



CMS Experiment at the LHC, CERN

Data recorded: 2011-May-25 08:00:19 229673 GMT(10:00:19 CEST)

Run / Event: 165633 / 394010457

Resultados del ejercicio W/Z



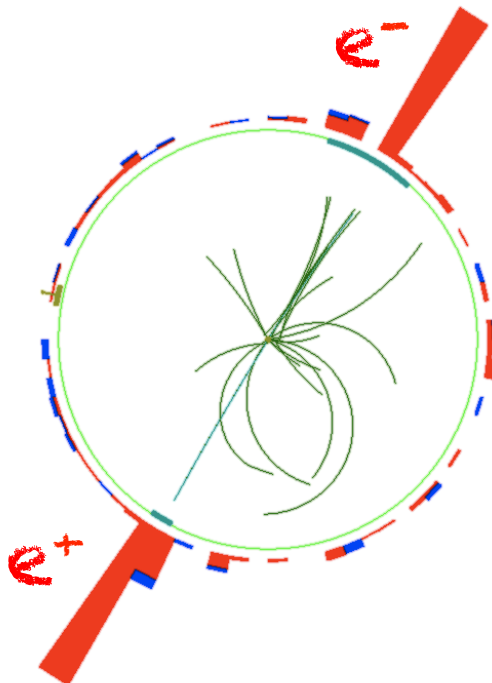
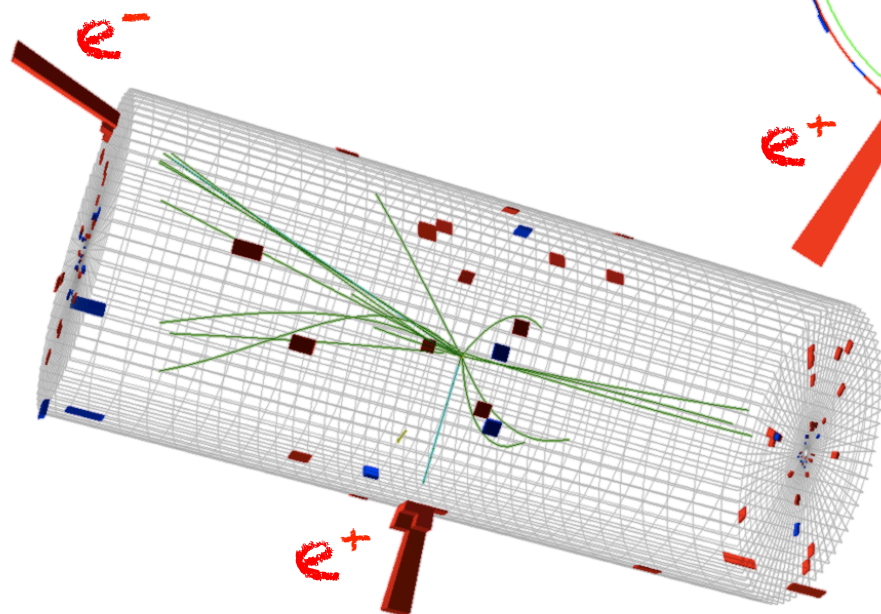
Pablo García Abia (CIEMAT)

Programa español para profesores, CERN, 25 Junio 2015



CMS Experiment at LHC, CERN
Run 133877, Event 28405693
Lumi section: 387
Sat Apr 24 2010, 14:00:54 CEST

Electrons $p_T = 34.0, 31.9$ GeV/c
Inv. mass = 91.2 GeV/c²

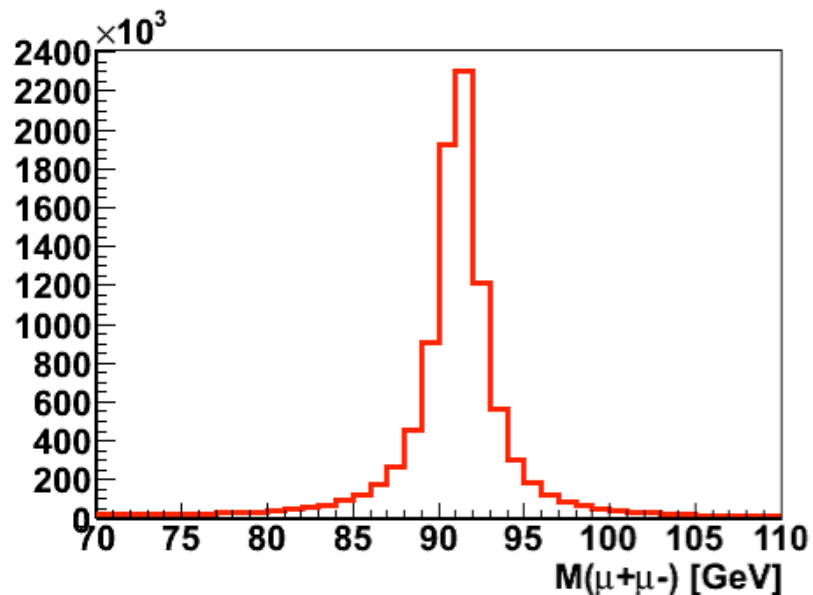


Candidato a Z:

2 *leptones*
cargados del
mismo sabor
(e, μ) y carga
opuesta.

Balanceados en
el plano
transverso.

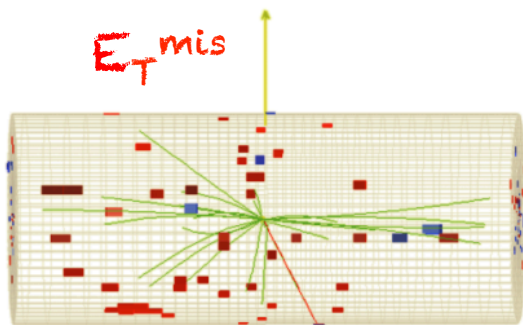
$$pp \rightarrow Z+X \rightarrow e^+e^-+X$$





CMS Experiment at LHC, CERN
 Run 133875, Event 1228182
 Lumi section: 16
 Sat Apr 24 2010, 09:08:46 CEST

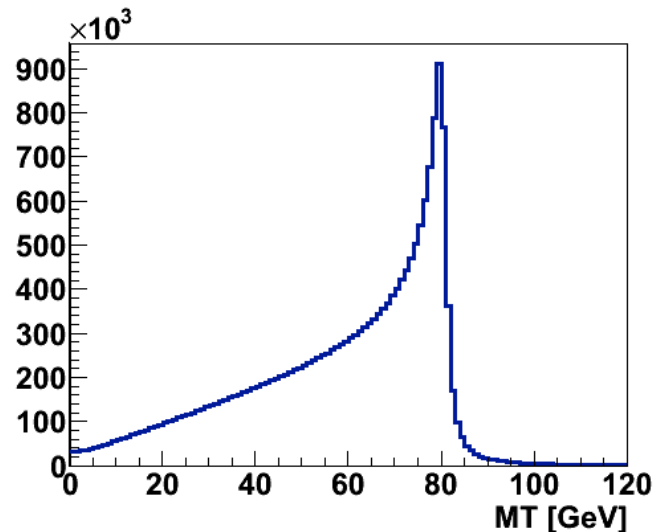
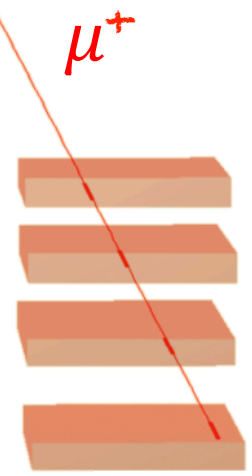
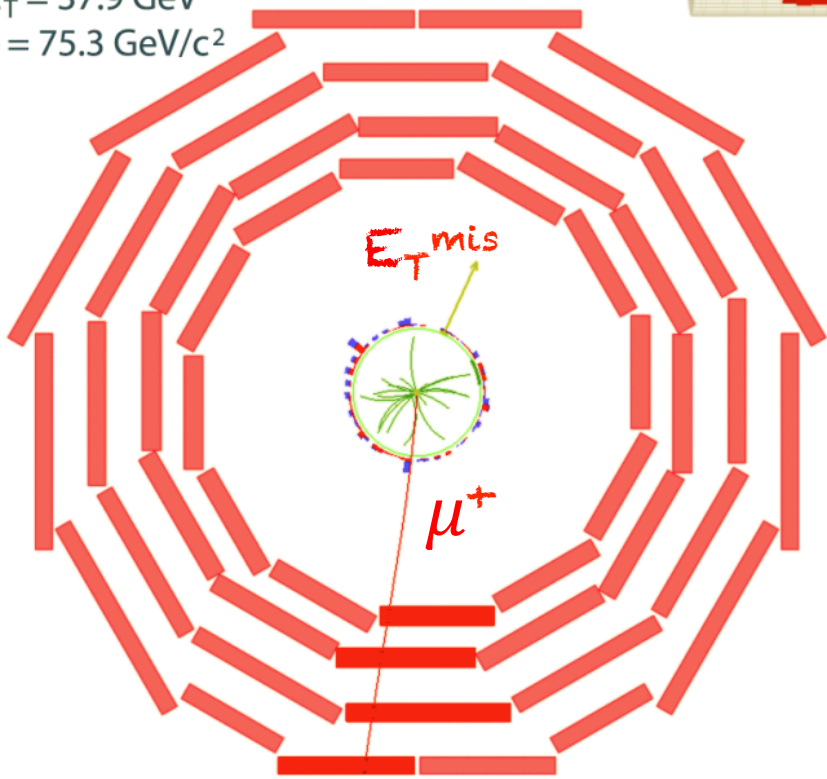
Muon $p_T = 38.7$ GeV/c
 $ME_T = 37.9$ GeV
 $M_T = 75.3$ GeV/c²



Candidato a W:

1 *Leptón cargado* (e, μ) y un *neutrino* (E_T^{mis}).

El neutrino se manifiesta por la *falta aparente de conservación de energía-momento*.



Números de W^\pm/Z , e^\pm/μ^\pm

Group	Muon	Electron	W	W-	W+	Z	Higgs	Zoo	Total
1	14	14	0	7	9	12	1	0	29
2	19	17	0	12	14	10	0	0	36
3	45	41	0	24	39	23	2	12	100
4	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0
6	46	41	0	27	34	26	1	12	100
7	30	26	0	15	19	22	3	0	59
8	7	7	0	5	5	4	1	0	15
9	14	8	0	10	9	3	1	2	25
10	0	0	0	0	0	0	0	0	0

grupo 1: 165

grupo 2: 199

total: 364

Resultados

Total:

Muon	Electron	W	W-	W+	Z	Higgs	Zoo	Sum	e/mu	W+/W-
175	154	0	100	129	100	9	26	364	0.88	1.29

Resultados

Total:

Muon	Electron	W	W-	W+	Z	Higgs	Zoo	Sum	e/mu	W+/W-
175	154	0	100	129	100	9	26	364	0.88	1.29

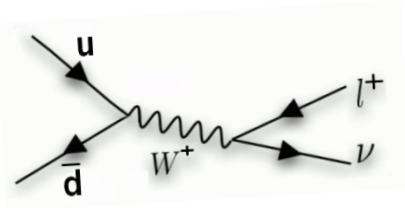
$$e/\mu = 0.88$$

$$\text{CMS: } e/\mu = 1$$

$$W^+/W^- = 1.29$$

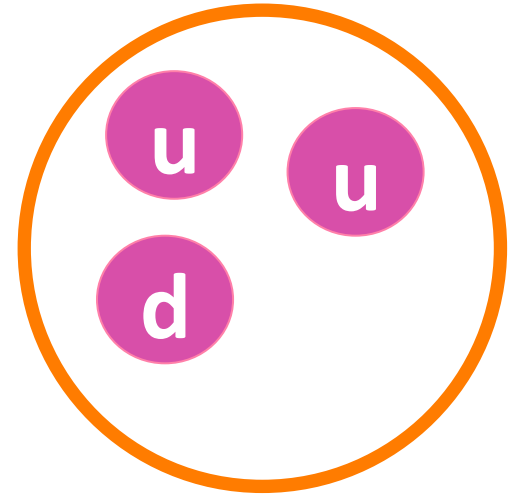
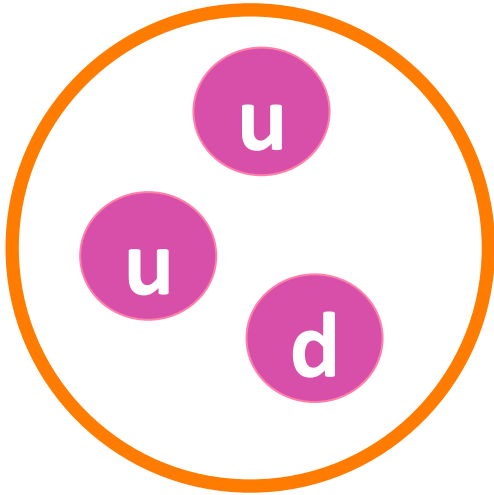
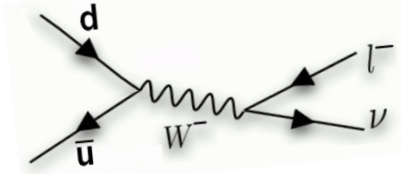
$$\text{CMS: } W^+/W^- \approx 1.60$$

Asimetría en la producción de W^\pm

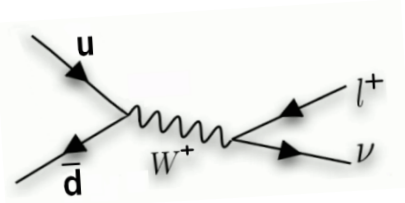


$$u\bar{d} \rightarrow W^+$$

$$\bar{u}d \rightarrow W^-$$

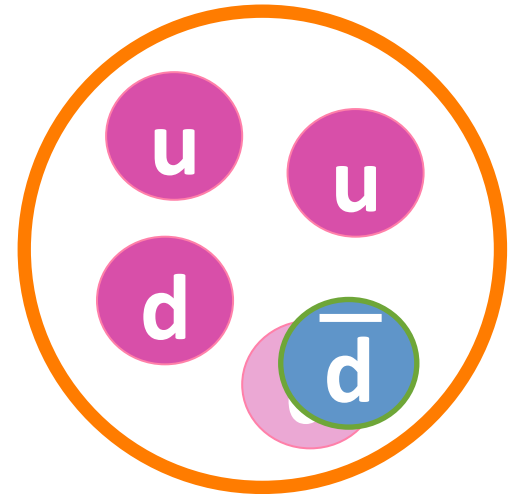
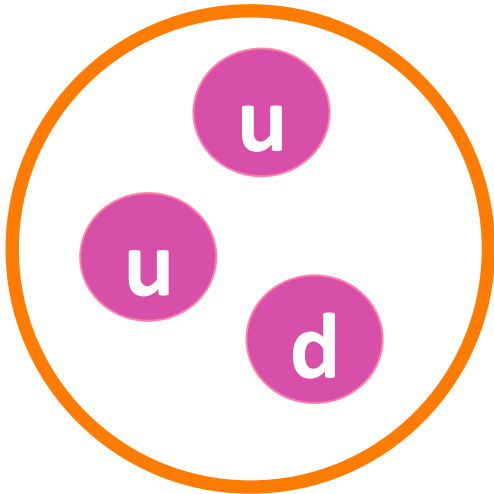
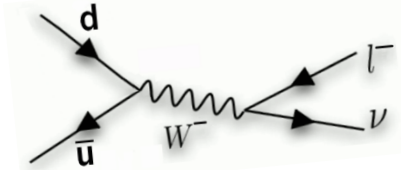


Asimetría en la producción de W^\pm

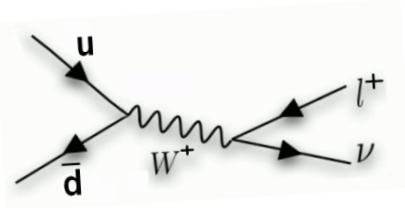


$$u\bar{d} \rightarrow W^+$$

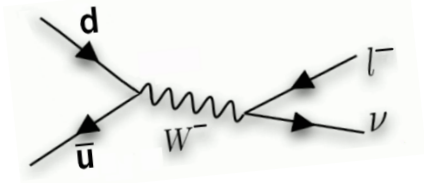
$$\bar{u}d \rightarrow W^-$$



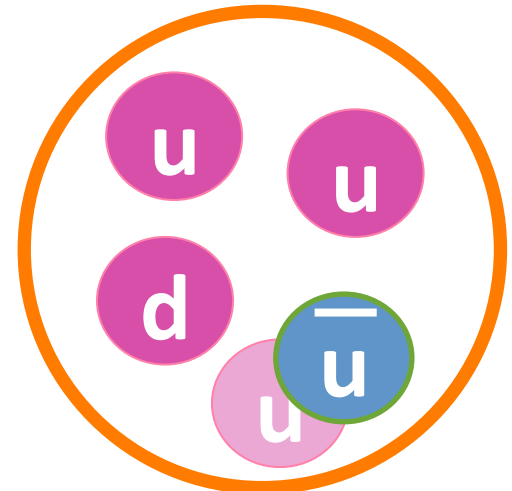
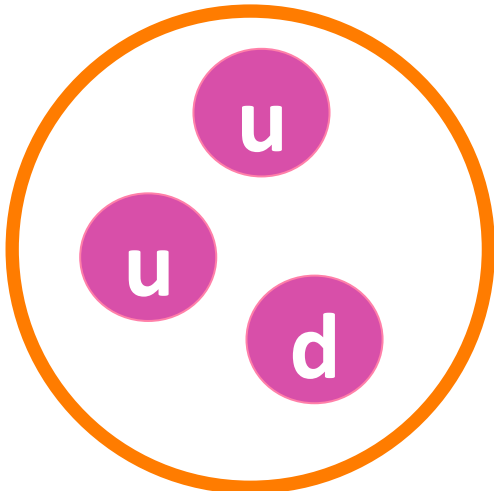
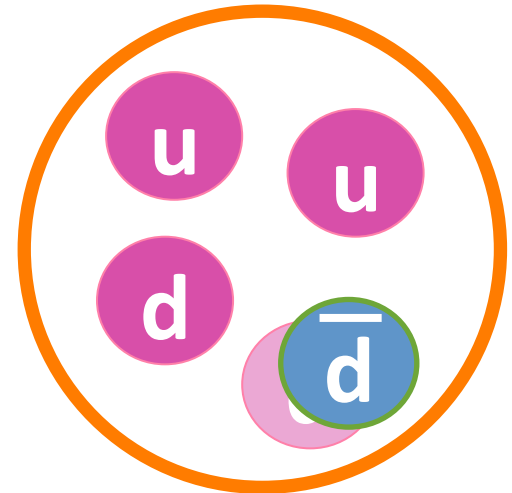
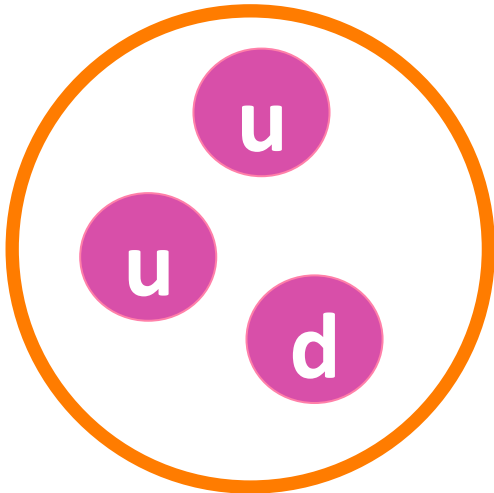
Asimetría en la producción de W^\pm



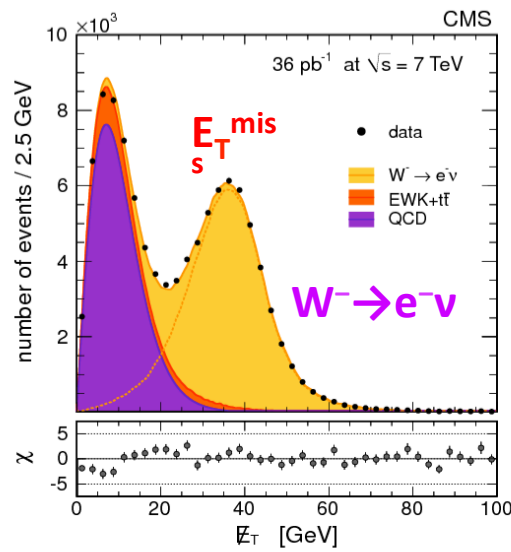
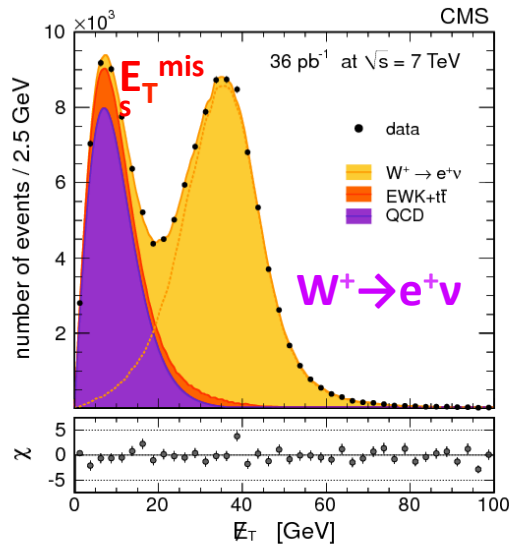
$$u\bar{d} \rightarrow W^+$$



$$\bar{u}d \rightarrow W^-$$

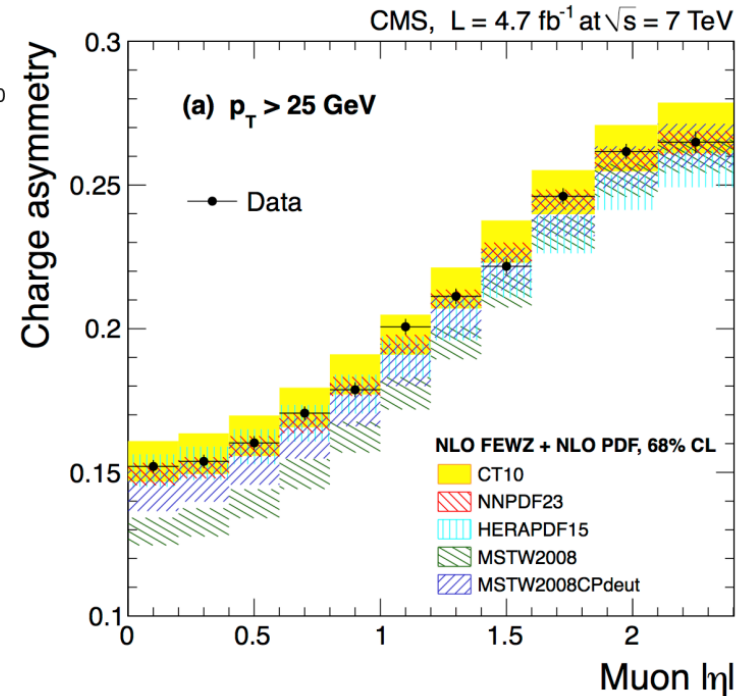
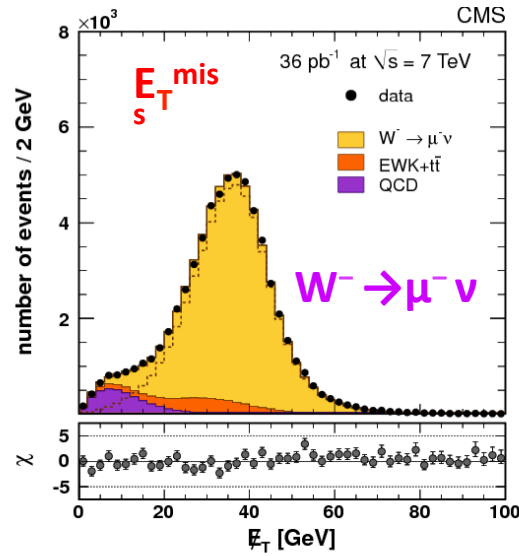
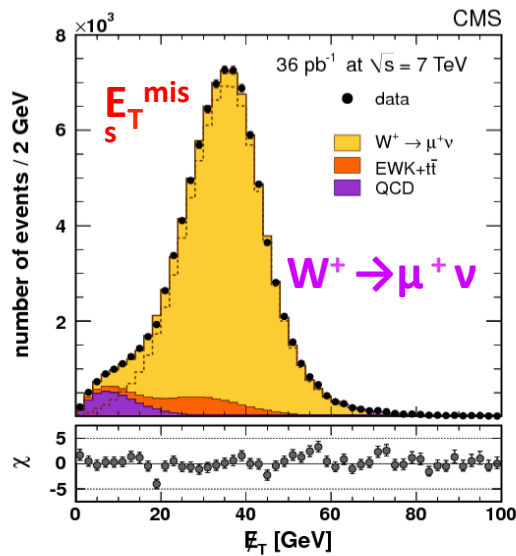


Asimetría en la producción de W^\pm

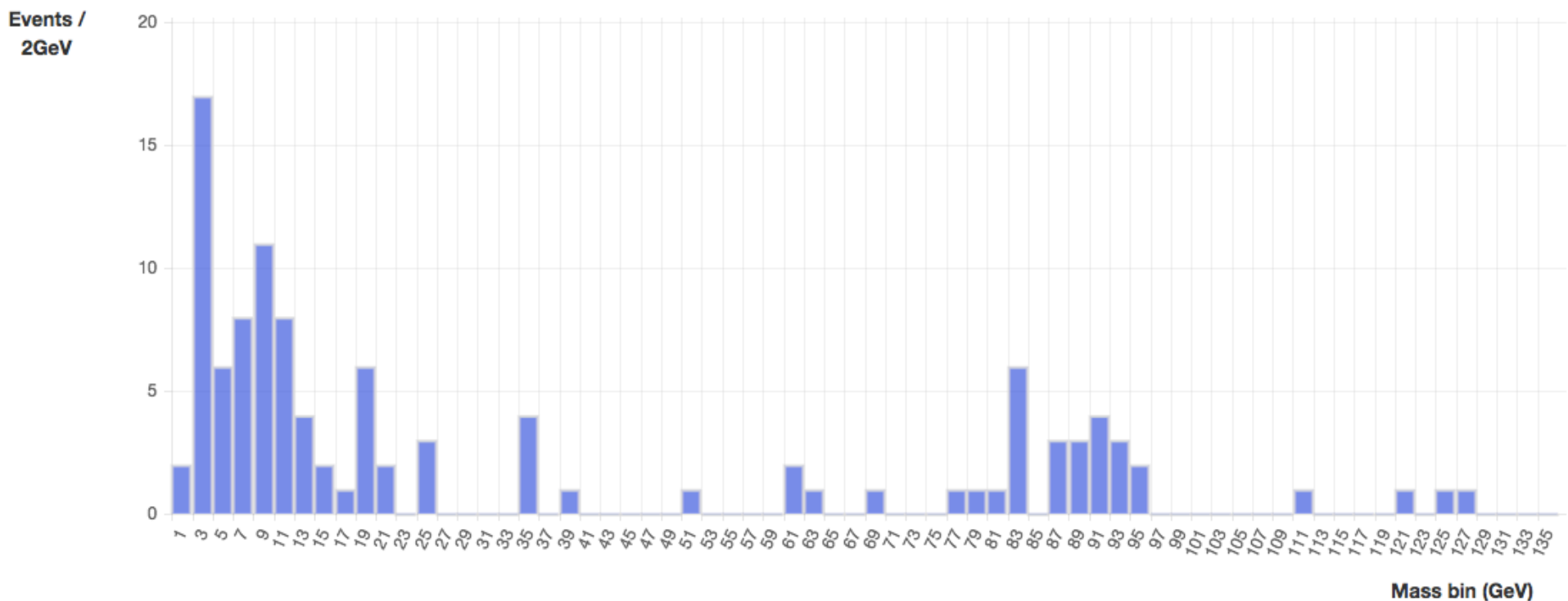


CMS: $A = 0.23$

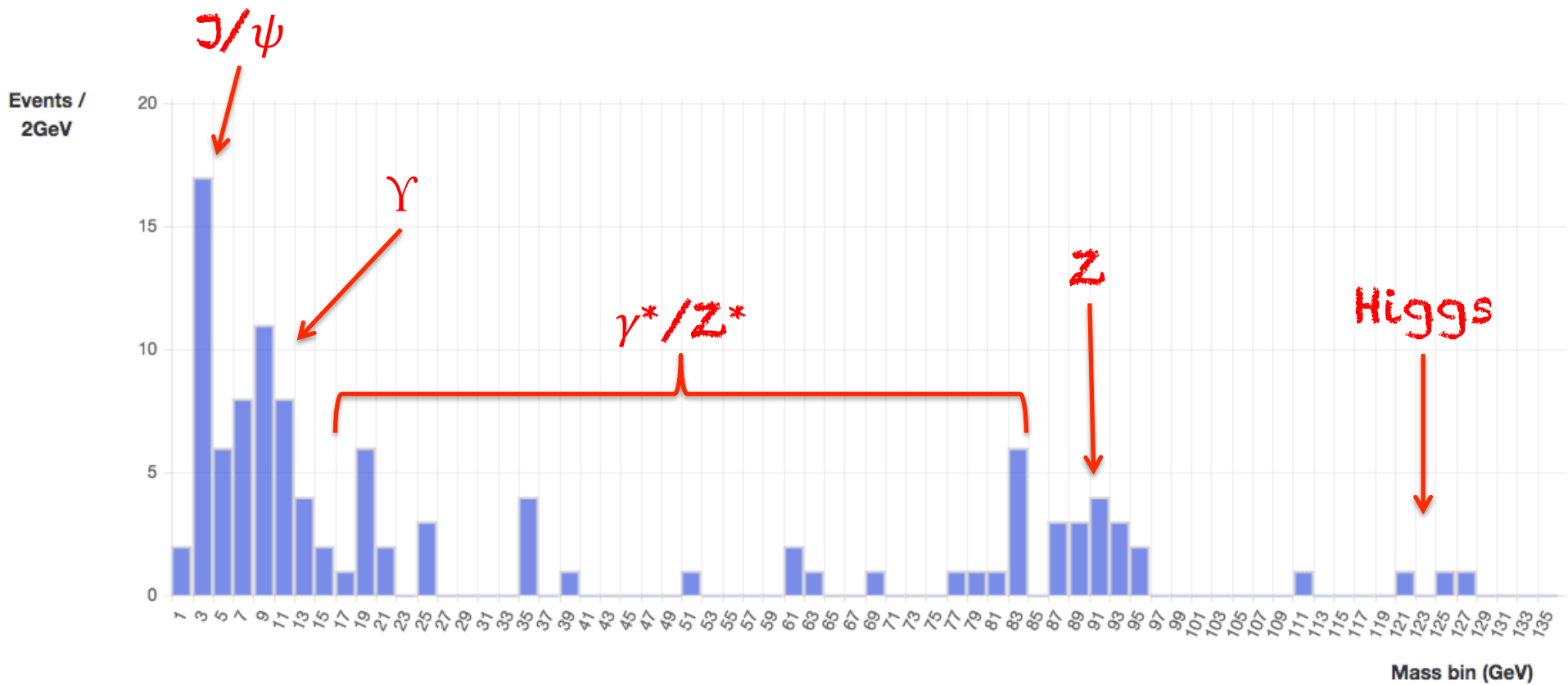
SLTP: $A = 0.13$



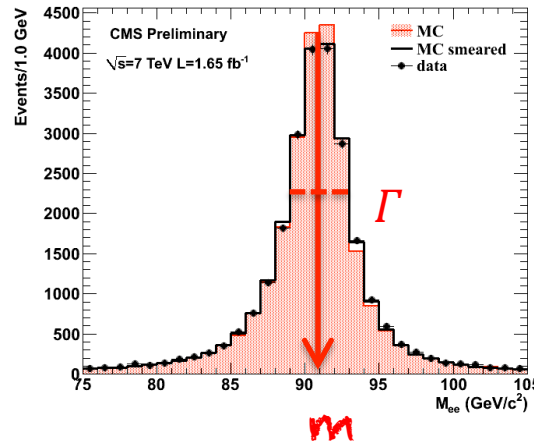
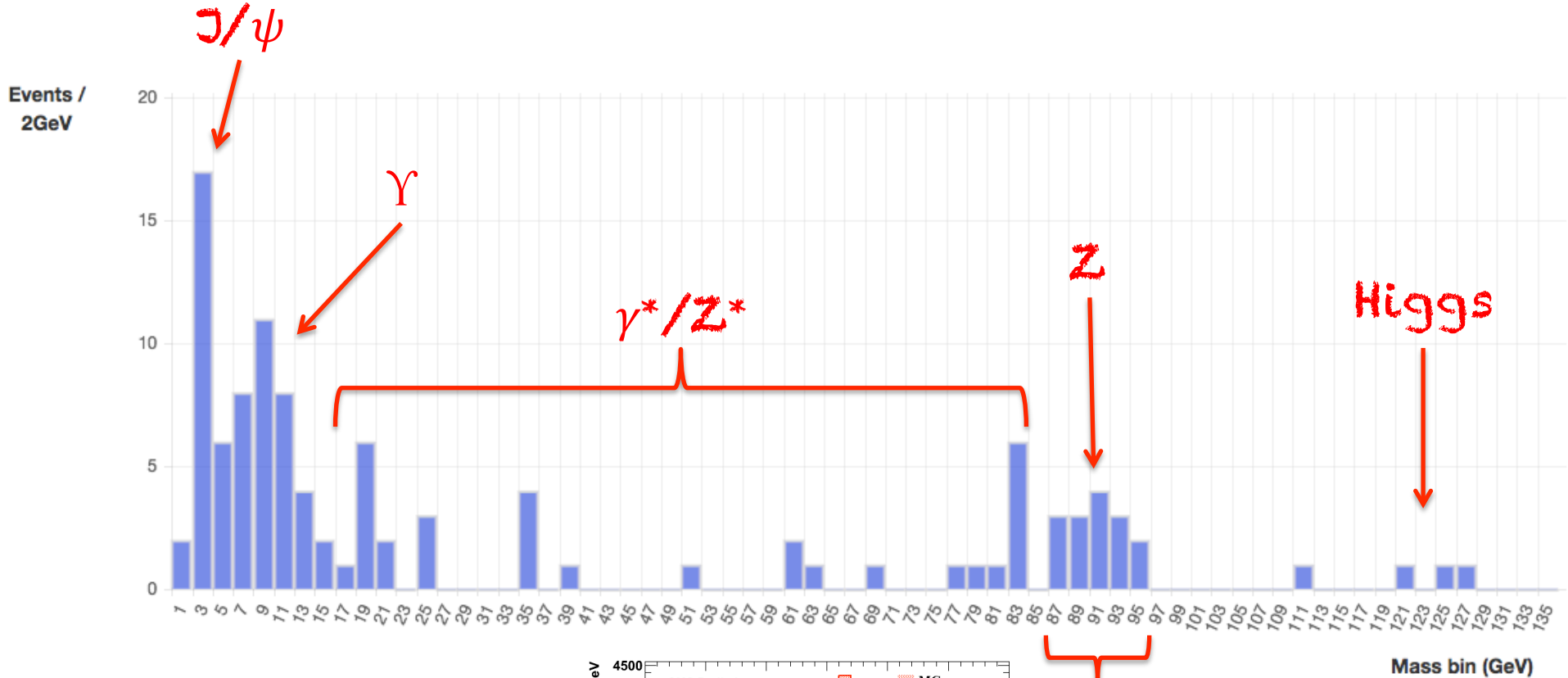
Espectro de masa de e^+e^- y $\mu^+\mu^-$



Espectro de masa de e^+e^- y $\mu^+\mu^-$



Espectro de masa de e^+e^- y $\mu^+\mu^-$

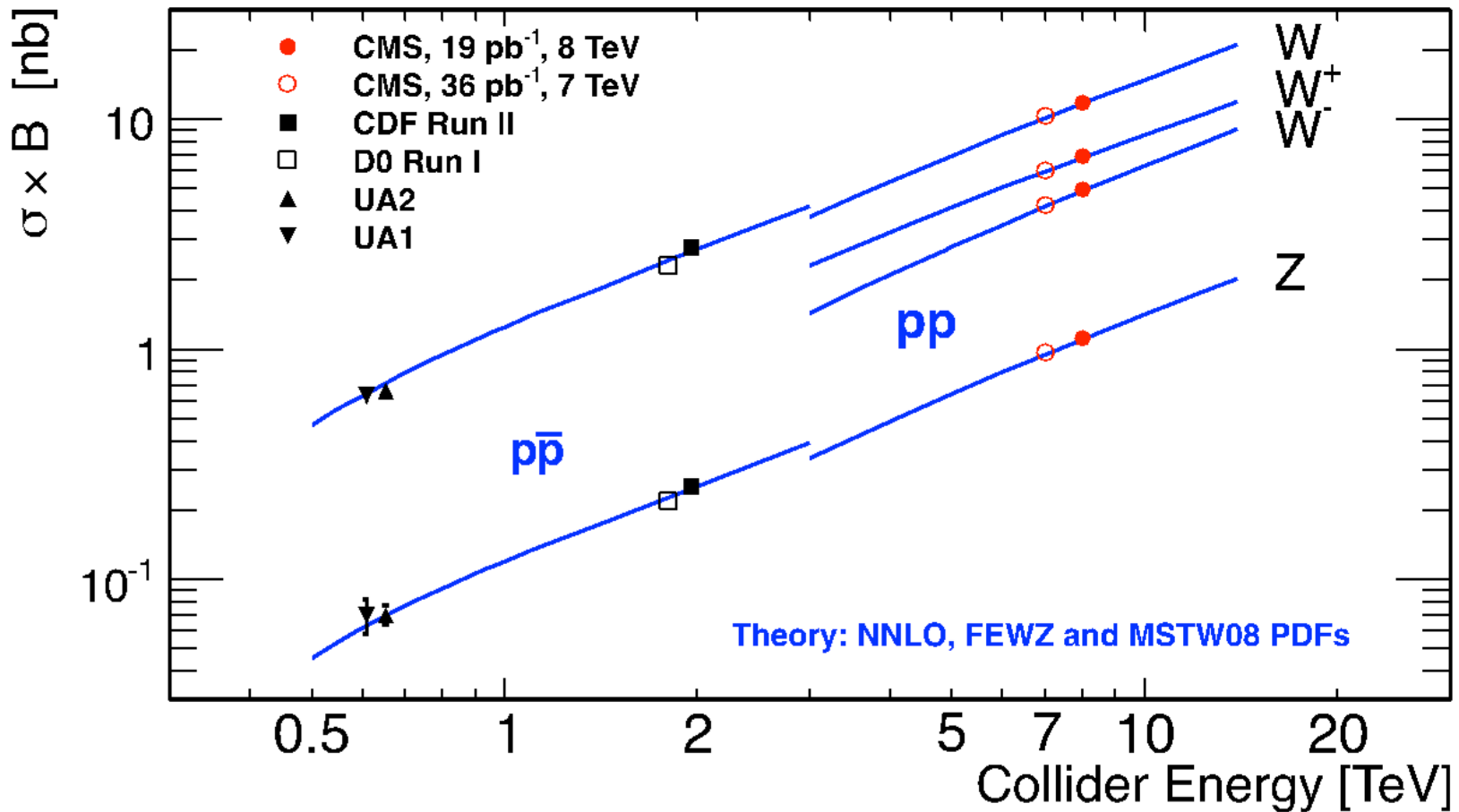


15

$$W/Z \approx \sigma(W)/\sigma(Z)$$

CMS: $W/Z \approx 12$

SLTP: $W/Z \approx 15.3$ (229/15)



!!! FELICIDADES SLTP 2015 !!!

