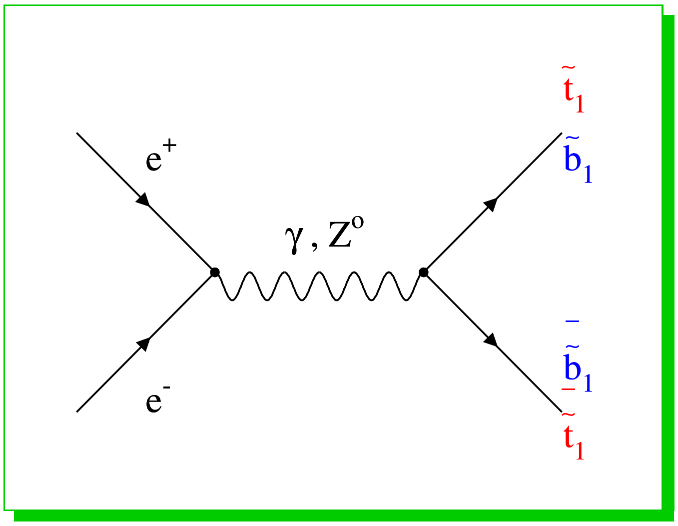
Introduction

Squark Searches from $\sqrt{s} = 189$ to 208 GeV



$$\tilde{t}_1 \rightarrow c\tilde{\chi}_1^0$$
$$\tilde{b}_1 \rightarrow b\tilde{\chi}_1^0$$

2 acoplanar jets + missing energy

Outline :

- **Final results for Moriond**

New things

2000 Data:

	$\sqrt{s}$	$\mathcal{L}$	$\langle\sqrt{s}\rangle$	MC samples
window 1	C1 $\leq$ 205.75	78.08	204.8	204
window 2	C1 $\in$]205.75,207.5]	78.49	206.6	206
window 3	C1 $>$ 207.5	7.28	208.1	208
window 4	S1 All	60.6	206.6	206.7

- 2000 S1 data (and MC) are analysed without any changed in the squark analysis.
- Squark signal with processing S1 at 206 GeV available
- PYTHIA 6.143 used to evaluate the hadronic $\gamma\gamma$ background from 189 to 208 GeV.
- For each analysis (1998, 1999, 2000 C1 and 2000 S1), the cut on the neural network output is performed at the highest $1 - CL_s$ expected value.
- Systematics: introduce a 15% relative systematic error on hadronic $\gamma\gamma$ coming from TWOGAM vs PYTHIA difference at preselection level.

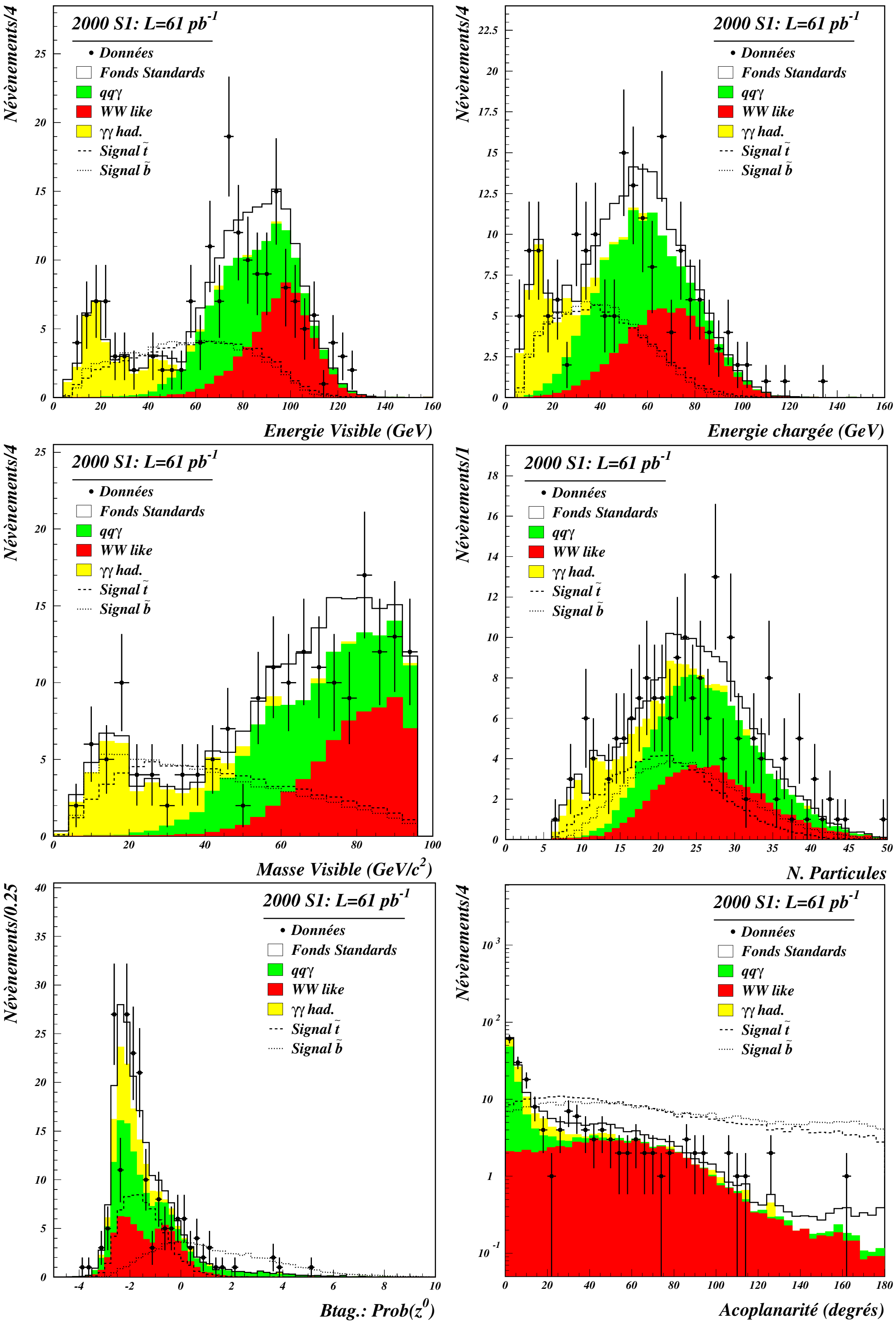
2000 S1 data

	Sbottom à $\sqrt{s}$ =206 GeV					
Coupures	(100,00)		(90,80)		(90,85)	
	A1	S1	A1	S1	A1	S1
DELANA	99,9	99,8	82,3	81,1	24,9	23,0
N_{TPC}	98,6	97,6	77,4	70,9	14,8	13,1
$E_{STIC}/E_{vis.}$	96,2	94,2	69,4	64,0	12,1	11,7
θ_{thrust}	85,9	84,8	65,2	60,0	11,9	11,1
% bonnes traces	85,4	84,0	64,6	59,0	11,9	11,0
P_{TPC}	83,3	78,2	63,5	55,3	11,1	10,0
$N_{cha.}$	83,1	77,9	62,9	55,0	10,7	9,8
$E^{max.}_{neu.}$	82,9	77,4	62,9	55,0	10,7	9,8
$P^{mis.}_{t}$	82,5	77,1	51,9	46,2	0,0	0,2
$\theta_{P_{mis.}}$	79,3	73,3	51,8	46,1	0,0	0,2
$E_{40^0}/E_{vis.}$	72,5	64,6	47,3	42,1	0,0	0,0
$M_{vis.}$	69,1	62,5	47,3	42,1	0,0	0,0
Herméticité	69,1	62,2	47,2	41,8	0,0	0,0

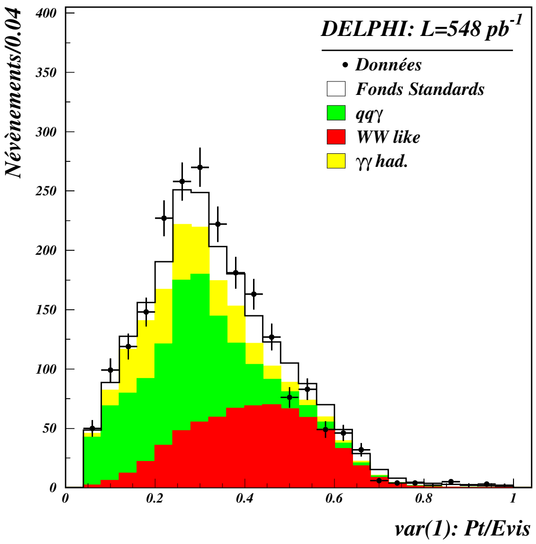
Table 1:

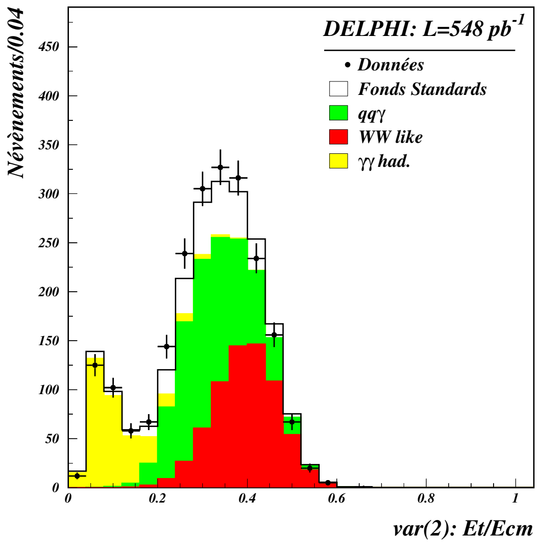
- **Lost of efficiency around 15% (relative)**

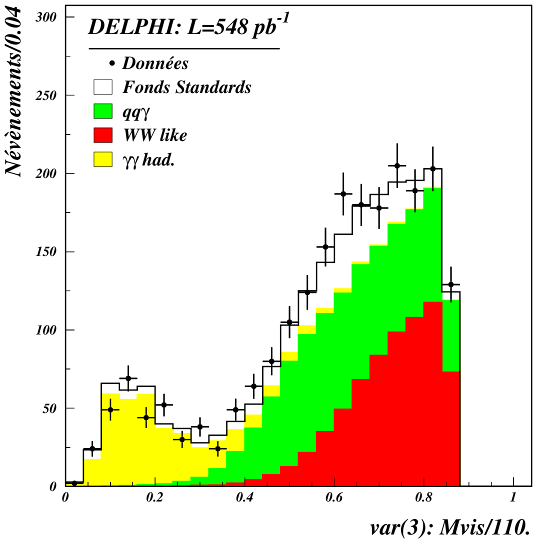
2000 S1 data

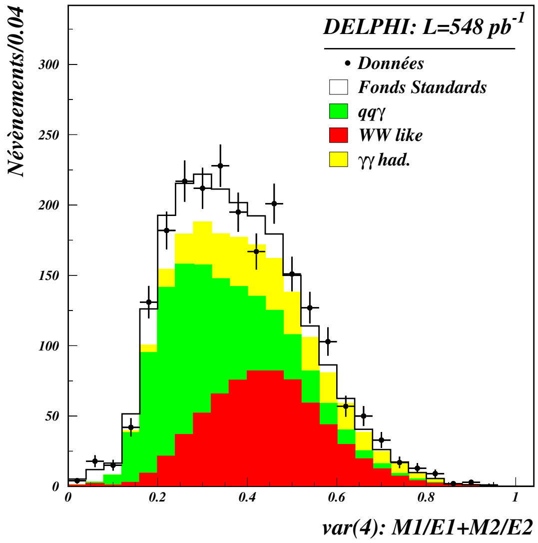

2000 S1: L=61 pb-1
• Données
Fonds Standards
qqγ
WW like
γγ had.
Signal t̃
Signal b̃
Névènements/4
Energie Visible (GeV)
Energie chargée (GeV)
Masse Visible (GeV/c2)
Névènements/1
N. Particules
Névènements/0.25
Btag.: Prob(z0)
Acoplanarité (degrés)

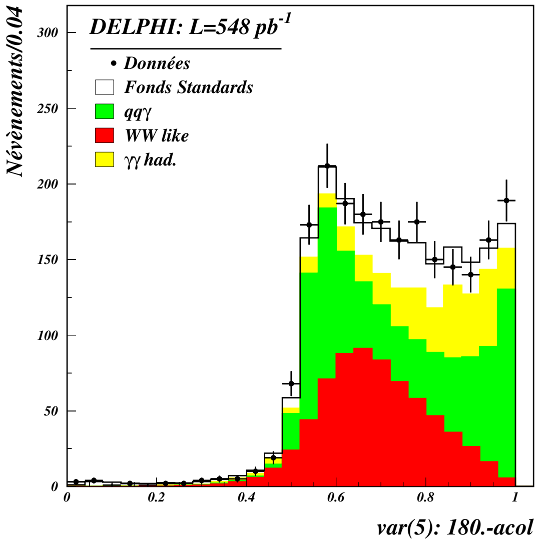
LEP2 data


DELPHI: L=548 pb-1
• Données
Fonds Standards
qqγ
WW like
γγ had.
Névènements/0.04
var(1): Pt/Evis

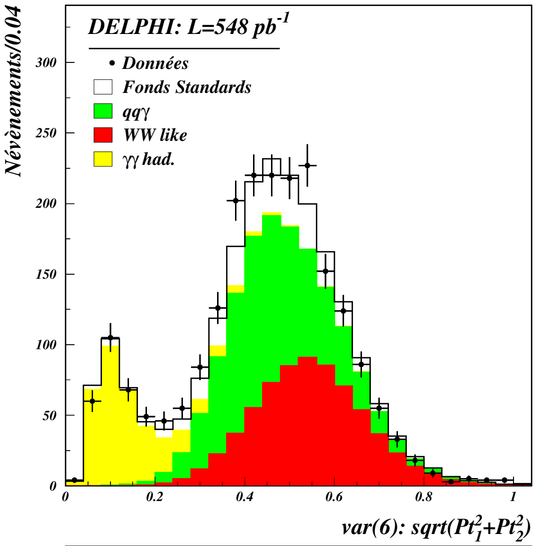

DELPHI: L=548 pb-1
• Données
Fonds Standards
qqγ
WW like
γγ had.
Névènements/0.04
var(2): Et/Ecm

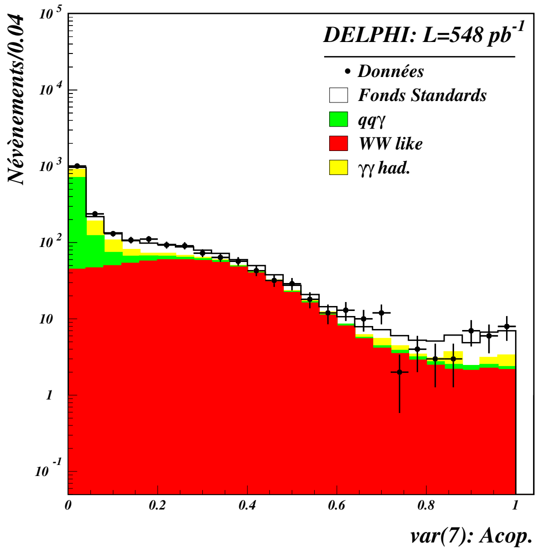

DELPHI: L=548 pb-1
• Données
Fonds Standards
qqγ
WW like
γγ had.
Névènements/0.04
var(3): Mvis/110.

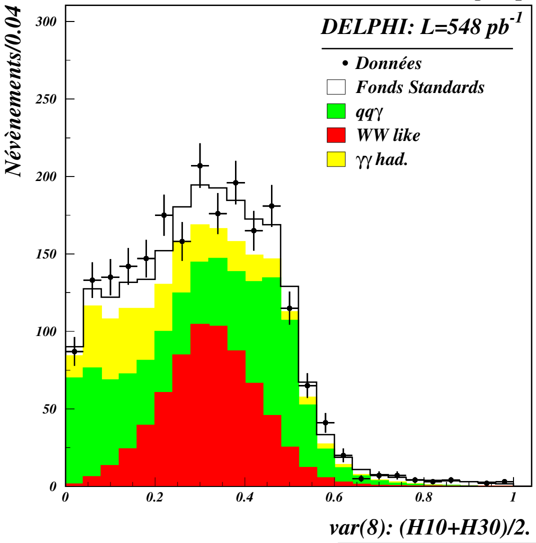

DELPHI: L=548 pb-1
• Données
Fonds Standards
qqγ
WW like
γγ had.
Névènements/0.04
var(4): M1/E1+M2/E2

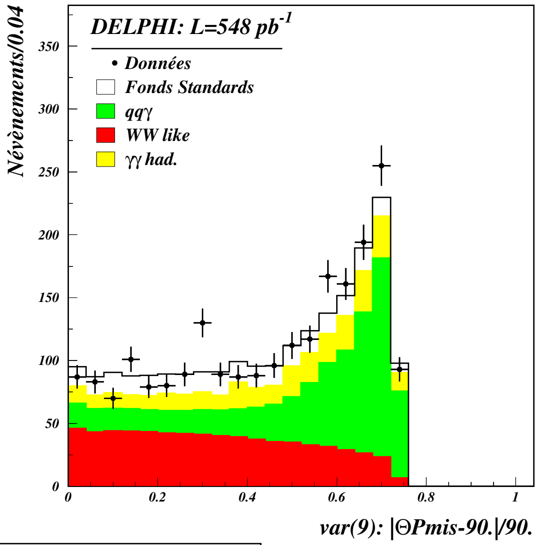

DELPHI: L=548 pb-1
• Données
Fonds Standards
qqγ
WW like
γγ had.
Névènements/0.04
var(5): 180.-acol

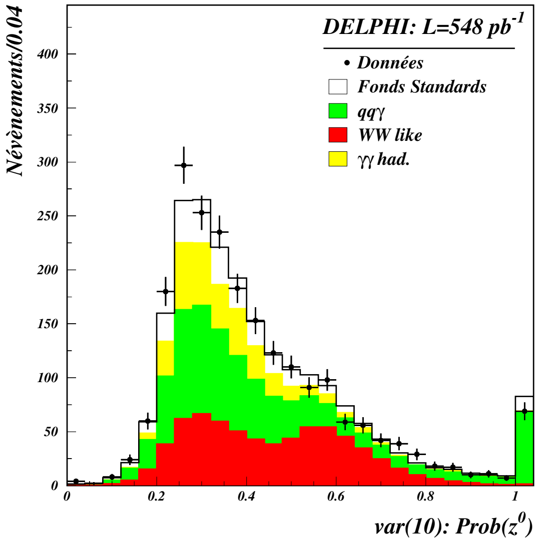
LEP2 data


DELPHI: L=548 pb^{-1}
• Données
Fonds Standards
qqγ
WW like
γγ had.
Névènements/0.04
var(6): sqrt(Pt$_1^2$+Pt$_2^2$)

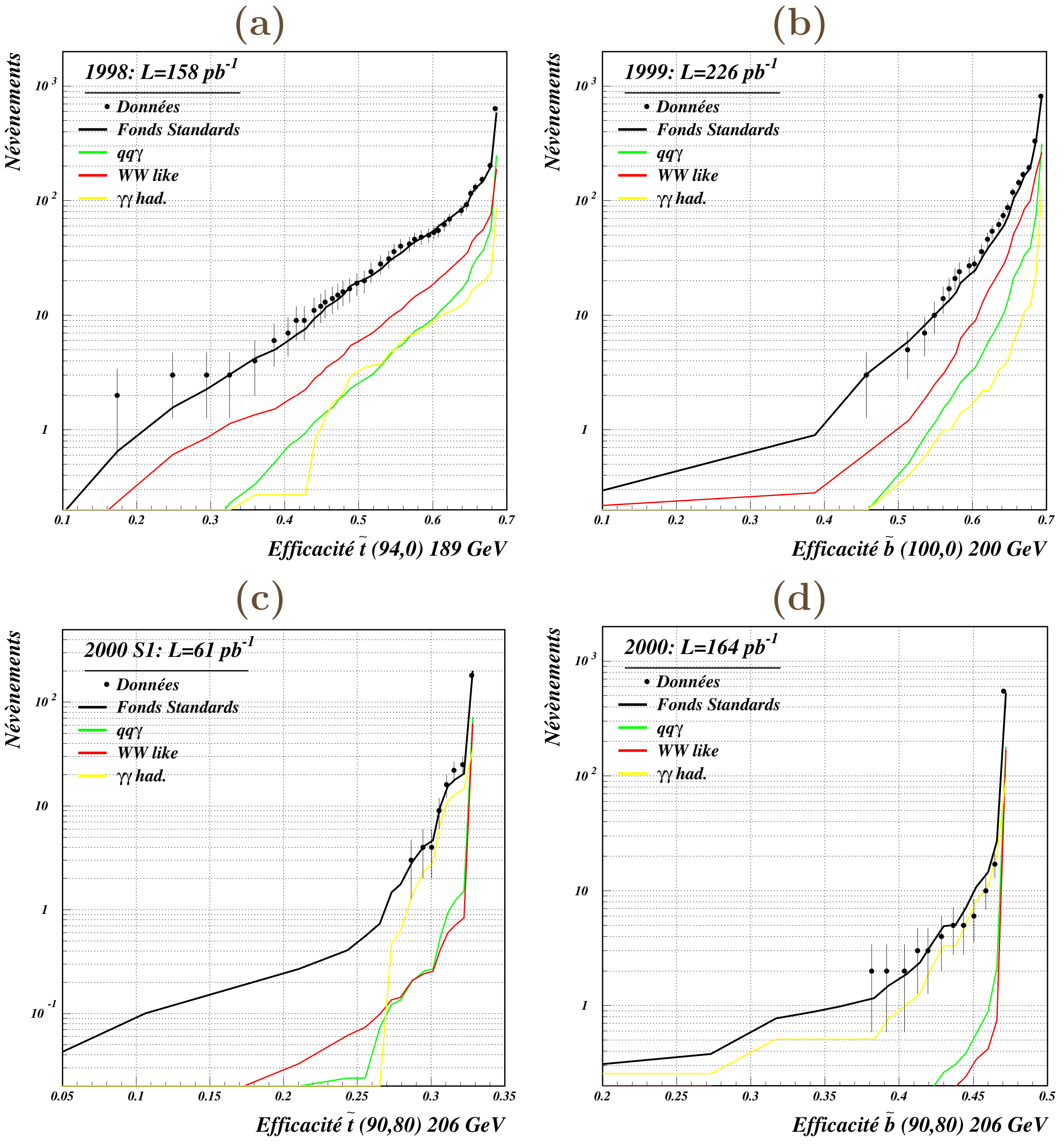

DELPHI: L=548 pb^{-1}
• Données
Fonds Standards
qqγ
WW like
γγ had.
Névènements/0.04
var(7): Acop.


DELPHI: L=548 pb^{-1}
• Données
Fonds Standards
qqγ
WW like
γγ had.
Névènements/0.04
var(8): (H10+H30)/2.


DELPHI: L=548 pb^{-1}
• Données
Fonds Standards
qqγ
WW like
γγ had.
Névènements/0.04
var(9): |ΘPmis-90.|/90.


DELPHI: L=548 pb^{-1}
• Données
Fonds Standards
qqγ
WW like
γγ had.
Névènements/0.04
var(10): Prob(z^0)

LEP2 data


(a)
1998: L=158 pb⁻¹
Données
Fonds Standards
qqγ
WW like
γγ had.
Névènements
Efficacité t̃ (94,0) 189 GeV
(b)
1999: L=226 pb⁻¹
Données
Fonds Standards
qqγ
WW like
γγ had.
Névènements
Efficacité b̃ (100,0) 200 GeV
(c)
2000 S1: L=61 pb⁻¹
Données
Fonds Standards
qqγ
WW like
γγ had.
Névènements
Efficacité t̃ (90,80) 206 GeV
(d)
2000: L=164 pb⁻¹
Données
Fonds Standards
qqγ
WW like
γγ had.
Névènements
Efficacité b̃ (90,80) 206 GeV

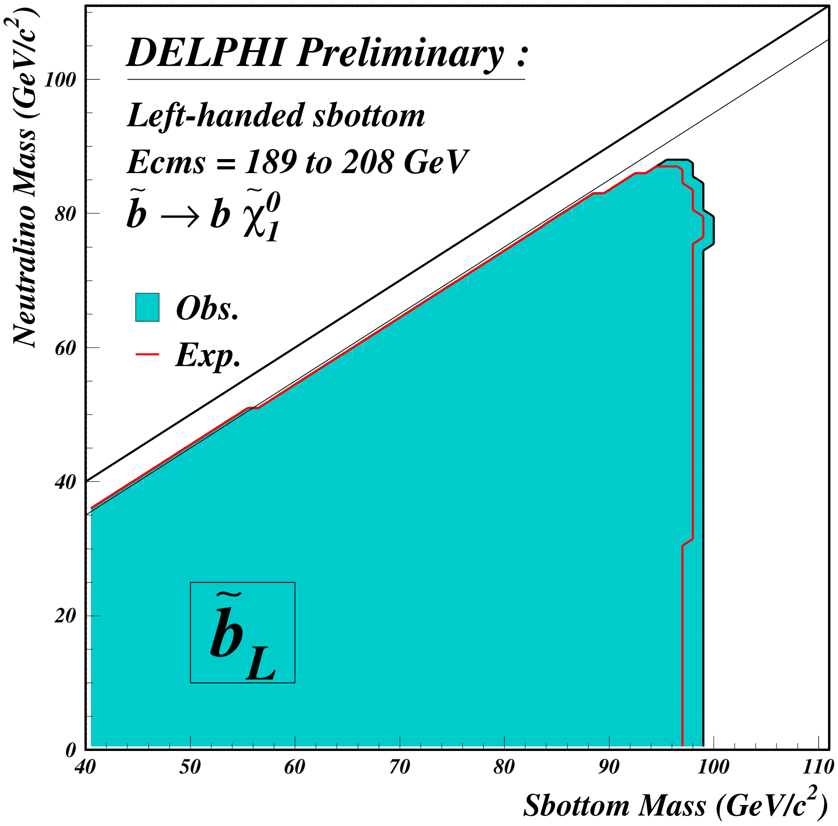
Results

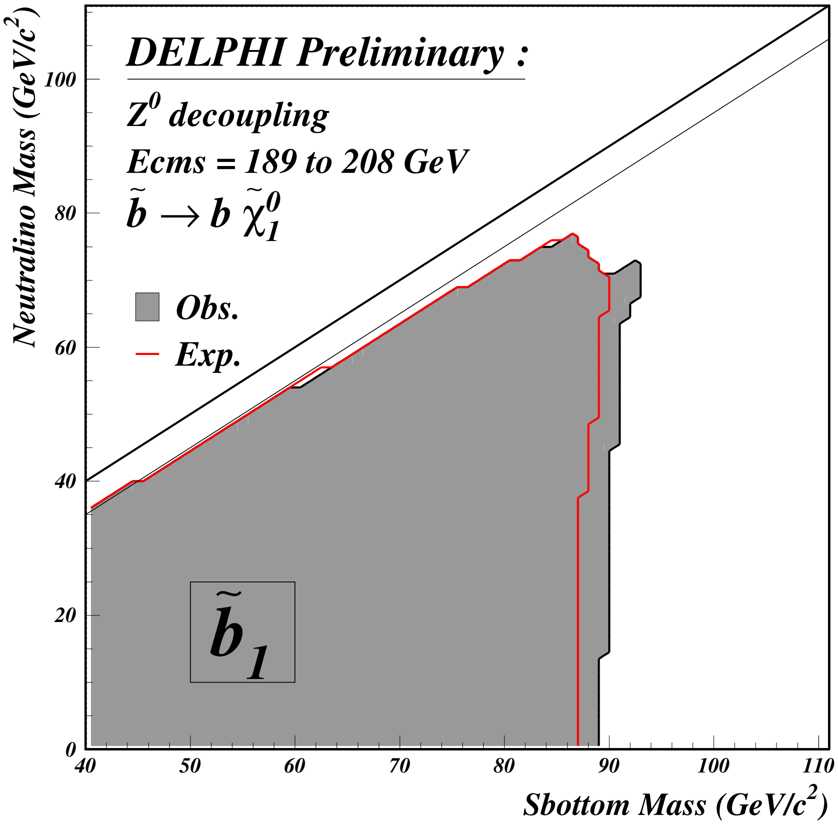
Analyse Sbottom				
	$\Delta M \geq 20GeV/c^2$		$\Delta M < 20GeV/c^2$	
	Donnés	Simulation	Données	Simulation
188,7	2	$0,43 \pm 0,08^{+0,12}_{-0,03}$	1	$0,47 \pm 0,20^{+0,19}_{-0,05}$
191,6	0	$0,052 \pm 0,009^{+0,02}_{-0,02}$	0	$0,063 \pm 0,024^{+0,01}_{-0,03}$
195,6	0	$0,17 \pm 0,04^{+0,03}_{-0,03}$	1	$0,22 \pm 0,08^{+0,02}_{-0,07}$
199,6	0	$0,14 \pm 0,03^{+0,02}_{-0,03}$	0	$0,27 \pm 0,08^{+0,05}_{-0,3}$
201,7	0	$0,074 \pm 0,02^{+0,03}_{-0,01}$	1	$0,13 \pm 0,04^{+0,04}_{-0,03}$
204,8	0	$0,49 \pm 0,05^{+0,05}_{-0,06}$	0	$0,43 \pm 0,17^{+0,05}_{-0,23}$
206,6	0	$0,36 \pm 0,04^{+0,07}_{-0,03}$	0	$0,38 \pm 0,17^{+0,13}_{-0,16}$
208,1	0	$0,050 \pm 0,007^{+0,073}_{-0,001}$	0	$0,037 \pm 0,017^{+0,063}_{-0,008}$
206,6 S1	0	$0,33 \pm 0,04^{+0,01}_{-0,10}$	0	$0,12 \pm 0,03^{+0,02}_{-0,05}$
Total	2	$2,1 \pm 0,12^{+0,17}_{-0,13}$	3	$2,12 \pm 0,34^{+0,25}_{-0,42}$

Analyse Stop				
	$\Delta M \geq 20GeV/c^2$		$\Delta M < 20GeV/c^2$	
	Donnés	Simulation	Données	Simulation
188,7	3	$2,28 \pm 0,22^{+0,78}_{-0,01}$	3	$0,87 \pm 0,21^{+0,28}_{-0,02}$
191,6	2	$0,92 \pm 0,11^{+0,17}_{-0,40}$	0	$0,27 \pm 0,07^{+0,01}_{-0,10}$
195,6	0	$2,35 \pm 0,22^{+0,34}_{-0,24}$	3	$0,78 \pm 0,15^{+0,08}_{-0,20}$
199,6	1	$2,14 \pm 0,13^{+0,07}_{-0,39}$	0	$0,91 \pm 0,16^{+0,13}_{-0,11}$
201,7	1	$1,16 \pm 0,07^{+0,49}_{-0,12}$	0	$0,49 \pm 0,08^{+0,18}_{-0,12}$
204,8	5	$2,00 \pm 0,11^{+0,34}_{-0,28}$	0	$0,75 \pm 0,18^{+0,07}_{-0,42}$
206,6	1	$2,32 \pm 0,11^{+0,43}_{-0,10}$	1	$0,78 \pm 0,18^{+0,16}_{-0,27}$
208,1	0	$0,19 \pm 0,01^{+0,26}_{-0,01}$	0	$0,076 \pm 0,018^{+0,14}_{-0,003}$
206,6 S1	1	$2,67 \pm 0,11^{+0,01}_{-0,89}$	0	$0,41 \pm 0,04^{+0,03}_{-0,18}$
Total	14	$16,03 \pm 0,41^{+1,2}_{-1,1}$	7	$5,34 \pm 0,41^{+0,43}_{-0,60}$

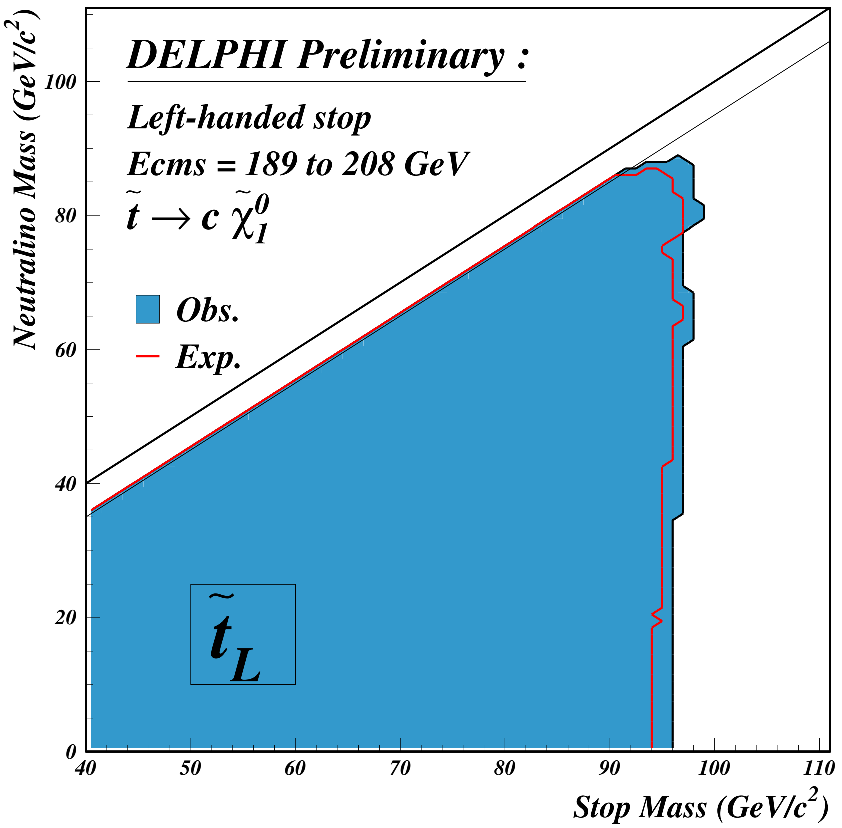
Table 2:

Results

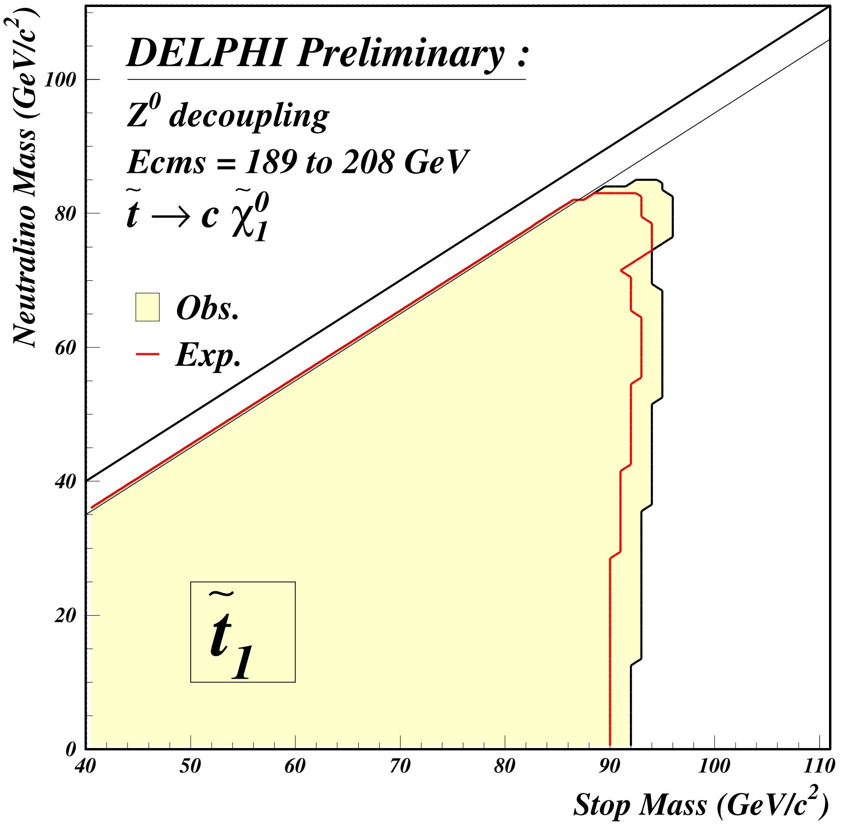

DELPHI Preliminary :
Left-handed sbottom
Ecms = 189 to 208 GeV
$\tilde{b} \rightarrow b\, \tilde{\chi}^0_1$
Obs.
Exp.
$\tilde{b}_L$
Neutralino Mass (GeV/c^2)
Sbottom Mass (GeV/c^2)


DELPHI Preliminary :
Z^0 decoupling
Ecms = 189 to 208 GeV
$\tilde{b} \rightarrow b\, \tilde{\chi}^0_1$
Obs.
Exp.
$\tilde{b}_1$
Neutralino Mass (GeV/c^2)
Sbottom Mass (GeV/c^2)

Results



DELPHI Preliminary :
Left-handed stop
Ecms = 189 to 208 GeV
$\tilde{t} \rightarrow c\ \tilde{\chi}^0_1$
Obs.
Exp.
$\tilde{t}_L$
Neutralino Mass (GeV/c^2)
Stop Mass (GeV/c^2)
0
20
40
60
80
100
40
50
60
70
80
90
100
110



DELPHI Preliminary :
Z^0 decoupling
Ecms = 189 to 208 GeV
$\tilde{t} \rightarrow c\ \tilde{\chi}^0_1$
Obs.
Exp.
$\tilde{t}_1$
Neutralino Mass (GeV/c^2)
Stop Mass (GeV/c^2)
0
20
40
60
80
100
40
50
60
70
80
90
100
110

Results

- **Limites en masse:**

	Sbottom		Stop	
	$\theta_{\tilde{b}}=0$	$\theta_{\tilde{b}}=68$	$\theta_{\tilde{t}}=0$	$\theta_{\tilde{t}}=56$
$\mathbf{\Delta M \geq 7}$	93	76	95	91
$\mathbf{\Delta M \geq 10}$	98	87	96	92
$\mathbf{\Delta M \geq 15}$	99	89	96	92

Table 3: