb)}$	-4.8423	-4.7122	1.357	1.5029	0.1967	0.1342	-0.5637	-0.6201
$\sigma_{syst} \text{ (pb)}$	0.1309		0.1767		0.1643		0.2563	

### 4.2 Signal

Paramètre	Variation	$\chi^2$	$\sigma \text{ (pb)}$	Statut du fit
$m = 750 \text{ GeV}$				
muon_mean	up	0.9402	-5.4353	OK
	down	0.9382	-5.5468	OK
muon_sigma	up	0.9393	-5.6210	OK
	down	0.9391	-5.3604	OK
muon_alpha	up	0.9392	-5.4970	OK
	down	0.9394	-5.4659	OK
La suite page suivante				

Paramètre	Variation	$\chi^2$	$\sigma$ (pb)	Statut du fit
$\sigma_{syst} = 0.0259$ pb				
$m = 1000$ GeV				
muon_mean	up	0.9363	1.7382	OK
	down	0.9369	1.7338	OK
muon_sigma	up	0.9355	1.8001	OK
	down	0.9374	1.6779	OK
muon_alpha	up	0.9363	1.7125	OK
	down	1.2138	1.7125	OK
$\sigma_{syst} = 0.0379$ pb				
$m = 1250$ GeV				
muon_mean	up	0.9994	0.1623	OK
	down	0.9992	0.2189	OK
muon_sigma	up	0.9994	0.1706	OK
	down	1.0089	0.1420	OK
muon_alpha	up	0.9993	0.1708	OK
	down	0.9992	0.2143	OK
$\sigma_{syst} = 0.2589$ pb				
$m = 1500$ GeV				
muon_mean	up	0.9294	-0.7797	OK
	down	0.9313	-0.8082	OK
muon_sigma	up	0.9293	-0.8010	OK
	down	0.9298	-0.7899	OK
muon_alpha	up	0.9296	-0.7471	OK
	down	0.9293	-0.8524	OK
$\sigma_{syst} = 0.0689$ pb				

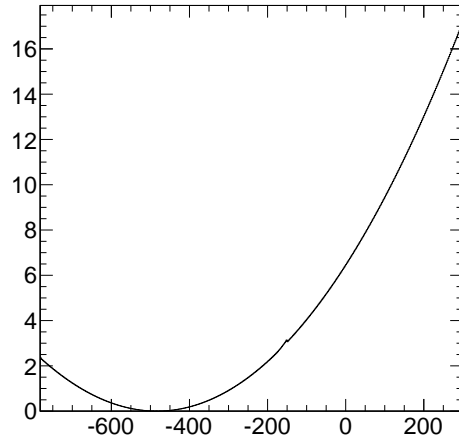
### 4.3 Background

Fonction de bkg	$\chi^2$	$\sigma$ (pb)	Statut du fit
$m = 750$ GeV			
fit_pdf.falt.json	0.9985	-4.8974	OK
$\sigma_{syst} = 0.1091$ pb			
$m = 1000$ GeV			
fit_pdf.falt.json	0.9481	2.1146	OK
$\sigma_{syst} = 0.2175$ pb			
$m = 1250$ GeV			
fit_pdf.falt.json	1.0338	-0.0146	OK
La suite page suivante			

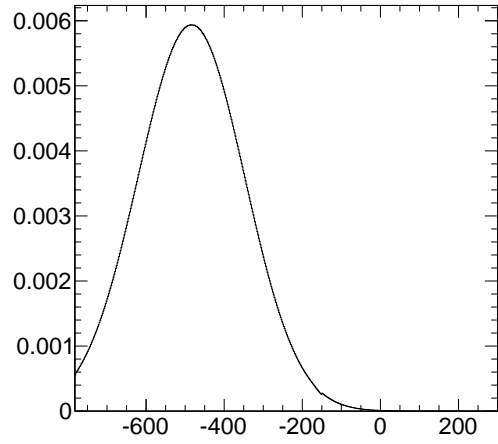
Fonction de bkg	$\chi^2$	$\sigma$ (pb)	Statut du fit
$\sigma_{syst} = 1.0770$ pb			
$m = 1500$ GeV			
fit_pdf_falt.json	0.9292	-0.9582	OK
$\sigma_{syst} = 0.2040$ pb			

## 5 Likelihood scan

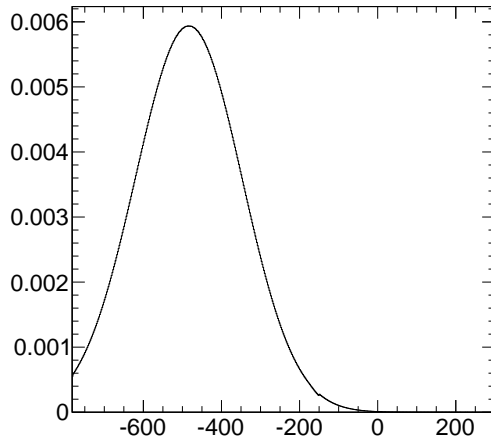
### 5.1 $m = 750$ GeV



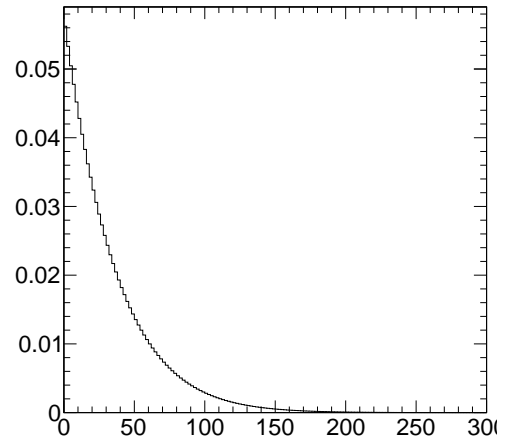
Likelihood scan



PDF scan

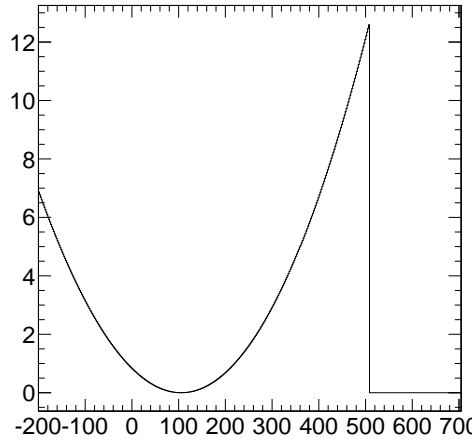


PDF scan + systématiques

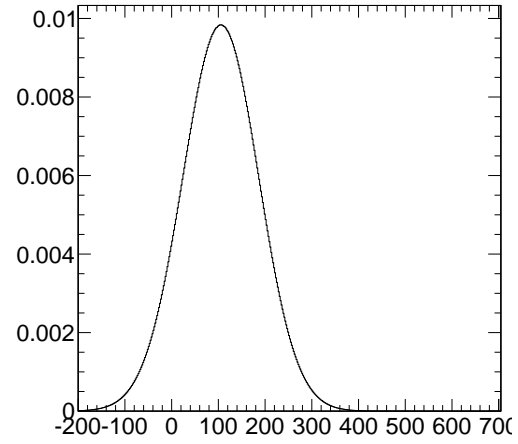
PDF scan + systématiques pour  
 $N_{sig} > 0$



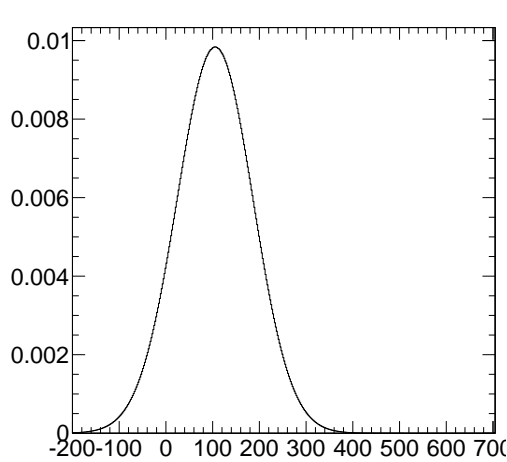
## 5.2 $m = 1000$ GeV



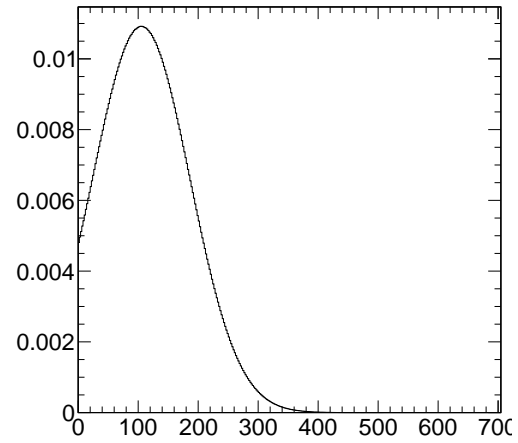
Likelihood scan



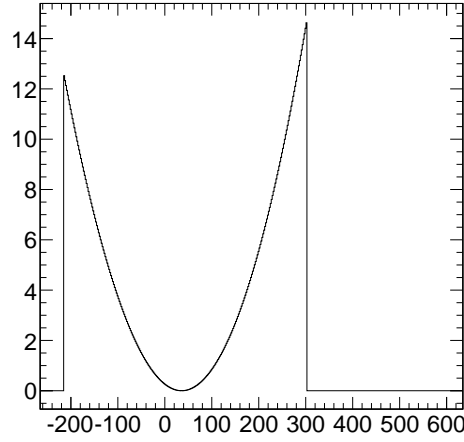
PDF scan



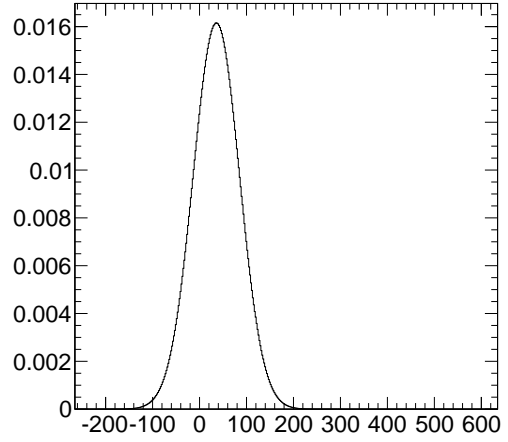
PDF scan + systématiques


 PDF scan + systématiques pour  
 $N_{sig} > 0$

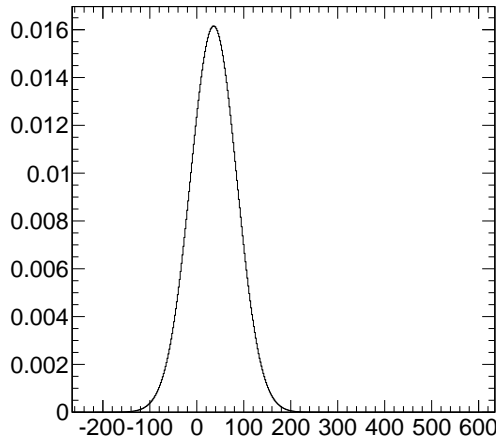
### 5.3 $m = 1250$ GeV



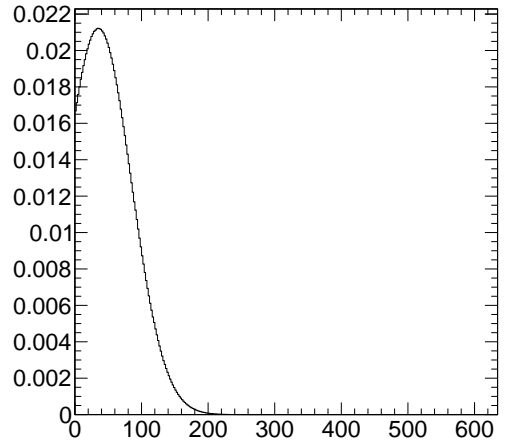
Likelihood scan



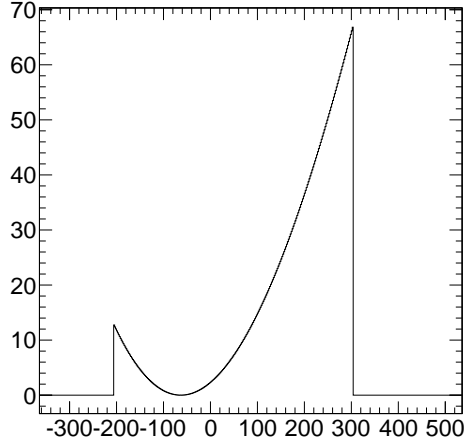
PDF scan



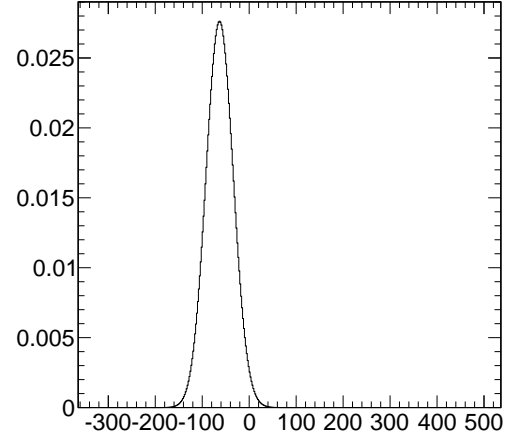
PDF scan + systématiques


 PDF scan + systématiques pour  
 $N_{sig} > 0$

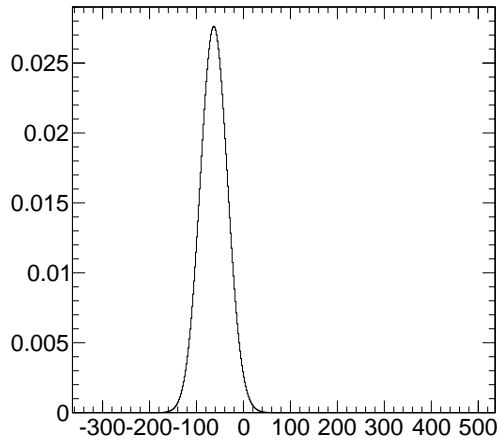
### 5.4 $m = 1500$ GeV



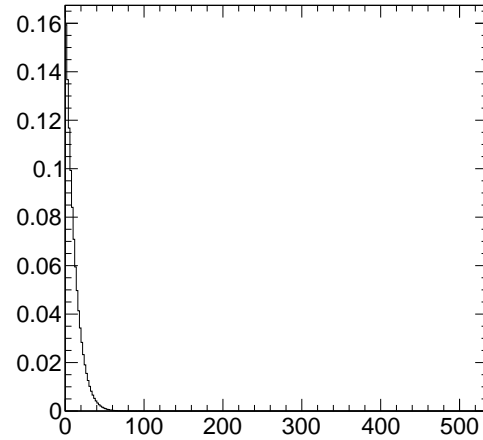
Likelihood scan



PDF scan



PDF scan + systématiques

PDF scan + systématiques pour  
 $N_{sig} > 0$ 

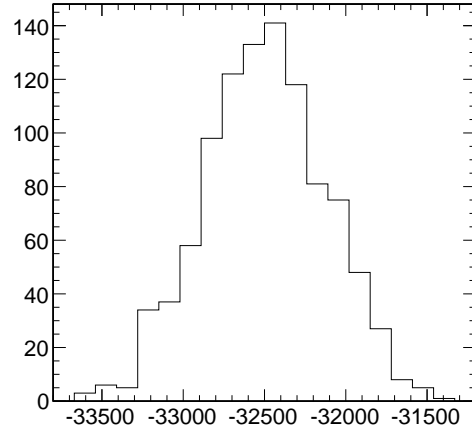
### 5.5 Limites observées

$m_{t\bar{t}}$	750 GeV	1000 GeV	1250 GeV	1500 GeV
Limite observée (pb)	0.9039	1.7578	0.9653	0.2886

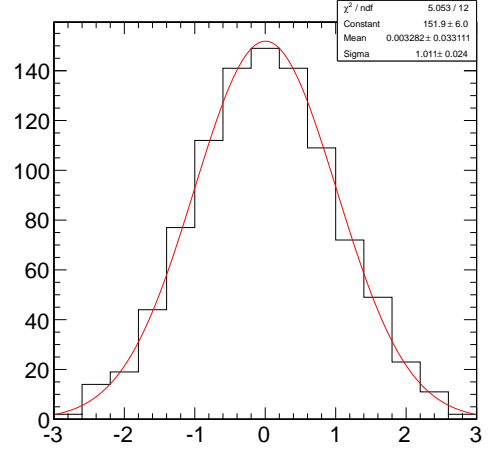
## 6 Toy MC

- Nombre de toys par masse : 1000
- Nombre de jobs par masse : 100
- Nombre de toys par jobs : 10

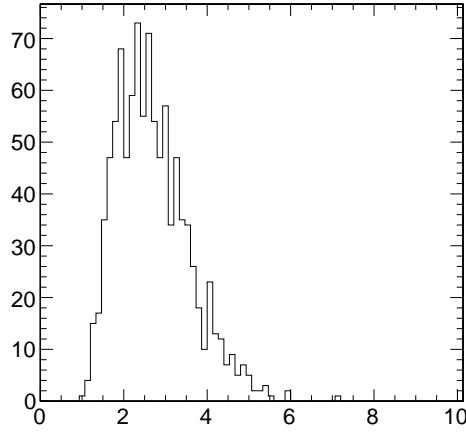
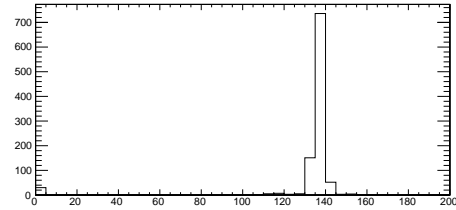
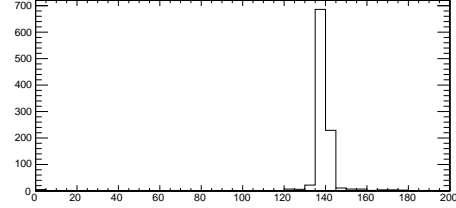
## 6.1 $m = 750$ GeV



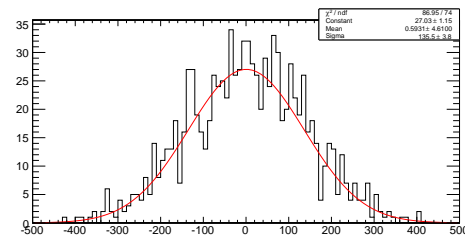
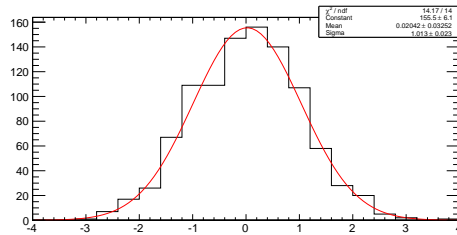
Nll Toy exp

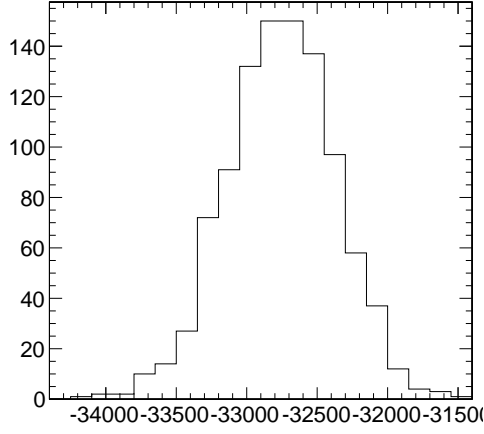


Pull

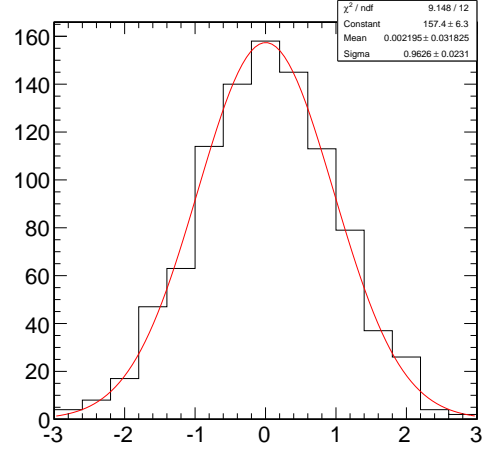
Limite  $Z'$ 

Erreur sur limite

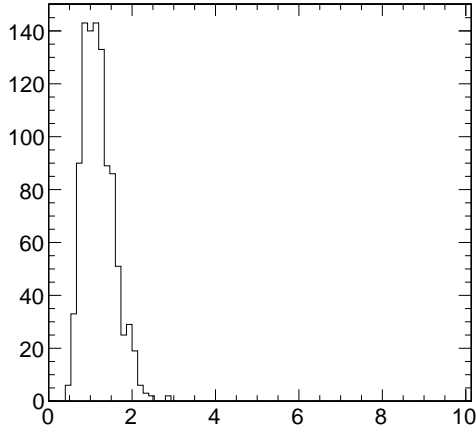
Plots  $e \mu$

6.2  $m = 1000$  GeV

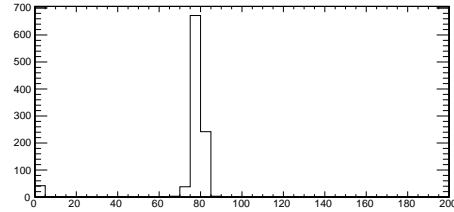
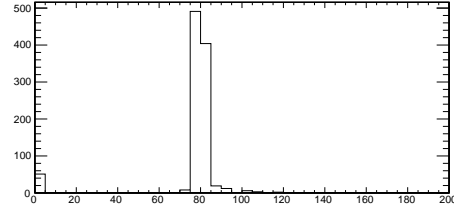
Nll Toy exp



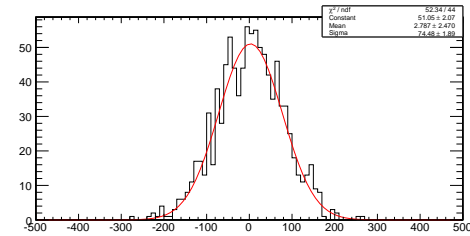
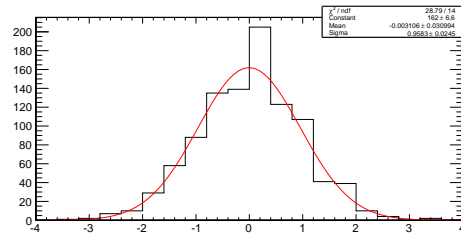
Pull



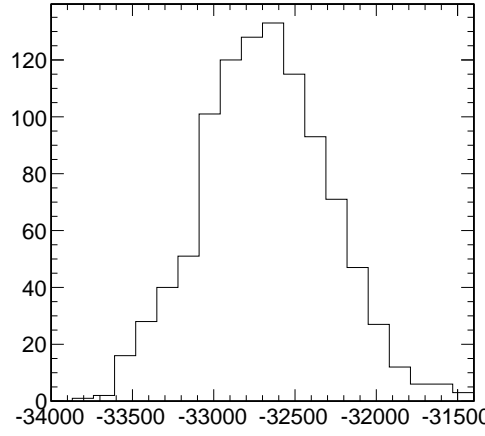
Limite Z'



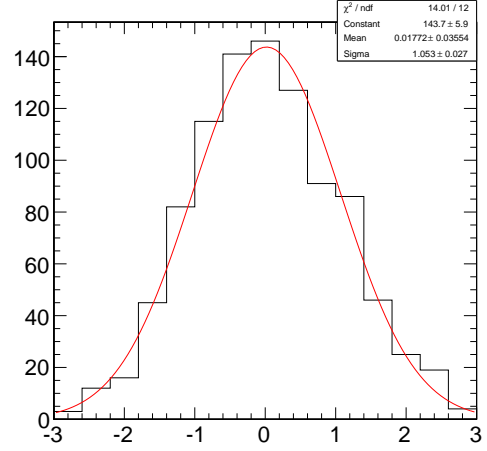
Erreur sur limite

Plots  $e \mu$

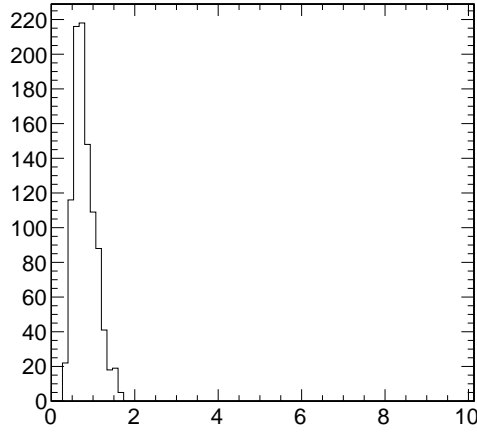
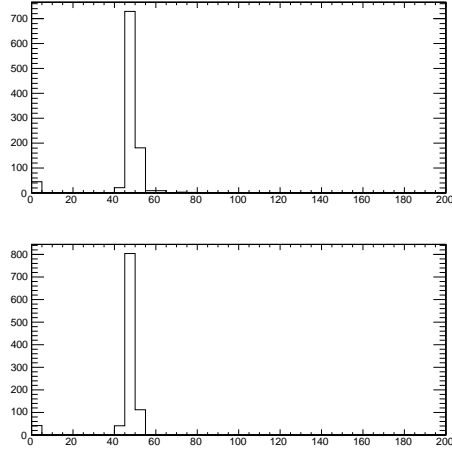
### 6.3 $m = 1250$ GeV



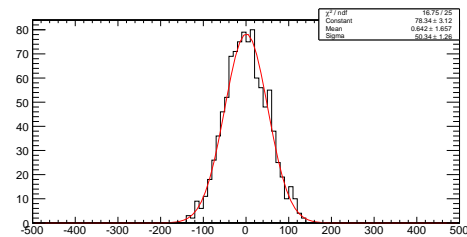
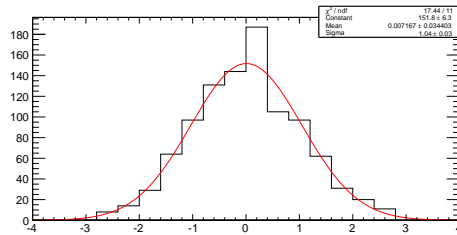
Nll Toy exp

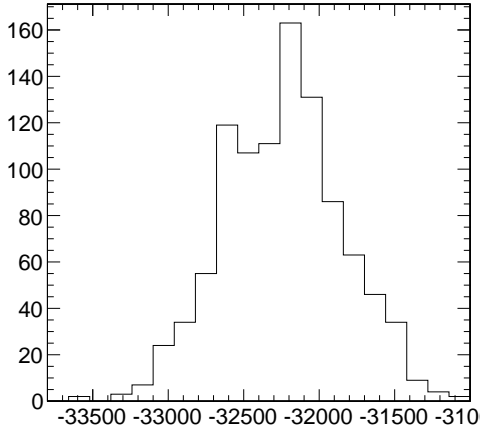


Pull

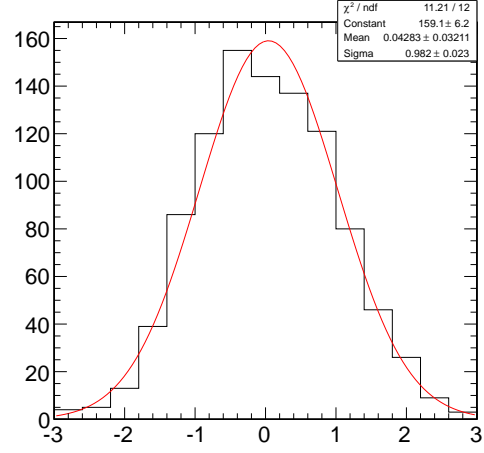
Limite  $Z'$ 

Erreur sur limite

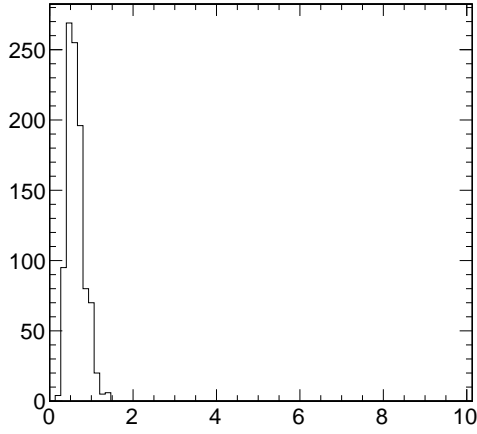
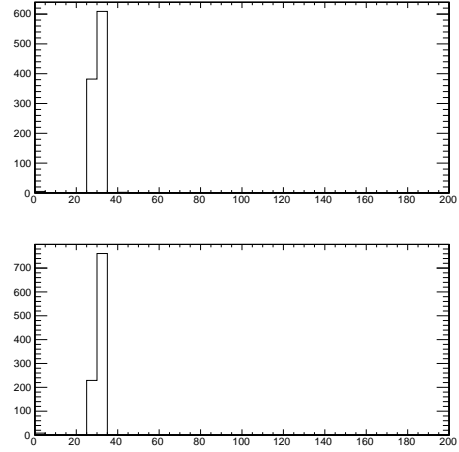
Plots  $e\mu$

6.4  $m = 1500$  GeV

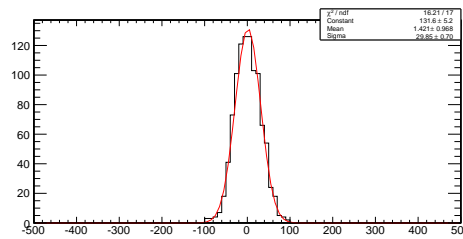
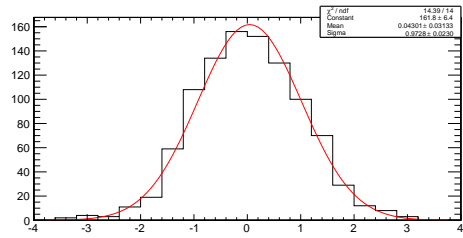
Nll Toy exp



Pull

Limite  $Z'$ 

Erreur sur limite

Plots  $e \mu$

## 6.5 Limites attendues

$m_{t\bar{t}}$	750 GeV	1000 GeV	1250 GeV	1500 GeV
Limite attendue (pb)	2.5803	1.1487	0.756	0.6024
Bande d'exclusion (68%) (pb)	+0.9648 -0.7457	+0.4156 -0.3198	+0.3274 -0.209	+0.2326 -0.1721
Bande d'exclusion (95%) (pb)	+2.1664 -1.2077	+0.9004 -0.5386	+0.7033 -0.3525	+0.5043 -0.3062

## 7 Limites

$m_{t\bar{t}}$	750 GeV	1000 GeV	1250 GeV	1500 GeV
Limite observée (pb)	0.9039	1.7578	0.9653	0.2886
Limite attendue (pb)	2.5803	1.1487	0.756	0.6024
Bande d'exclusion (68%) (pb)	+0.9648 -0.7457	+0.4156 -0.3198	+0.3274 -0.209	+0.2326 -0.1721
Bande d'exclusion (95%) (pb)	+2.1664 -1.2077	+0.9004 -0.5386	+0.7033 -0.3525	+0.5043 -0.3062

