DELPHI week, June 2001
Presented by: S. Ask

Search for charginos

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- News for the final 2000 C1 selection
  - → Candidates
  - → Improvement with new selection
- Results for the 2000 S1 processing
  - → Difference from C1
  - → Candidates
  - → Data-Monte Carlo agreement at final level
- The limits
- Conclusion

Changes since the Moriond contribution

- The Lr-selection has been redone for all the windows

  Optimisation for $E_{CM} = 206$ GeV

  Using the the last version of the Likelihood-ratio software

A complete review of 2000 data will be given at the coming DELPHI week in Greece

Topology:	j ℓ	$\ell\ell$	jj	rad	TOTAL
	$3 \leq \Delta M < 5$ GeV/c^2				
N data:	0	20	5	3	28
N backg:	$0.44\ ^{+3.307}_{-0.070}$	$21.26\ ^{+4.050}_{-1.642}$	$7.49\ ^{+3.468}_{-0.780}$	$2.48\ ^{+3.349}_{-0.232}$	$31.67\ ^{+7.113}_{-1.834}$
	$5 \leq \Delta M < 10$ GeV/c^2				
N data:	0	0	9	3	12
N backg:	$0.44\ ^{+3.307}_{-0.070}$	$2.02\ ^{+3.372}_{-0.361}$	$12.92\ ^{+3.572}_{-1.088}$	$2.48\ ^{+3.349}_{-0.232}$	$17.86\ ^{+6.803}_{-1.172}$
	$10 \leq \Delta M < 25$ GeV/c^2				
N data:	1	8	8	3	20
N backg:	$0.69\ ^{+3.309}_{-0.079}$	$7.75\ ^{+3.519}_{-0.597}$	$13.71\ ^{+3.532}_{-0.975}$	$2.48\ ^{+3.349}_{-0.232}$	$24.64\ ^{+6.857}_{-1.169}$
	$25 \leq \Delta M < 35$ GeV/c^2				
N data:	1	18	3	3	25
N backg:	$0.37\ ^{+3.296}_{-0.043}$	$15.34\ ^{+3.600}_{-0.762}$	$4.00\ ^{+3.342}_{-0.359}$	$2.48\ ^{+3.349}_{-0.232}$	$22.19\ ^{+6.798}_{-0.875}$
	$35 \leq \Delta M < 50$ GeV/c^2				
N data:	2	28	10	10	50
N backg:	$2.51\ ^{+3.328}_{-0.174}$	$31.11\ ^{+3.674}_{-0.951}$	$8.03\ ^{+3.349}_{-0.411}$	$10.28\ ^{+3.343}_{-0.452}$	$51.92\ ^{+6.854}_{-1.143}$
	50 GeV/$c^2 \leq \Delta M$				
N data:	3	48	22	10	83
N backg:	$4.75\ ^{+3.343}_{-0.254}$	$45.36\ ^{+3.644}_{-0.944}$	$18.67\ ^{+3.385}_{-0.584}$	$10.28\ ^{+3.343}_{-0.452}$	$79.06\ ^{+6.862}_{-1.225}$
	TOTAL (logical .OR. between different ΔM windows)				
N data:	3	76	33	10	122
N backg:	$5.04\ ^{+3.355}_{-0.263}$	$69.74\ ^{+4.373}_{-2.070}$	$33.82\ ^{+3.668}_{-1.324}$	$10.87\ ^{+3.384}_{-0.469}$	$119.47\ ^{+7.436}_{-2.515}$

Improvement for 2000 C1 processing with new selection with respect to expected excluded cross section

Non-radiative points

$3 \leq \Delta M < 5$ GeV/c^2	$\Rightarrow$ 4.2%
$5 \leq \Delta M < 10$ GeV/c^2	$\Rightarrow$ 15.9%
$10 \leq \Delta M < 25$ GeV/c^2	$\Rightarrow$ 11.7%
$25 \leq \Delta M < 35$ GeV/c^2	$\Rightarrow$ 19.4%
$35 \leq \Delta M < 50$ GeV/c^2	$\Rightarrow$ 14.2%
$50 \leq \Delta M$ GeV/c^2	$\Rightarrow$ 20.8%

Radiative points

$10 \leq \Delta M < 25$ GeV/c^2	$\Rightarrow$ 35.3%
$25 \leq \Delta M < 35$ GeV/c^2	$\Rightarrow$ 26.4%
$35 \leq \Delta M < 50$ GeV/c^2	$\Rightarrow$ 15.0%
$50 \leq \Delta M$ GeV/c^2	$\Rightarrow$ 20.6%

- Dead sector 6 included in the simulation

- The Lr-selection has been redone for all the windows

  Optimisation for $E_{CM} = 207$ GeV

  Using the the last version of the Likelihood-ratio software

Difference between 2000 C1 and S1 processing with respect to expected excluded cross section

Non-radiative points

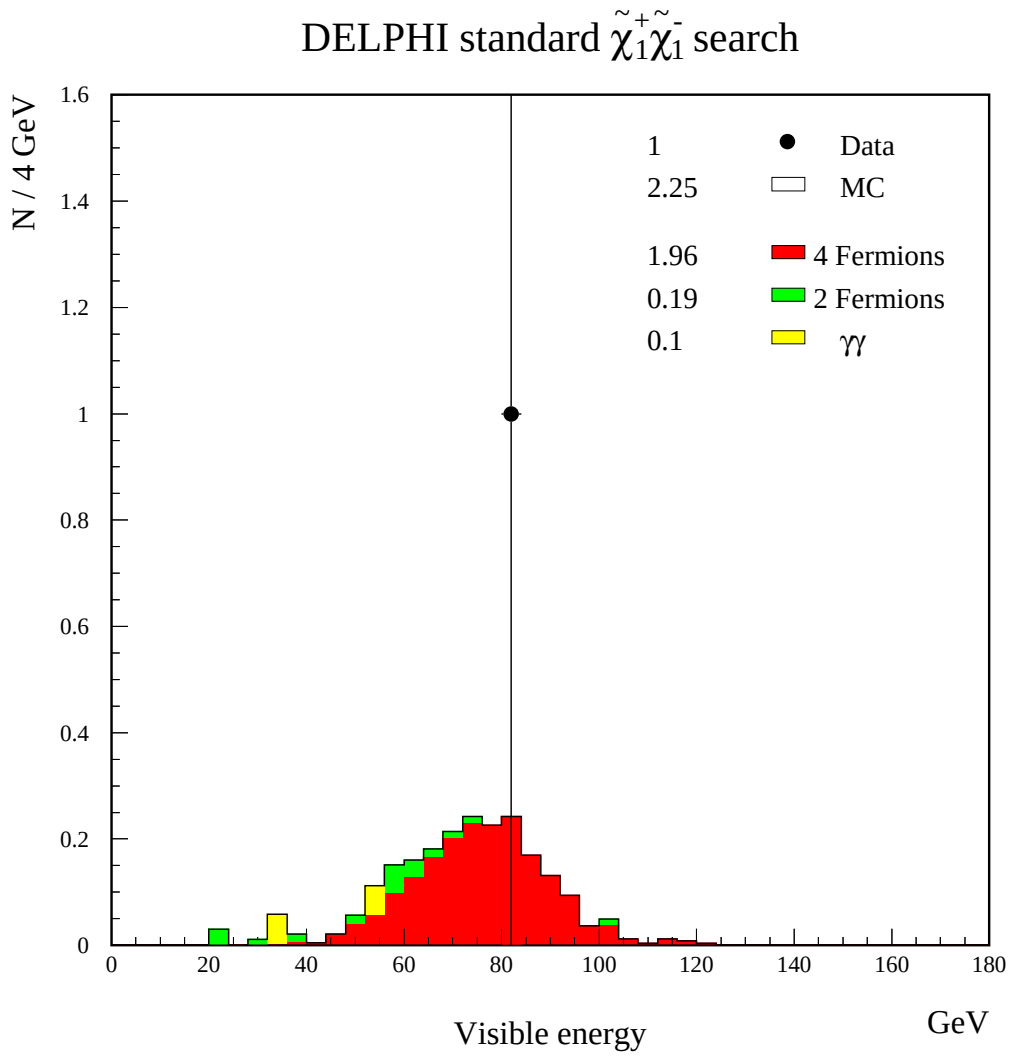
$3 \leq \Delta M < 5$ GeV/c^2	$\Rightarrow$ 4.9%
$5 \leq \Delta M < 10$ GeV/c^2	$\Rightarrow$ 5.4%
$10 \leq \Delta M < 25$ GeV/c^2	$\Rightarrow$ 3.8%
$25 \leq \Delta M < 35$ GeV/c^2	$\Rightarrow$ 3.8%
$35 \leq \Delta M < 50$ GeV/c^2	$\Rightarrow$ 8.4%
$50 \leq \Delta M$ GeV/c^2	$\Rightarrow$ 5.7%

Radiative points

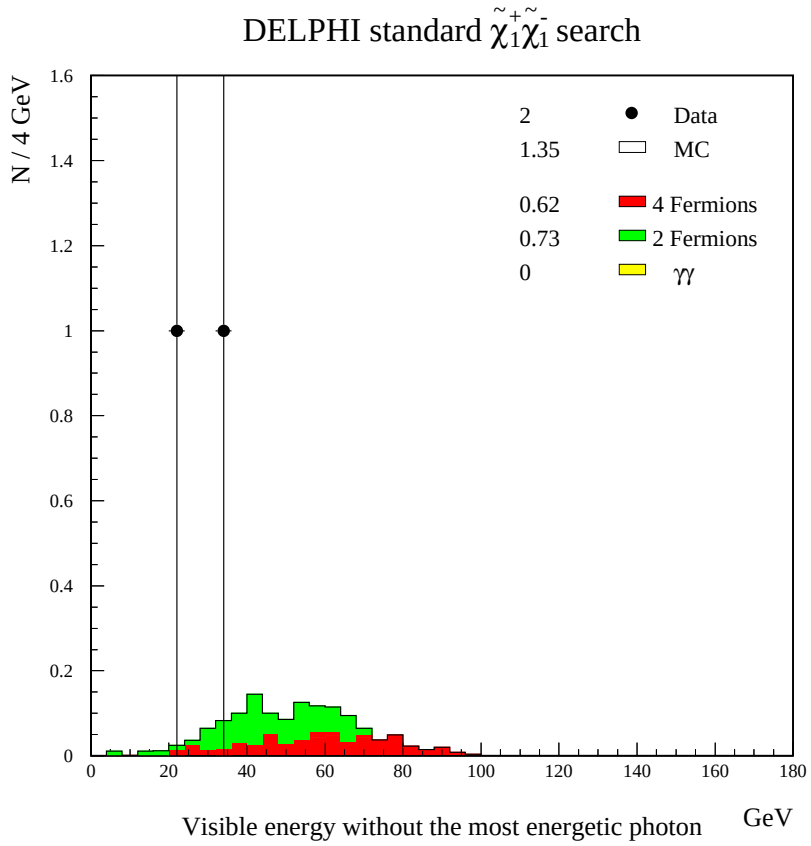
$10 \leq \Delta M < 25$ GeV/c^2	$\Rightarrow$ 7.6%
$25 \leq \Delta M < 35$ GeV/c^2	$\Rightarrow$ 6.5%
$35 \leq \Delta M < 50$ GeV/c^2	$\Rightarrow$ 10.8%
$50 \leq \Delta M$ GeV/c^2	$\Rightarrow$ 4.6%

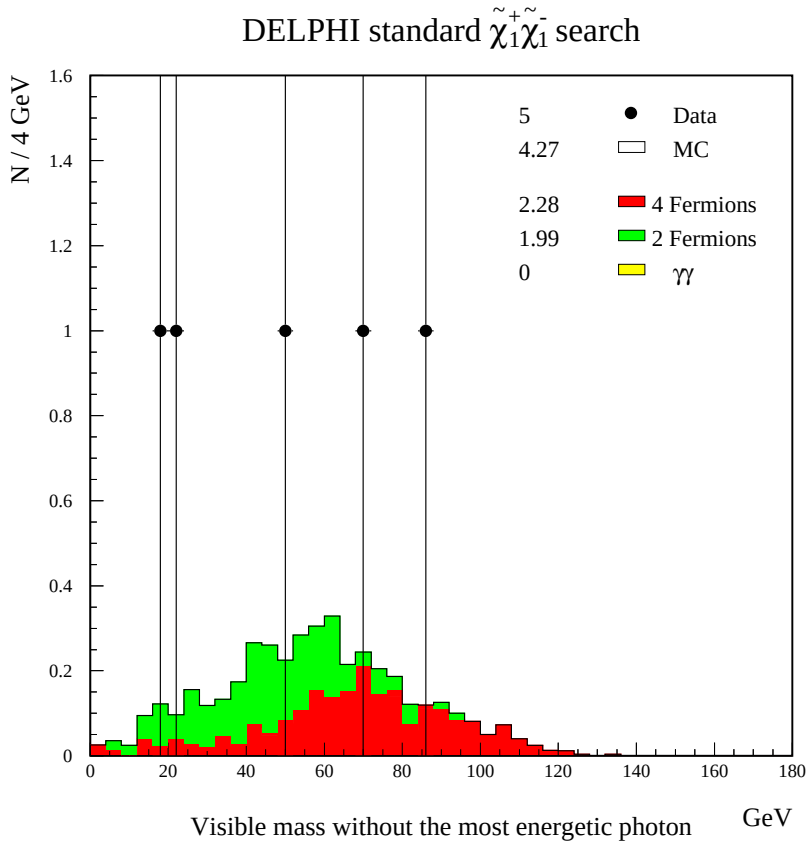
Topology:	j ℓ	$\ell\ell$	jj	rad	TOTAL
	$3 \leq \Delta M < 5$ GeV/c^2				
N data:	0	12	2	2	16
N backg:	$0.20\ ^{+0.450}_{-0.037}$	$20.77\ ^{+1.560}_{-1.161}$	$2.13\ ^{+0.773}_{-0.380}$	$1.35\ ^{+0.455}_{-0.091}$	$24.45\ ^{+1.854}_{-1.226}$
	$5 \leq \Delta M < 10$ GeV/c^2				
N data:	0	4	4	2	10
N backg:	$0.20\ ^{+0.450}_{-0.037}$	$3.64\ ^{+0.809}_{-0.392}$	$3.90\ ^{+0.969}_{-0.591}$	$1.35\ ^{+0.455}_{-0.091}$	$9.10\ ^{+1.416}_{-0.716}$
	$10 \leq \Delta M < 25$ GeV/c^2				
N data:	0	3	8	2	13
N backg:	$0.49\ ^{+0.458}_{-0.059}$	$2.31\ ^{+0.622}_{-0.185}$	$7.46\ ^{+1.086}_{-0.717}$	$1.35\ ^{+0.455}_{-0.091}$	$11.62\ ^{+1.408}_{-0.749}$
	$25 \leq \Delta M < 35$ GeV/c^2				
N data:	0	5	4	2	11
N backg:	$0.39\ ^{+0.452}_{-0.044}$	$6.21\ ^{+0.693}_{-0.278}$	$3.22\ ^{+0.708}_{-0.317}$	$1.35\ ^{+0.455}_{-0.091}$	$11.16\ ^{+1.181}_{-0.434}$
	$35 \leq \Delta M < 50$ GeV/c^2				
N data:	0	12	6	5	23
N backg:	$0.86\ ^{+0.455}_{-0.062}$	$12.63\ ^{+0.758}_{-0.364}$	$4.96\ ^{+0.643}_{-0.253}$	$4.27\ ^{+0.487}_{-0.171}$	$22.72\ ^{+1.197}_{-0.479}$
	50 GeV/$c^2 \leq \Delta M$				
N data:	1	20	10	5	36
N backg:	$2.25\ ^{+0.463}_{-0.096}$	$17.34\ ^{+0.741}_{-0.369}$	$6.90\ ^{+0.650}_{-0.268}$	$4.27\ ^{+0.487}_{-0.171}$	$30.76\ ^{+1.193}_{-0.497}$
	TOTAL (logical .OR. between different ΔM windows)				
N data:	1	31	16	5	53
N backg:	$2.34\ ^{+0.468}_{-0.104}$	$38.77\ ^{+1.653}_{-1.249}$	$13.08\ ^{+1.200}_{-0.835}$	$4.48\ ^{+0.489}_{-0.176}$	$58.67\ ^{+2.151}_{-1.517}$

Candidates 207 S1, jl 6

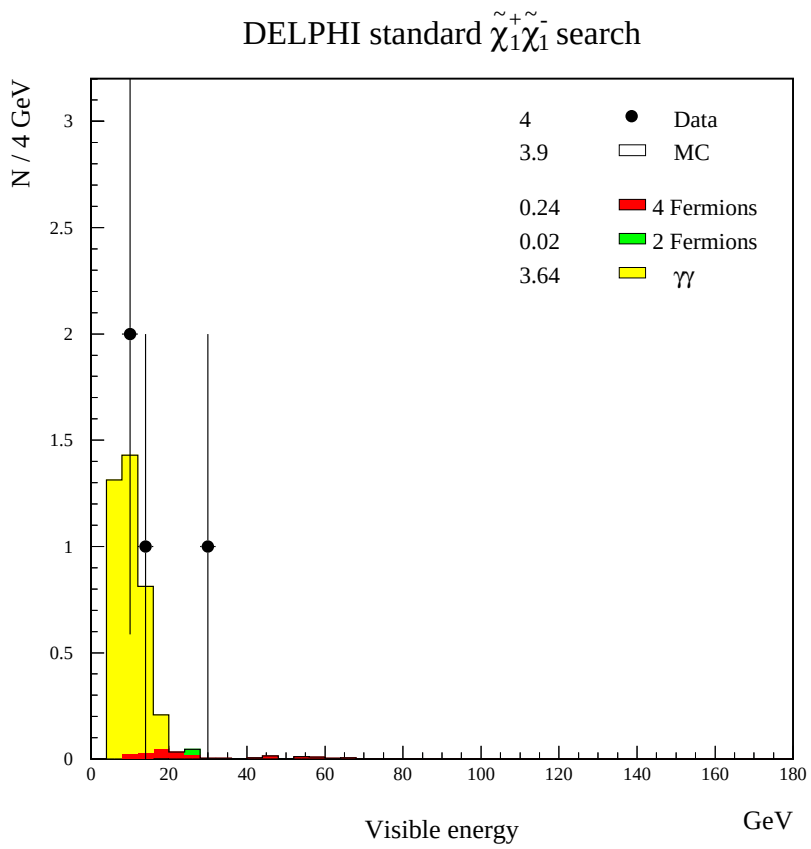


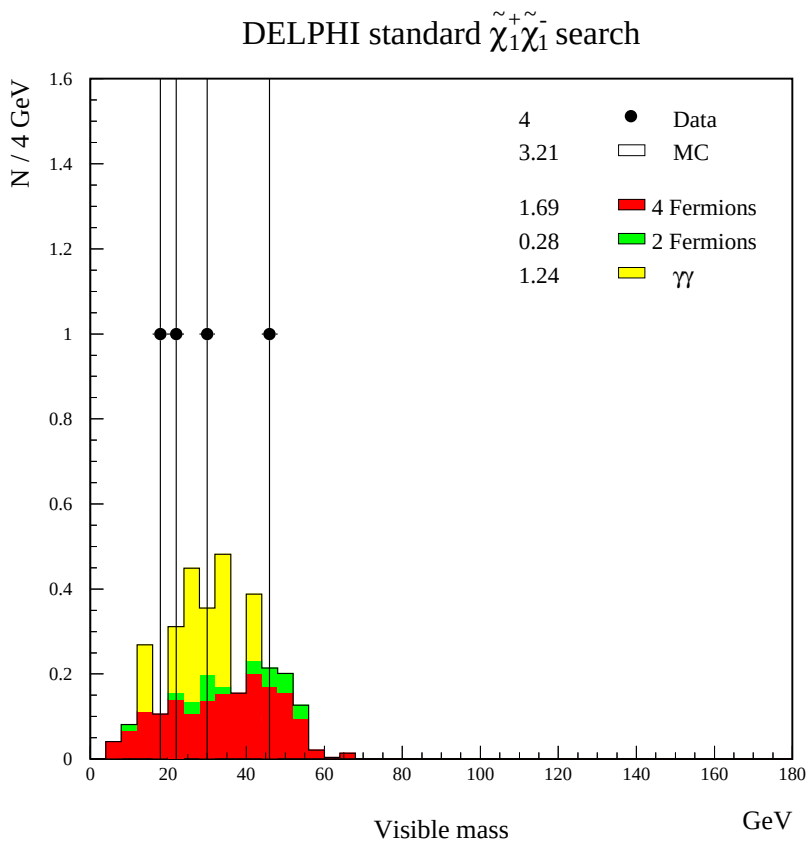
Candidates 207 S1, Rad 1-4 & 5-6



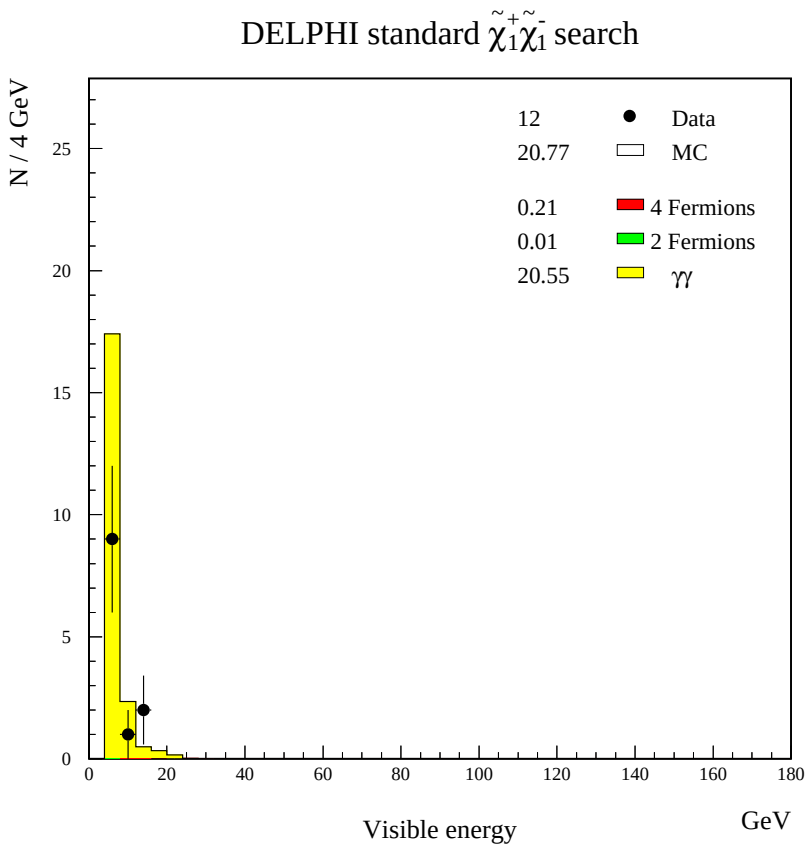


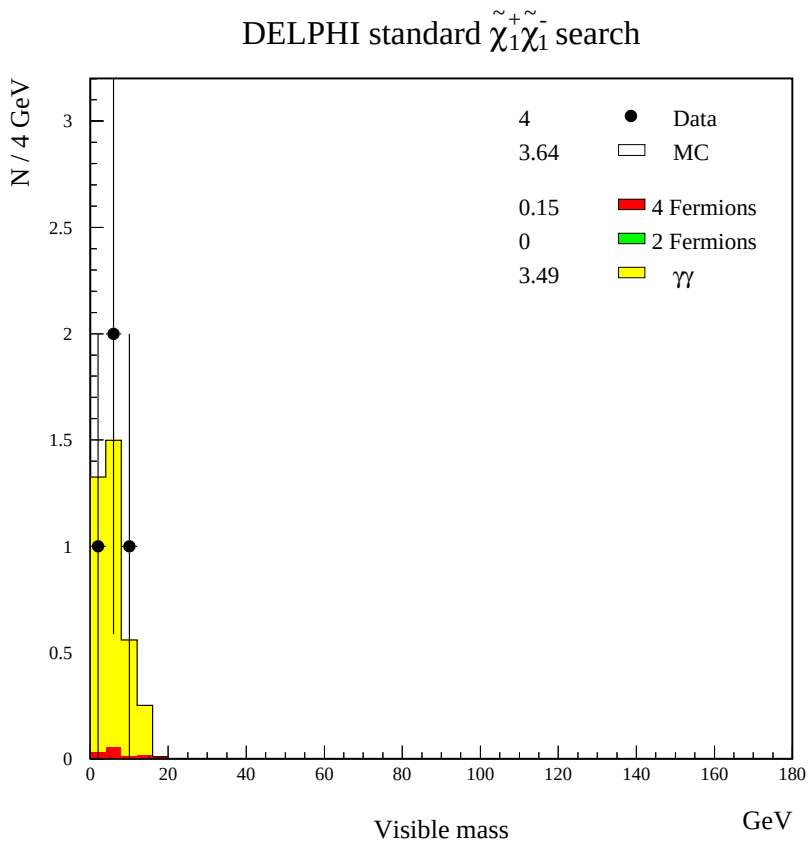
Candidates 207 S1, jj 2 & 4





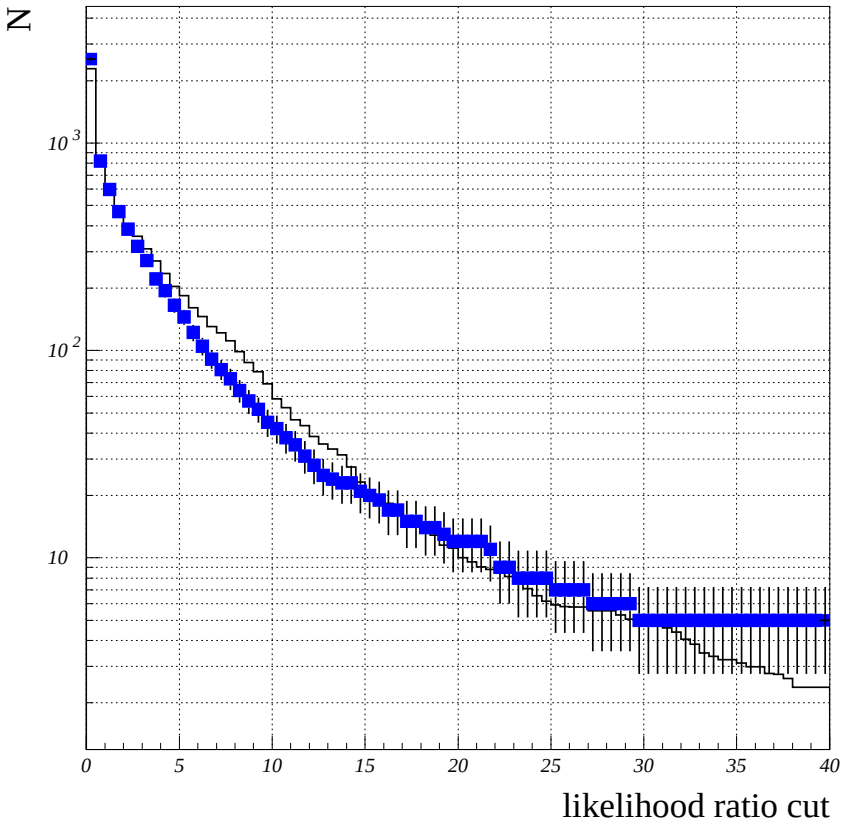
Candidates 207 S1, $\ell\ell$ 1 & 2



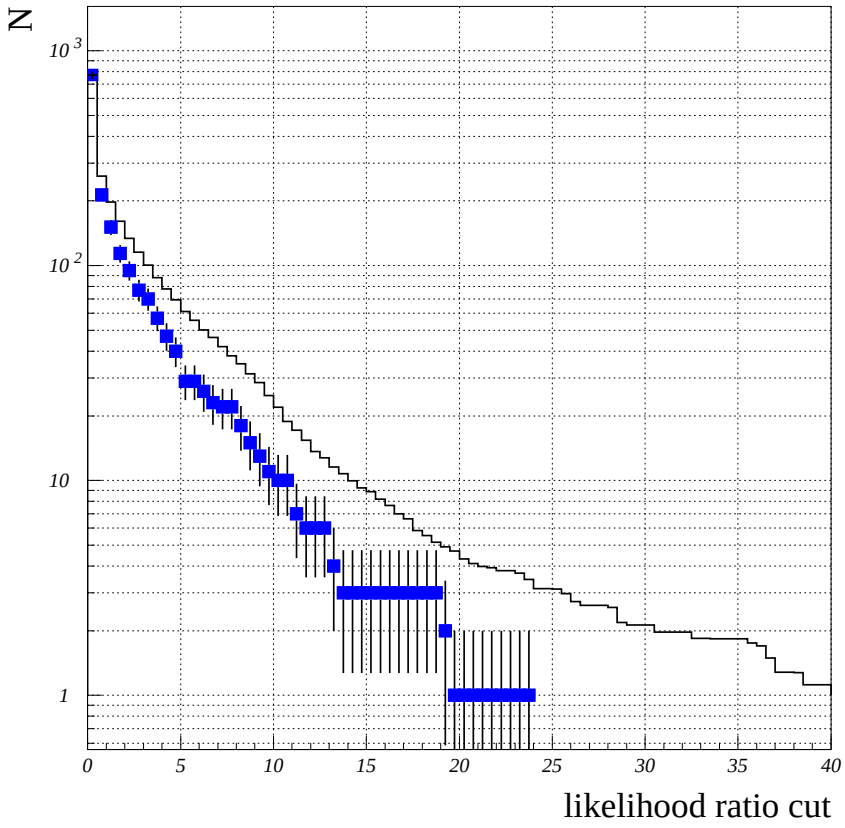


The $\ell\ell$ 1 problem

ll topology - ΔM region 1 - Ecm = 206 GeV

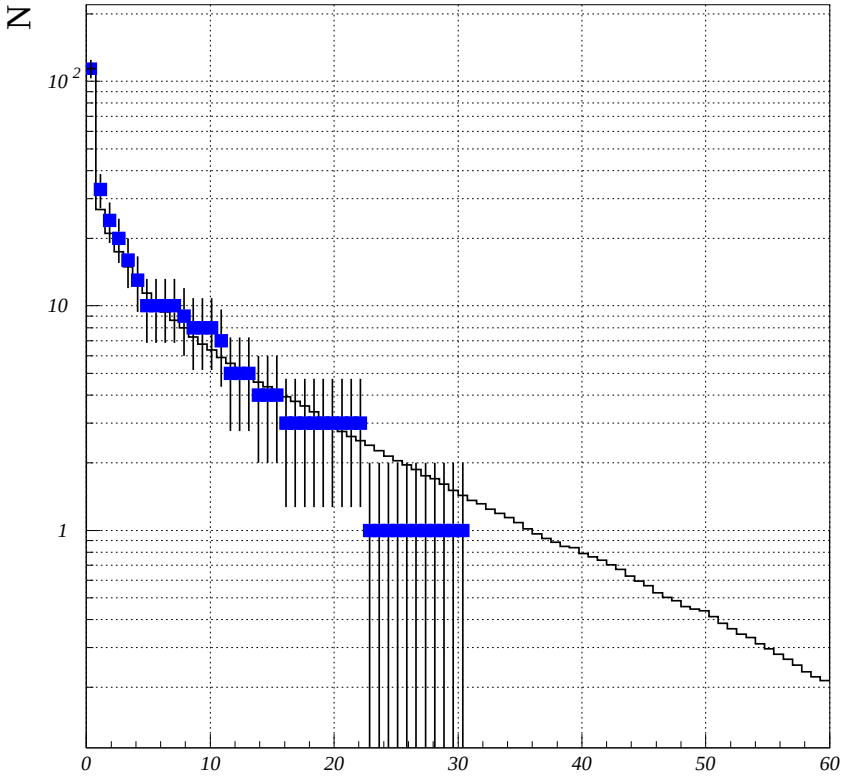


ll topology - ΔM region 1 - Ecm = 207 GeV

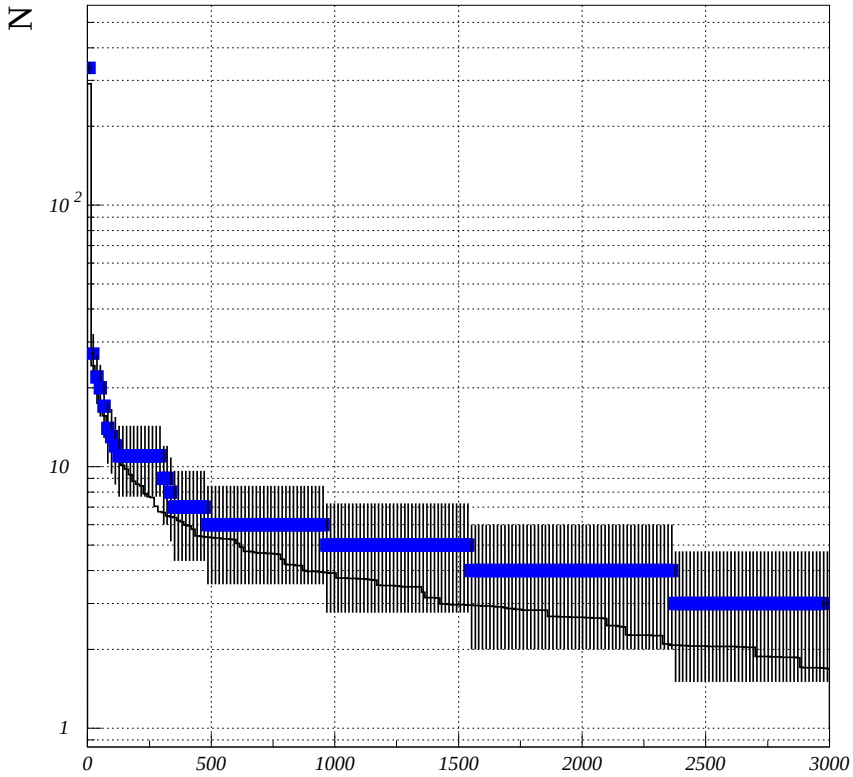


Data-Monte Carlo at Lr-level

ll topology - ΔM region 6 - Ecm = 207 GeV

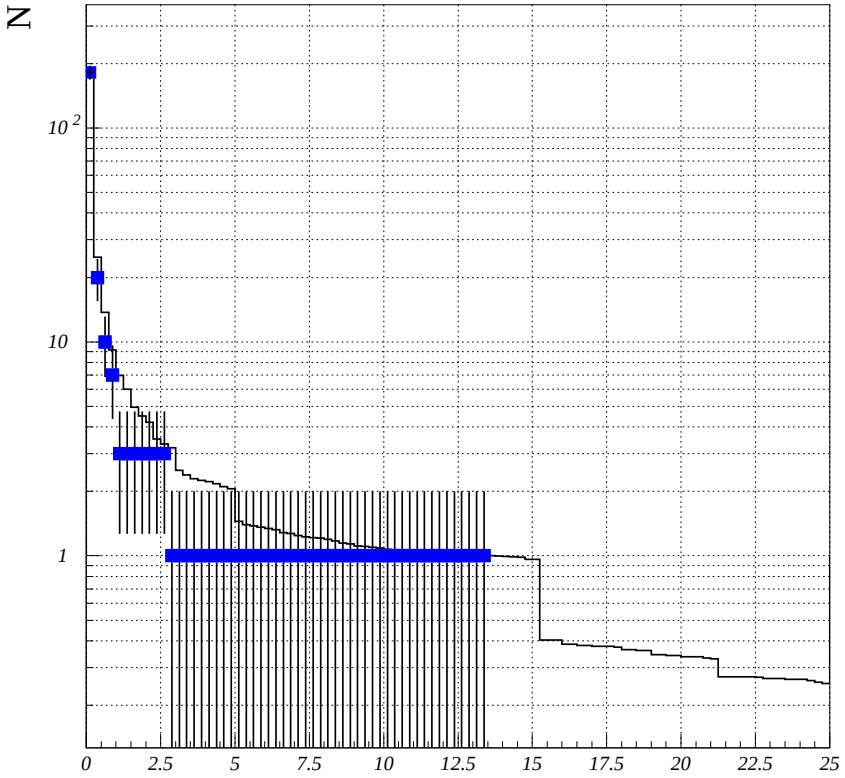


jj topology - ΔM region 3 - Ecm = 207 GeV

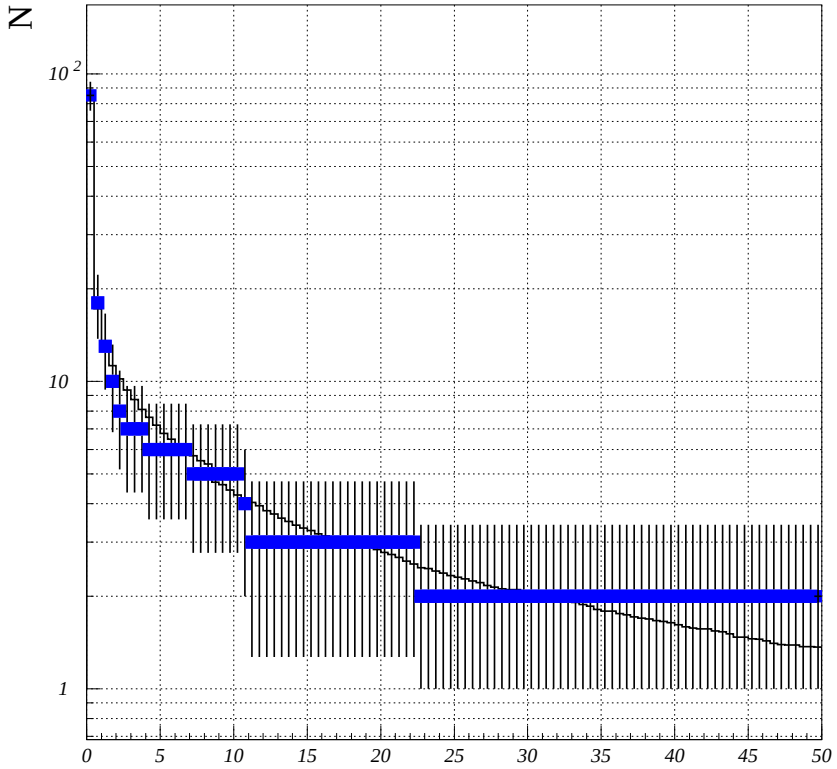


Data-Monte Carlo at Lr-level

jl topology - ΔM region 4 - Ecm = 207 GeV



gg topology - ΔM region 2 - Ecm = 207 GeV



Limits will be computed with old software

→ New Lr-functions, 99 00c1 00s1

→ Including S1 data

When new limit software is ready

→ Real E_{CM} values

→ Combination of different E_{CM}
(multichannel approach)

- The optimisation for 2000 data gave better results, with respect to the expected excluded cross section, for all the windows

- The results from the S1 processing are in general satisfactory with respect to data-Monte Carlo agreement

  → Still a problem in the low multiplicity degenerate region

  → More leptonic gamma-gamma Monte Carlo needed (on its way)

A lot of the work is done and a complete review will be given, including systematics and limits with new limit software, at the coming DELPHI week in Greece